SELECT COMMITTEE ON THE ARCTIC

Oral and written evidence

Contents

Anglo American and London Mining plc – Oral evidence (QQ 203 – 213) .............................................. 6

Arctic Methane Emergency Group (AMEG) – Written evidence (ARC0055) .................. 26

Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172) .......................................................................................................................... 32

Arctic Advisory Group – Written evidence (ARC0060) .............................................................. 70

Arctic Athabaskan Council – Written evidence (ARC0014) ......................................................... 76

Dr. Sheldon Bacon, Dr. Ed Hawkins and Professor Chris Rapley – Oral evidence (QQ 16 – 28) ........................................................................................................................................ 78

Dr. Sheldon Bacon, Dr. Ed Hawkins and Professor Chris Rapley – Supplementary written evidence (ARC0013) .................................................................................................................. 106

Dr. Sheldon Bacon, Professor Daniel Feltham, Dr. Ed Hawkins, Professor Andrew Shepherd and Professor Chris Rapley – Supplementary written evidence (ARC0049) ................... 112

Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157) ......................................................................................................................... 114

Professor Michael Bradshaw – Written evidence (ARC0062) ........................................................ 146

British Antarctic Survey (BAS) – Written evidence (ARC0018) ...................................................... 148

British Antarctic Survey, Scott Polar Research Institute, and Scottish Association for Marine Science – Oral evidence (QQ 260 – 272) .................................................................................. 153

Professor Terry V. Callaghan – Written evidence (ARC0030) ....................................................... 180

Professor Alex Calvo – Written evidence (ARC0007) ................................................................. 186

Canadian Polar Commission – Written evidence (ARC0040) .................................................... 188

Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62) ........................................................................................................ 194

Professor Robin Churchill – Written evidence (ARC0038) ......................................................... 218

Clarksons Research Services, International Chamber of Shipping, Manson Oceanographic Consultancy – Oral evidence (QQ 63 – 80) .................................................................................. 222

HE Nicola Clase, HE Pekka Huhtaniemi and Alan Kessel – Oral evidence (QQ 311 – 318) .... 261

Luke Coffey – Written evidence (ARC0017) .................................................................................... 280

Michael Jonathan Dangerfield – Written evidence (ARC0063) .................................................... 286

Duncan Depledge – Written evidence (ARC0011) ........................................................................ 293

HE Else Berit Eikeland and HE Thórdur Aegir Óskarsson – Oral evidence (QQ 273 – 283) .... 298

Embassy of Japan in the United Kingdom – Supplementary written evidence (ARC0069) ... 320

European Commission – Oral evidence (QQ 250 – 259) ............................................................ 344
European Commission – Supplementary written evidence (ARC0064) ........................................... 352
European Policies Research Centre, School of Government and Public Policy, University of Strathclyde – Written evidence (ARC0020) ................................................................. 353
Fednav, Lloyds Register and Sovcomflot Overseas Holding Ltd – Oral evidence (QQ 131 – 141) ................................................................................................................................. 359
Professor Daniel Feltham, Professor Andy Shepherd and Professor Peter Wadhams – evidence (QQ 29 – 36) ........................................................................................................ 386
Professor Daniel Feltham, Dr Sheldon Bacon, Dr Ed Hawkins, and Professor Andrew Shepherd – Supplementary written evidence (ARC0049) ........................................... 409
HE Foo Chi Hsia and HE Keiichi Hayashi – Oral evidence (QQ 302 – 310) ................................. 410
Foreign and Commonwealth Office and Ministry of Defence (Officials) – Oral evidence (QQ 1 – 15) .......................................................................................................................... 430
Foreign and Commonwealth Office – Written evidence (ARC0001) ........................................ 473
Foreign and Commonwealth Office – Supplementary written evidence (ARC0004) .......... 479
Foreign and Commonwealth Office – Further supplementary written evidence (ARC0024) ................................................................. 480
Foreign and Commonwealth Office and Ministry of Defence (Minister and Officials) – Oral evidence (QQ 319 – 330) .................................................................................................. 495
Foreign and Commonwealth Office – Further supplementary written evidence (ARC0072) 538
Alan Gadian – Written evidence (ARC0036) .............................................................................. 540
The Geological Society – Written evidence (ARC0031) ............................................................ 545
Dr Dougal Goodman – Written evidence (ARC0022) ............................................................... 550
Greenpeace – Oral evidence (QQ 173 – 188) ............................................................................... 556
HE Claus Grube – Oral evidence (QQ 284 - 291) ......................................................................... 590
Dr. Ed Hawkins, Dr. Sheldon Bacon, and Professor Chris Rapley – Oral evidence (QQ 16 – 28) ......................................................................................................................... 611
Dr. Ed Hawkins, Dr. Sheldon Bacon and Professor Chris Rapley – Supplementary written evidence (ARC0013) ................................................................. 612
Dr. Ed Hawkins, Professor Daniel Feltham, Dr. Sheldon Bacon and Professor Andrew Shepherd – Supplementary written evidence (ARC0049) ........................................... 613
The Henry Jackson Society – Written evidence (ARC0033) ..................................................... 614
The Henry Jackson Society, the Arctic Advisory Group and the Royal Society – Oral evidence (QQ 158 – 172) ......................................................................................................... 618
The Henry Jackson Society – Supplementary written evidence (ARC0052) ......................... 619
HE Pekka Huhtaniemi, HE Nicola Clase and Alan Kessel – Oral evidence (QQ 311 – 318) .... 621
HE Foo Chi Hsia and HE Keiichi Hayashi – Oral evidence (QQ 302 – 310) .............................. 622
International Association of Oil & Gas Producers – Written evidence (ARC0034) ................ 623
International Association of Oil & Gas Producers – Oral evidence (QQ 189 – 202) ............... 630
Anglo American and London Mining plc – Oral evidence (QQ 203 – 213)

Met Office – Written evidence (ARC0044) ........................................................................................................... 972
Met Office – Supplementary written evidence (ARC0071) ....................................................................................... 974
Ministry of Defence and Foreign and Commonwealth Office (Officials) – Oral evidence (QQ 1 – 15) ................................................................. 976
Ministry of Defence – Written evidence (ARC0002) .............................................................................................. 977
Ministry of Defence – Supplementary written evidence (ARC0073) ................................................................. 978
Ministry of Defence and Foreign and Commonwealth Office (Minister and Officials) – Oral evidence (QQ 319 – 330) ........................................................................ 979
National Centre for Atmospheric Science – Written evidence (ARC0021) ..................................................... 980
National Oceanography Centre – Written evidence (ARC0032) ...................................................................... 984
Natural Environment Research Council – Written evidence (ARC0041) ....................................................... 1000
Natural Environment Research Council (NERC) Arctic Office – Written evidence (ARC0028) .......................... 1004
HE Thórdur Aegir Óskarsson and HE Else Berit Eikeland – Oral evidence (QQ 273 – 283) .............................. 1011
Dr. Richard Powell, Professor Michael Bradshaw, and Professor Frances Wall – Oral evidence (QQ 142 – 157) ........................................................................ 1012
Dr. Richard C. Powell – Supplementary written evidence (ARC0053) .......................................................... 1013
Professor Chris Rapley, Dr. Sheldon Bacon and Dr. Ed Hawkins – Oral evidence (QQ 16 – 28) ...................... 1015
Professor Chris Rapley, Dr. Sheldon Bacon and Dr. Ed Hawkins – Supplementary written evidence (ARC0013) ........................................................................ 1016
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236) .......... 1017
Royal Society – Written evidence (ARC0047) ................................................................................................. 1042
The Royal Society, the Henry Jackson Society, and Arctic Advisory Group – Oral evidence (QQ 158 – 172) ........................................................................ 1046
The Sámi Parliament of Norway – Oral evidence (QQ 116 – 130) ................................................................. 1047
Scott Polar Research Institute, Scottish Association for Marine Science and British Antarctic Survey – Oral evidence (QQ 260 – 272) ........................................................................ 1076
Scottish Association for Marine Science, British Antarctic Survey and Scott Polar Research Institute, – Oral evidence (QQ 260 – 272) ................................................................. 1077
Professor Andy Shepherd, Professor Daniel Feltham and Professor Peter Wadham – Oral evidence (QQ 29 – 36) ........................................................................ 1078
Professor Andrew Shepherd – Written evidence (ARC0045) ................................................................. 1079
Professor Andrew Shepherd, Dr. Sheldon Bacon, Professor Daniel Feltham and Dr. Ed Hawkins – Supplementary written evidence (ARC0049) ........................................................................ 1084
Statoil – Oral evidence (QQ 98 – 115) .................
Anglo American and London Mining plc – Oral evidence (QQ 203 – 213)

Stratton Park Associates – Written evidence (ARC0025) ......................................................... 1103
Sovcomflot Overseas Holding Ltd, Fednav and Lloyds Register – Oral evidence (QQ 131 – 141) ................................................................................................................................. 1105
Professor Damon A.H. Teagle – Written evidence (ARC0029) ............................................... 1106
Dr. Aki Tonami – Written evidence (ARC0008) ................................................................. 1109
Dr. Dmitriy S. Tulupov – Written evidence (ARC0009) ..................................................... 1111
University College London, Institute for Risk and Disaster Reduction – Written evidence (ARC0027) ......................................................................................................................... 1114
Professor Peter Wadhams, Professor Daniel Feltham, and Professor Andy Shepherd – Oral evidence (QQ 29 – 36) ................................................................................................................. 1122
Professor Peter Wadhams – Supplementary written evidence (ARC0006) ......................... 1123
Professor Frances Wall, Professor Michael Bradshaw and Dr Richard Powell – Oral evidence (QQ 142 – 157) ......................................................................................................................... 1125
Professor Frances Wall – Supplementary written evidence (ARC0056) ................................. 1126
Matthew Willis – Written evidence (ARC0043) ........................................................................ 1130
Dr. Nalân Koç and Dr. Jan-Gunnar Winther – Oral evidence (QQ 81 – 97) ......................... 1138
Dr. Richard Wood, Rear Admiral Tom Karsten RN and Roderick Johnson – Oral evidence (QQ 214 – 225) ......................................................................................................................... 1139
World Meteorological Office’s Polar Prediction Project – Written evidence (ARC0026) .... 1140
WWF-UK – Written evidence (ARC0050) ............................................................................. 1142
WWF UK – Oral evidence (QQ 237 – 249) ............................................................................ 1148
Q273 The Chairman: This is the second part of our session today. We are looking at mining. I welcome you, Mr Perras. I understand that Mr Hossie is not available after all, but we are very grateful to you for coming along. You should have a copy of our interests. We will be going through a number of questions that you have seen. At the moment you are clearly the only person who can possibly answer these questions, so I am afraid you are going to have to do all of them.

Claude Perras: I am going to be drilled, am I not?

The Chairman: Perhaps you could introduce yourself and then we will start the session.

Claude Perras: First, thank you for inviting us to this Committee. I apologise on behalf of our CEO, Graham Hossie. We had an emergency at the office this morning, as you may have
heard in the news with regard to London Mining. My name is Claude Perras. I am the head of sustainability for London Mining. I am responsibility for health and safety, the environment and external relations, so I cover most of the angles when we develop projects. I am here to try to respond to your questions and to help you to better understand the Arctic and some of the challenges that the industry is facing there.

The Chairman: You have interests in Greenland, or you have had. Have you been there?

Claude Perras: I have been there many times. I am also leading the IBA negotiation with the Government of Greenland and two municipalities.

The Chairman: Excellent.

Claude Perras: I am quite well versed about the area and some of the challenges, especially in Greenland. I am originally from Canada, so I have also worked in the northern part of Canada, and in some of the provinces as well.

The Chairman: We look forward to your contribution this morning. Based on your area of expertise, how important in a global context are the mineral resources of the Arctic likely to prove to be in the future, and are there particular resources that might be of importance to the UK and its mining industries?

Claude Perras: The Arctic is a frontier area for the mining industry. The resources are there. They have started to be exploited and extracted in various parts of the Arctic. I can focus more on Greenland. Greenland does not have much experience of the mining industry. It is a matter of time before these resources are accessed. For the UK, there are different commodities—iron ore, rare earths, various nickels et cetera—that are strategic for any developed economy. These are the last reserves of various commodities existing on the planet right now. They will be developed eventually. It is a matter of time.
Q274 The Chairman: You have been listening to some of our evidence from the oil side of the business. Clearly one of the suspicions there is that because of the price of oil and gas, in a way there is less incentive to move from exploration into production. On the mineral side, there is perhaps this driver of rare earths or other minerals that are less prolific elsewhere, particularly in view of the Chinese position on rare earths. Do you think this will be a major driver, despite the difficulties? Is this a very different situation from that of the oil and gas industry in this area?

Claude Perras: In the mining industry, you have different commodities, so the cycle of the prices for commodities varies. You may have more drive to develop a certain type of commodity at a certain time. Right now, the iron ore price is quite low and the rare earth price is quite high, so it varies. It is a matter of timing. The industry will develop projects in the planning process for when the price will pick up. Currently, developing an iron ore project in Greenland would be quite challenging because of the price of iron ore, but when the price starts to go down a lot of companies start planning for when the price will pick up.

The Chairman: To come back to my first question on UK interests, are there particular resources that might be of importance to UK mining interests?

Claude Perras: I believe—I am talking about the UK and Europe—that currently resources such as iron ore, rare earth and other commodities such as gold are of strategic importance to the UK in the long run. Getting access to commodities is always a strategic issue for any country in the world, and I would think it is for the UK Government.

The Chairman: Thank you, I will come on to Viscount Hanworth. We welcome Mr Morgan.

Richard Morgan: I am sorry I am late.
The Chairman: I am sure the House of Lords is quite a difficult place to get into on occasions. We are on question 1 at the moment. Perhaps when we get to the next question I can ask you to introduce yourself formally.

Q275 Viscount Hanworth: Are there exploitable resources of uranium or thorium in Greenland or elsewhere in the Arctic Circle, and if there are what kinds of national interests or excitements have been expressed?

Claude Perras: There is uranium in Greenland. There is also uranium in northern Canada, in the Canadian Arctic, as well. These are strategic resources. There has been a big debate in Greenland about the exploitation of uranium. It has decided that it will proceed with the exploitation of uranium.

Viscount Hanworth: Do the Chinese have any particular interest that you can describe to us?

Claude Perras: The Chinese are prospecting like other countries. Currently investors in Greenland are coming from China, Canada and the UK. There is a broad range. It depends on where the head office of these companies is. Various countries are currently prospecting in Greenland.

The Chairman: Mr Morgan, would you to introduce yourself briefly, and then we will move on.

Richard Morgan: I would be happy to. I am in charge of government relations for Anglo American mining. We have certain interests in the Arctic, but not many at this stage, primarily on the Canadian side and in Finland. We had a look at Greenland as well. Essentially for us, it fits into the wider picture. There are about 10 commodities that we are after. In Canada it is mainly diamonds, and in Finland we were looking primarily at a copper-nickel polymetallic mine. There is a range. We have had some conversations with Greenland. That is the rough introduction to our interests in the Arctic.
The Chairman: Thank you.

Q276 Lord Moynihan: In the context of that introduction, have you had any support for your business activities in the Arctic from the UK Government?

Richard Morgan: We had a presentation at a UKTI-managed event in the City that focused mainly on the Scandinavian countries rather than on the Arctic per se. It was really about accessing Scandinavia, but with a view, certainly in our case, to mining further north, so we had some overlap in that sense, but on the Arctic as such, no. In a way, as with all these things, we have not yet got to the stage where there is enough commercial momentum behind our interest to be taking it further. It is still very much at the exploration stage.

Lord Moynihan: Do you have anything to add?

Claude Perras: There was a conference on the Arctic, organised by the UK Government, a few months ago. I believe it was last June here in London. I will focus on Greenland more specifically. As you know, the British embassy in Copenhagen looks after Greenland. My experience is that people are not very familiar with the area. The UK Government could do much more to support British industry if it is interested in really exploring the area. I am sorry to say this, but from experience I did not feel that they were very useful.

Lord Moynihan: Out of interest, do you know whether other Governments or the European Union give significantly more support to their companies looking to engage in the Arctic, and if so, can you give us any examples?

Claude Perras: The EU has called a few meetings about Greenland, which we have attended a few times in Brussels, with regard to the development of mining resources in Greenland. There are other countries. As you know, it depends on how the companies are being funded, but there are a lot of companies coming from Australia and Canada and prospecting. The last time I was there, state governments from the US were going there to help to
develop the infrastructure. As you know, one of the major problems with work in the Arctic is the lack of infrastructure. This is one of the areas in which other countries are coming forward to try to support the development of the local infrastructure, which is a major gap for developing some of these resources.

Lord Moynihan: In that context, do you feel that the UK could do more?

Claude Perras: Of course, much more. When you go to Greenland, you will rarely hear about any UK government support in the Arctic to help to support the development of these resources.

Lord Moynihan: Do you agree, Mr Morgan? Do you think that we can do more at government level to support your potential activity?

Richard Morgan: Certainly my exposure to Greenland has been exactly in the context that Claude describes. It was facilitated in Brussels and with a willing combination of the Greenland Government and the Danish Government. It did not particularly occur to me to try to work a UK angle into that. In my experience, we try to call on the UK Government if there is a political issue of some sort and we not getting the access that we think we ought to be able to get, whereas in this case they were being very welcoming.

Q277 Lord Oxburgh: Together you have quite a lot of experience in mining in various Arctic territories, and you will have experienced a range of different regulatory regimes. Will you talk about the similarity of those regimes, or the differences? To what extent do they cause difficulties?

Claude Perras: If we talk about Greenland and the Scandinavian countries, they are more or less following the regulatory framework that exists in Scandinavian countries. I must admit that in the case of Greenland the red tape is quite cumbersome. It is very difficult to progress any licences or projects in Greenland, because there is a lack of experience in
dealing with the mining industry. A lot of the time in our negotiations on the licensing, even now with the IBA that we are currently negotiating, I can tell you that it is quite difficult because our opposite numbers on the Greenland side have never done it before. There is a lot of red tape, and they are very suspicious. Being a former colony of Denmark, the bureaucracy of Greenland is mainly run by Danish people and Denmark is not a mining country either, so they do not have the experience. I am now a UK resident, and the UK could bring a lot of support to a Government such as that of Greenland with a framework of support for dealing with the mining industry to break these suspicions and to create a more favourable environment in order to engage in these negotiations.

Richard Morgan: It is an interesting follow-on from our experience in Finland. It was in the Arctic Circle and Finland has a mining tradition. I suppose I should preface this by saying that we increasingly think that there is no easy place to get permission to mine, so let us not set the threshold in the wrong place. Every place is increasingly challenging for various good and maybe not so good reasons.

The Finnish example was interesting for us, because they thought they had a good tradition of mining and wanted to show that and to get mining back up in the north of Finland—it would create jobs. But that was only one part of the government structure. It was largely the Ministry of Mines. It then transpired that there were more challenges to its authority than it had thought. The exploration team on our side was made up of geologists, and the mining technical team on the Finnish side thought it had an agreement, but in practice the Environment Ministry and others have a stronger remit to say that you can and cannot have licences to do things.

Lord Oxburgh: How does that compare with Canada?
Richard Morgan: That is interesting because Canada has a greater tradition of allowing mining, but in both cases as a responsible mining operation you will want to have full local permission. The issue in Finland had been reindeer herding, and in our case there is a relatively rare moss in the area. The Canadian bit and the Finnish bit freeze over in winter, clearly, but in the summer you have a lot of ponds and puddles with moss in, so it has been a question of seeing what is there without interfering with it. In the Finnish case, it is covered by a Natura 2000 conservation area, so you have to be extremely careful on those sites. In fact, in Finland, we have been drilling only in the winter when it is frozen so that we do not cause any disturbance to that. There is a whole question there.

In Canada, the question is the relationship with the indigenous peoples, the first-nation communities. The Cree are in Hudson Bay, but up in Snap Lake, which is further north on north-west side in the Northwest Territories, the issue is that we will build ice roads to service those mines in the winter. The communities tend to hold those roads to ransom, not particularly against us but because they want things out of the Government. They are used as a kind of bargaining tool. There is quite a lot of complexity to how you make those things work. We think that our relationship with the first nations is good, but it all goes to whether you can have a licence to operate.

Lord Oxburgh: So it is a very diverse picture, and there will probably be objections to what you want to do, but the motivations for those objections may have a different basis in different cases.

Richard Morgan: Yes, and that is similar in all parts of the world. We had a very big potential project in Alaska, which in the end we walked away from for much the same sort of reason – the Pebble project. Again, it had quite a lot of local support, but there was a wider national
decision and it conflicted with the salmon fishermen. The moral of that story is not to go up against salmon fishermen with deep pockets.

**Q278 Lord Hunt of Chesterton:** We have touched on this, but what measures do you take to mitigate environmental and societal risks in your work?

**Richard Morgan:** I rather anticipated that question.

**Lord Hunt of Chesterton:** That is all right. Might measures be required in Arctic states that are very different from those elsewhere in the world? One of the things that I learnt a bit about in Sweden is that in the Arctic areas they are using these presumably old mining areas for storing nuclear waste. If you fill a mega-hole in the ground, are there things that you can put into that hole such as nuclear waste? There is a nuclear programme in Sweden and a growing one in Finland. Is that something you would get involved with?

**The Chairman:** Finland is building its own hole at great expense.

**Richard Morgan:** I do not have particular experience of that. The wider question about the social and environmental risks applies everywhere we mine, but obviously in the Finnish example I gave—

**Lord Hunt of Chesterton:** The Arctic Council is, hopefully, a way of sharing best practice and knowledge. Does it have any role in that respect?

**Richard Morgan:** I do not think we have had enough engagement.

**Lord Hunt of Chesterton:** Is there no sort of industrial panel in the Arctic Council?

**Claude Perras:** I understand that there is a private sector group that works with the Arctic Council, but the framework for social and environmental impact is left to each country and each jurisdiction to decide how it wants to do it. Greenland, for example, has resiled from the Danish regulatory framework, and each province in Canada has its own regulatory framework, so it is very complex. It varies depending on which direction you go in, but more
or less they follow the same standard. Today, you are also scrutinised by external groups—
the NGOs and the advocacy groups—and you really need to be robust about social and
environmental impacts. Then they need to be diffused, and discussed in public hearings to
make sure that they are, but you will always have groups that are against these resources.

The Chairman: Perhaps I can just come back to the core of Lord Hunt’s question. I think we
are all aware, from the previous session, of the obvious environmental risks offshore. Mining
is, at the moment anyway, completely onshore. We have talked generically about the
environmental risks onshore in the Arctic, but I do not think we have ever talked about what
they are. Could you just tell us about those environmental studies and give us a list of the
top priorities in relation to environmental issues? What are they?

Claude Perras: As Richard said, one issue is reindeer—in Greenland, disturbing the caribou
herds when they are moving around. Water contamination, depending on the type of
mineral that you are extracting, is another. Those are the main issues. In most cases, there is
not much population. There are only herds of caribou, that is all, so you are not disturbing
the environment for human beings as such. Those will be the three things when you are
talking about onshore.

Offshore, people are concerned about the boat when you are shipping the mineral out—the
impact on the fishermen, the whales or some of the birds and fish. Those are the issues that
have been raised by the local fishermen’s and hunters’ associations in Greenland for
example. The same issues are raised in Canada by fishermen’s and hunters’ associations,
especially from the native groups. With mining projects, the question is how you minimise
the environmental impact on those groups, especially on the fauna and the flora.

The Chairman: Mr Morgan, would you have the same list? There is one thing that I am
particularly interested in as I come from Cornwall, where there is a load of mining waste,
some of which I can see from my back garden. Is that all shipped out as well? How is that
dealt with in the Arctic?

Richard Morgan: The mining in Finland has not got to that stage yet, but no, the waste is of
such magnitude that you could not ship it out. With diamond mining, for example, it
depends, but you tend to be moving 1 tonne of rock to get 1 carat in diamonds, so you have
a lot of waste rock, although that is good in fact: the diamond concentration in Canada and
our mines is not as high as that. So a lot of rock is being moved and you have to have an
agreement about where you leave it locally. In practice, we grind a fair bit of it for putting
the roads in place. There is a footprint, and you obviously have to negotiate very carefully
with everyone to ensure that the footprint is as minimal and contained as possible.
Biodiversity, and whether you are impacting on migratory flows, is a big issue. It is a question
of access and being open with the community, then about being open in recording what you
see and do not see, and about whether you have to have special treatment of your food
waste so that you do not attract bears and things like that. All that has to be considered.
Water is a big issue, as when it is not frozen the area is very wet, so you are often de-
watering a lot of the mines. Sometimes you put it into the local rivers, and the De Beers
people claim that the water purity has to be as high as bottled water that you would buy to
put it back into the water system. The social and environmental requirements are high
anywhere you mine, but they are probably more stringent and more scrutinised in the
Arctic, for obvious reasons.

Q279 Lord Hannay of Chiswick: I wonder whether we could stand back a little and either or
both of you could comment on how mining in Arctic regions has changed. It has obviously
been going on in Svalbard for a very long time. How has the mining changed in recent
decades, and in what ways are the standards which the Arctic Governments require of
Anglo American and London Mining plc – Oral evidence (QQ 203 – 213)

mining companies now different, particularly with regard to the issues that you talked about, such as community consultation and what you do if you close your mine or withdraw from the project? Have these become much more demanding in recent years? Are they moving constantly towards criteria that are more demanding on mining companies, or are they reasonably stable?

**Claude Perras**: On the closure side, the Quebec Government, for example, have open pits and mines with liabilities of $1.2 billion, which the province now has to absorb because the developer opened the ground and then went bankrupt and left without closing them. Today mining has evolved: you have to put guaranteed funds in the bank, on the day you start, for the closure process. It is much more sophisticated than it used to be, and large companies have already taken steps. When I worked for Rio Tinto, this was built into its financial model and the CAPEX from the outset; it is built in when you start your investment. Alcan—British Aluminium—was the same, as all the plants had a lifespan. That has evolved a lot. The Arctic is an extremely sensitive area for them and companies want to make sure that they have learnt from history. They have seen what has happened in other countries where there has been a long tradition of mining, and they want to make sure that that does not happen in this area in the future. The framework is not more stringent; it is just more responsible in terms of making sure that you have the resources for rehabilitation after the mine closes.

**Richard Morgan**: I think that standards have got progressively more demanding, whether that is coming from the Governments per se, as Claude says, or from our own self-governance. Obviously from a reputational point of view you need to be seen to have covered every potential risk as well as you can, because if you have a reputation for having not done something well in a sensitive environment, you are not likely to get permission to do it again somewhere else. It is a mixture of greater scrutiny and greater standards. I think
there are shared standards across international bodies now, under which everyone knows what you are referring to when you say, “Yes, we will meet that standard or this standard”. There is greater expectation.

**Claude Perras:** You have two types of plan now, the environmental closure plan and the social closure plan, because you know that sometimes in these frontier regions and very remote areas the local town and community can be fully dependent on one industry. What is the plan to ensure that it does not collapse or die after the mine shuts down? A lot of work is done now in preparation for that and on how you support economic diversification. That was not the case before. Then again, it depends who the developer is and what standards they are following or implementing.

**Lord Hannay of Chiswick:** Are most companies taking on board the fact that during the lifetime of one of these projects these controls and regulations are likely to become stricter? Are they capable of responding financially to increased demands?

**Richard Morgan:** I think the big companies are.

**Claude Perras:** I do not think it is a problem for the large ones. I would say that it is mostly the junior companies trying to develop resources that might be looked at. As Richard was saying, the ICMM has set some standards, which we are trying to follow. Then you have the IFC standard as well. There are a lot of standards and now you have a new initiative called the IRMA, which is the international responsible mining accreditation, which again is trying to bring some standards. We are moving in that direction. It is a matter of time, because the customers are asking for certification and want to make sure that any product is developed responsibly.

**Lord Hannay of Chiswick:** Are you saying that small companies are rather disadvantaged compared to big companies in handling this evolution?
Claude Perras: I would not say that they are disadvantaged, but they may not have the internal capabilities or the understanding that the larger ones have. I am the head of sustainability in a smaller company, London Mining, which had the foresight to put somebody in that post. You will not find that in other mining companies: there will not be a head of sustainability or a watchdog to make sure that the company does the right thing. Again, it is the host country that has the resources and that decides to whom it will give the licence. Selection criteria need to be put in place. I always say to Governments that they should give licences to companies that are responsible and are following certain standards, to make sure that they are developing their resources responsibly for the benefit of the local people.

Viscount Hanworth: We have already covered these issues in part, but I shall raise the question again. What have the responses of indigenous people been to the operations of the mining companies? What measures do companies take to accommodate the interests of indigenous people and to ensure that they benefit from these operations? Your answer will need to be specific to the various regions in question, because experiences vary quite widely.

Richard Morgan: In our mine in Hudson Bay, we work with the Cree community, and probably about 60% of the workforce will come from that community. That will vary a little from area to area. Obviously your licence will depend on the local community feeling that it is getting something out of it, which is generally jobs. That is recognised. But it has been as much negotiated by us with the community as it has been through the Government. Sometimes in certain countries you will get a target and you are told to make sure that you employ so many people from indigenous communities, but in our case we just made it work.
Viscount Hanworth: Have such requirements in relation to the local people impacted on the profitability of these various enterprises, to the extent that some have not been pursued?

Richard Morgan: That is a big question.

Claude Perras: To be very frank with you, this is something that you always debate internally: what is the business case? If you have a captive population close to your mining site, it is much better to invest in training them than to bring external people in, who are expensive to “fly-in, fly-out”, as we call it in the industry. That is extremely expensive. Most companies that have some experience would prefer to invest in training local people because they are there and it is much cheaper than having to bring people from overseas to work on the mine site.

Viscount Hanworth: You have indicated that that possibility does not arise in certain parts of Greenland—I imagine in the western margins. Is that the case? What recourse has been necessary in order to run the operation?

Claude Perras: This is being addressed by the IBA—the impact benefit agreement—in which targets are agreed between the developer and the local government on the number of people you will have to train and how gradually over the lifetime of the mine we will start replacing expatriates with local people.

The Chairman: We are going to come to this in the next question. In Canada do the first nations, or in Greenland the indigenous populations, have a veto over mining development these days?

Claude Perras: In Canada they have a veto. In Greenland they do not. The structure is different. In Canada you have to negotiate with each tribe. I am from Canada and I am not scared of saying that the Canadian system is a mess. It is not transparent. Each native group can negotiate whatever it wants, and junior companies promise the world to some of these
groups, which they will not get. Then you get to Greenland where it is very structured and there is no room for negotiation. It is very public. In Canada the IP agreements, most of the time, are not public. You do not even know how much money the native groups are receiving. You cannot find out how much they are getting. It is a private deal between the developer and the native group. In Greenland, it is fully public.

**The Chairman:** How about in other parts of the Arctic, such as Russia?

**Richard Morgan:** We do not do Russia.

**The Chairman:** Lord Soley, would you like to pursue that?

**Q281 Lord Soley:** You have largely covered it, but just to be clear, having heard that last answer about the difference between Canada and Denmark it is perhaps hard to get a clear picture of this. Mr Morgan, I think you said that some 60% of the Cree were involved in your project.

**Richard Morgan:** Some 60% of our workforce for the mine near Hudson Bay were from the Cree community.

**Lord Soley:** Would you expect that to be the normal figure for mining operations, or does it vary so much that you cannot predict?

**Richard Morgan:** We do not really have enough of an operation base across the Arctic to be able to say that, but in practice there is no reason why you should not be able to arrive at that number. To go back to that question, it should not necessarily affect your business case. It is probably more difficult where you have to fly everybody in. The distances in Canada are so huge that the Cree community is 100 or 200 miles away. You are not on the doorstep, so you have to fly them in as well. The flight goes from Timmins up to the Cree town and then across to the mine, so it does a dog leg. They live in the same way the rest of
the staff do on the mine. It is a completely self-contained place where people stay for their shift.

_Claude Perras_: I would just like to add that one of the challenges that we have in Canada and in Greenland is the issue that people are not used to working on schedules as we are in cities in the “white world”. Most people have a traditional lifestyle, so to start work from 7 am to 5 pm or 7am to 4 pm during the daytime is quite a challenge. When I was working at Rio Tinto, every time we worked with native groups it was difficult to do that, so establishing a target for local employment is quite a challenge. As you will appreciate, in addition you have drug addiction and alcoholism in these communities due to their history. They are inherent. It is very difficult to train some people and retain them. Retaining native groups to work on mining sites is quite a challenge. The Greenland Government are very cognisant of that and are trying to put programmes in place. They even have categories of people. They call them A, B, C and D. D are like you cannot do anything with them, A you can hire them and B they need support from the Government to be able to work for you. It is a very complex structure. It can happen but it requires substantial investment. In these cases, it is very important that the local government, in the case of Greenland, partners the company that is developing the resource, as we do in Canada. In Canada, the provincial and federal governments will pull resources together to have training programmes to support the hiring of local people. I would call them private/public partnerships.

_Lord Hannay of Chiswick_: On this subject, could either of you give a feel for the extent to which the companies involved really try to use local people in increasingly sophisticated roles in their mining? To what extent is that 60% that you talked about the bottom 60% of jobs? That surely makes a very big difference to the amount of buy-in you get from local communities if they think they are being bettered, as it were, by this presence.
Claude Perras: It is a challenge to bring people into higher positions in the industry. These groups are not well equipped, so they start at the bottom of the scale and then climb up the structure. When I was working for Alcan, we had one plant manager from the native groups in Canada. That was the only one across the whole country and we had 60,000 employees. It is not much. We have to be very clear that there is a history. It is a big challenge. In most cases, the effort that needs to be made is to understand the local culture, adapting your work schedule and allowing them to go hunting when it is the hunting season. There are all sorts of complications. It is a very complex environment to work in. It is not as easy as it may sound.

The Chairman: This is obviously a very complex issue. Is social research undertaken in this area to try to help this move forward?

Claude Perras: Correct. There are engagement practices. A document has been written in Canada about how you engage the community, how you maximise local employment and what kind of programme you can put in place. It does exist. There are a lot of things. Again, the larger companies have access to that information. They will look for it because it is part of the commitment. The smaller ones that do not have the experience will sometimes go into a minefield and will start developing a resource without having that expertise or background information, and they will make some mistakes.

Q282 Baroness Neville-Jones: In the light of that last conversation, I would like to ask you a compare and contrast question. Given the difficulties that you have been outlining with labour skills, community dynamics, infrastructure demands and all these things, let alone a fragile environment, in your view is exploitation in the Arctic more difficult or in the end the same as mining anywhere else—with variations appropriate to the region, obviously? Every area has its own specifics, but in the end are all these difficulties that we have been talking
about washed out by much more global considerations about the utility of what you are getting, the price you are getting and your commercial considerations?

Richard Morgan: You are weighing a very similar set of challenges wherever you are. With diamonds, for example, we are as likely to approve another project in the Canadian Arctic as we are in Angola—probably more so, in fact. A lot of factors go into that. To an extent there will be a financial consideration, but you also have to weigh the political risk.

Baroness Neville-Jones: I was going to say that there is political stability at any rate.

Richard Morgan: That is a real question for us in Angola versus Canada. The Arctic remoteness and fragility is part of it, but it is not predominant.

Claude Perras: As I think you appreciate, it is a fragile environment, so more precautions are needed. There is some experience that we need to draw from that. The challenge in the case of Africa is instability at government level. You have more stability up north. It is a matter of balancing the equation and looking at the business case and where there is less risk. From an operational perspective, working in the Arctic is a challenge. Let us be very clear that it is a challenge because of the weather, the biodiversity and the environment, but you have other challenges as well. If you go to Africa you have Ebola and malaria.

Richard Morgan: You have a lack of water.

Claude Perras: Exactly.

Richard Morgan: Or at least you have other democratic claims on that water.

Q283 Lord Hunt of Chesterton: You mentioned the variability of the ice melting on your operations, but you have not said explicitly whether climate change effects and risks are significant for your role. One of the features of climate change is that it affects significantly the lifestyle and activities of native people in those areas. I do not quite know whether it
will be helpful. In your companies, are you making long-term assessments of this as a factor for your operations?

**Richard Morgan**: That is a very good question. You are right. I have not mentioned it, partly because you cannot always find geologists to agree with you on our side about whether it will make a real difference. I know we are looking at a 30 or 40-year timescale.

**Lord Hunt of Chesterton**: On that timescale people are suggesting very large changes.

**Richard Morgan**: They are. I do not know whether your geologists agree, but our geologists say that it may be getting warmer in some places, but not necessarily.

**Lord Hunt of Chesterton**: Geologists generally have been rather sceptical about climate change.

**Richard Morgan**: Our exploration teams are made up of them.

**Claude Perras**: Climate change is one of the big risks. The larger companies factor it in. It requires some internal skills that the smaller companies do not have. When I was working for Rio Tinto and Alcan, we had a full department focusing strictly on climate change. We knew exactly what mitigation measures to plan to put in place for the next 20 years, but you will not find that in smaller companies.

**The Chairman**: Mr Perras, Mr Morgan, thank you very much indeed. That brings us to an end of this session. I thank you for contributing. It has been most useful. That ends the public session of this Committee. I ask the public to leave. I thank them for having attended. We have one item of business which Lord Moynihan wants to raise and some papers to note and then that is it.
The Arctic runaway meltdown crisis:
Governments must collaborate to cool the Arctic

Preface

A large degree of optimism, and reluctance to admit danger, is part of the human psyche. The most important interventions in human history have been almost too late, and usually so late as to have allowed a lot of human misery. (We are seeing the same today, where climate change in Africa and the Middle East is causing hunger and, with it, a lot of strife.)

With Hitler, we lost a lot of precious armament time during the appeasement, while Churchill was almost in despair to persuade the government to intervene. In the Balkans, we eventually intervened, but only after thousands of lives were lost and a great deal of mutual trust between neighbouring peoples destroyed.

Today we are faced by at least three great environmental crises, which are unfolding slowly, so that there are no particular events to mark them. They are the greenhouse gas warming crisis, the ocean acidification crisis and the Arctic meltdown crisis. We are not psychologically prepared for such situations. We are not used to dealing with environmental crises of such magnitude. And it is impossible to attribute a particular event, like Katrina or Sandy, definitively to greenhouse gas warming. We are not willing to accept that there are commitments and inevitable things which will happen in the future as a result of our past and current behaviour, unless we do something about them. And we find it extraordinarily difficult to face up to the greatest threats, especially the more immediate ones.

What makes our own behaviour particularly inept at dealing with these crises, is that we have a very strong feeling that we should not “interfere with nature”, when nature has looked after us for millions of years. This view of nature is out-dated. We now refer to the “Earth System” rather than Mother Nature. And the Earth System is not as stable as we used to think. In fact it is only by fluke that we developed our intelligence beyond the other apes, and it is only by fluke that humans have been able to develop agriculture as a stepping stone to civilisation over the past ten thousand years. As Brian Cox has explained, the sun and moon had to be exactly the right mass and the right distance, with the Earth wobbling on its axis the right amount and with the ellipticity of the orbit changing over a 400 thousand year cycle, to obtain changes in the NH environment and hence human brain size to deal with them. And then there needed to be a stable climate, fertile soil, and suitable flora and fauna for humans to develop their civilisation.

Brian Cox points out that we have the same brains for going into space as we had for developing our civilisation. We are now equipped with these brains and space technology which allows us to understand our situation on this planet, and what needs to be done — or so you would think. But we see our crises in human terms and our fights have been against a human enemy. We adapt to what nature throws at us.
So, now we need a new way of looking at our planet and a new awareness of the processes. We have to recognise that we cannot simply adapt to the major environmental crises which we face: we have to be proactive in managing those aspects of the Earth System which could otherwise lead to our demise. We can no longer rely on the Earth System to recover on its own accord.

Thus, we have a chance to move on to the next evolutionary step in our development: the ability to nudge the Earth System back into alignment with the requirements of sustaining a large population of Homo sapiens on the planet. And the most urgent of these requirements is to cool the Arctic sufficiently to restore the Arctic sea ice, thus returning the Earth System’s principle temperature and climate control mechanism to its former state.

This is a great challenge, but it can be met thanks to processes demonstrated to us by the Earth System itself, namely albedo enhancement through cloud management. The situation provides an unprecedented opportunity for international collaboration. Instead of fighting one another, we can be working together to meet this challenge. And, as we start to tackle this challenge, we are in a better mental state to meet the challenges posed by the challenges of greenhouse gas warming and ocean acidification.

**Warning of immediate crisis**

I am writing on behalf of the Arctic Methane Emergency Group, AMEG, to warn the government about a monumental crisis which has been brewing for years – a crisis which now demands immediate action to prevent it getting out of hand. The Arctic is showing signs of runaway meltdown which has to be stopped.

This situation has been almost totally ignored by climate modelling community who have failed to warn about the significance of recent observations and deductions on the sea ice decline. I am sending you this letter following a conference on Arctic sea ice at the Royal Society.

The conference was asked to warn governments about the tremendous risks involved in allowing sea ice to continue in its “death spiral”, as graphically illustrated by Professor Wadhams at the conference and backed up by actual measurements of the sea ice over decades.

The threat from climate change is far greater than expected, as Arctic sea ice retreats and Arctic warming accelerates. But, remarkably, this threat can be overcome. This presents an unprecedented opportunity for international collaboration to halt the Arctic warming, while this is still possible.

AMEG has undertaken extensive scientific research to identify the critical problems arising from Arctic warming, ignored by IPCC in AR5; and AMEG has done the necessary calculations to establish that interventions to solve these problems are possible – interventions dismissed by IPCC as premature, too dangerous or simply unnecessary. But these calculations show that it could soon become too difficult to halt the Arctic warming by affordable and benign techniques based on natural processes. Thus time is critical.

Scientists agree that climate change is upon us, manifest in a growth of weather extremes over the past 15 years. Extremes of heat and humidity were expected to increase with global warming and average surface temperature increase. But since 1998 there has been a hiatus in warming over most of the planet with the exception of the Arctic, which has
warmed dramatically. Thus, purely from these observations, it is plausible that recent weather extremes might be an effect of Arctic warming rather than global warming. The Arctic is implicated in temperature and climate control of the whole planet. The reflecting surface of snow and ice ensures a low temperature at the poles compared to the tropics. This temperature difference keeps the weather systems in the patterns to which we have been accustomed. A slow change in climate might have been expected as the Arctic warms. But IPCC has totally failed to anticipate the speed of warming in the Arctic, with models forecasting that the sea ice would last beyond the end of the century.

As scientists, we look for a causal link when there is an apparent correlation, as between Arctic warming and weather extremes. Recent research, particularly by Jennifer Francis of Rutgers University, has shown the likelihood of a causal link through the disruption of jet stream behaviour such that the jet stream produces long periods of stuck weather at lower latitudes.

Note that the stuck weather may be cold or hot, wet or dry. Furthermore, since the jet stream is meandering further north and south, it is producing extremes of heat in the north (such as in Greenland recently) and cold in the south (such as in US recently). The cold effects are difficult to explain purely on the basis of global warming.

On Wednesday 16th April, some of us attended a public review of the IPCC’s fifth set of assessment reports known as AR5. These reports rightly highlight the importance of reducing our CO2 emissions. But they suggest that “inevitable” consequences of climate change can be dealt with by “affordable” adaptation. This is simply not true. Adaptation to the worst consequences of climate change will not be possible, let alone affordable. The IPCC process of consensus science has failed to identify the greatest risks—risks which are both high probability and high impact—short-term risks which will increase exponentially unless immediate action is taken.

At the review meeting we asked the Secretary of State, Ed Davey, whether he was aware of serious omissions from these assessment reports. Was he being properly advised? In particular, was he aware of irreversible meltdown of the Arctic ice cap and the non-linear consequences: an exponential increase in discharge of ice and meltwater from the Greenland Ice Sheet to raise the sea level; an exponential increase in the emissions of methane from the Arctic seabed to exacerbate global warming; and abrupt climate change in the Northern Hemisphere with a growing food crisis?

**Six significant effects of accelerated Arctic warming**

1. Accelerated meltdown of the Arctic ice cap

   As sea ice retreats, more sunshine is absorbed to warm the ocean and cause further melting in a vicious cycle, with accelerated warming of the whole Arctic ice cap, including ice sheets and permafrost. The IPCC reports singularly fail to mention this accelerated meltdown. It is undoubtedly an effect of global warming and was probably triggered twenty or thirty years ago. The sea ice is already well past its tipping point, as recently acknowledged by a leading expert on tipping points, Tim Lenton; yet this is not mentioned by IPCC. The meltdown is effectively irreversible, without intervention to cool the Arctic. There is nothing in nature which will automatically stop this meltdown. There is no natural cycle which will bring back the sea ice. Yet the IPCC reports explicitly say that the melting in the Arctic is reversible, and they say this with complete confidence. Can they be trusted?

2. The consequence for sea level

   The IPCC reports say that the Greenland Ice Sheet is only contributing about a millimetre of sea level rise per year, and imply that there is nothing to worry about. But do you know
about the latest research suggesting the discharge has been doubling every five years for the past twenty years? This cannot be due to natural variability of Greenland's temperature, but can be explained by accelerated Arctic warming. If this trend continues, we could see several metres of sea level rise this century, which would be devastating for low-lying countries and extremely serious for London and many other conurbations built on tidal waters. The sea level rise from the Greenland Ice Sheet is liable to provoke a similar contribution from the West Antarctic Ice Sheet (through accelerated discharge of ice from glaciers whose ends are currently grounded on the seabed), leading to a total of around 15 metres from the two of them, sooner or later. Recent research (yet to be published) estimates sea level will rise four metres this century.

The exponential trend in Arctic warming is liable to continue until the whole Arctic Ocean is free of sea ice throughout summer, producing the maximum warming effect. This could happen within the next two or three decades, given current doubling rates. Since the last glacial maximum there have been periods of rapid melting when the sea level rose 5 cm per year, or half a metre per decade. This rapid melting was probably fuelled by an ice-free Arctic Ocean – there is no other obvious explanation. The planet could again be moving towards this situation, implying that the sea level would rise about four metres this century, agreeing with the estimate above.

3. The consequence for methane

IPCC reports make passing mention of growing quantities of methane bubbling out of the Arctic seabed, but experts are saying that there is no natural mechanism for rapid release of large quantities into the atmosphere. Yet observations show that, as the ocean warms, the methane discharge from the seabed has been growing exponentially, with a marked increase of methane in the Arctic atmosphere. Methane is a potent greenhouse gas, around 84 times as potent as CO2, weight for weight, over 20 years. If the current exponential trend is followed, methane could become the dominant greenhouse gas within two decades and we could get catastrophic methane feedback to global warming, as the Arctic warms even faster and methane is emitted at an even higher rate. There is evidence that such outbursts of methane have occurred in the past to cause mass extinction. And there is a vast store of methane below the permafrost which could be escaping through the growing number of perforations.

4. Abrupt climate change

Met Office reports suggest that the current weather extremes amount to climate change and are due to current global warming. Clearly the Met Office objective is to persuade the government to do more to reduce CO2 emissions. However these weather extremes have grown through the past 15 years while there has been a global warming hiatus, so there cannot be a direct link. On the other hand, an entirely satisfactory explanation has been given by Dr Jennifer Francis of Rutgers University, backed up by research and observation. Her explanation is as follows. The rapid warming of the Arctic (warming much faster than the global average) has reduced the temperature gradient between the tropics and the Arctic. This temperature gradient drives the jet streams in a wave pattern that moves from west to east around the planet. As the gradient is reduced, the wave meanders more to north and south, giving hotter spells in the north and cooler in the south. And the wave tends to get stuck in stationary patterns, which give rise to long spells of stuck weather, be it hot, cold, windy, wet or dry. We have been observing a dramatic increase of this type of weather extreme in the Northern Hemisphere over recent years, e.g. in the UK with the exceptionally wet and windy weather this past winter. Arctic warming appears to have
become the main driver of climate change, with global warming an additional or compounding factor. (By increasing the background temperature and humidity, global warming makes hot spells hotter and wet spells wetter.)

5. Effect of this abrupt climate change on food and security

The rapid rise in weather extremes amounts to abrupt climate change; and this is causing widespread crop failures and an increase in food prices. You will have observed the unrest in Syria and elsewhere in Asia and Africa, but have you heard that the unrest is partly due to food prices rising above the crisis level at which rioting can be expected in many countries? As Arctic warming continues, we can expect further deterioration in this situation. A good account of what may be in store for us has just been published by the Ecologist. The long-term trend is inevitably towards mass starvation and global conflict.

6. An addition to global warming

As the snow and sea ice retreat, the albedo loss has an immediate effect of local (heat) energy absorption but also contributes to the global energy imbalance. A study of satellite data published this year in the Proceedings of National Academy of Sciences shows that albedo has significantly reduced in the Northern Hemisphere, contributing the equivalent of one quarter of the heat-trapping effect of CO2, currently at between 1.6 and 1.7 Watts per square metre. This approximately doubles the previous estimate of albedo loss made without that data showing how much sunlight is actually reflected back into space. However the albedo loss is increasing as snow and sea ice retreat. The ultimate heat contribution, when the snow and sea ice have disappeared for much of the year, could be equivalent to a doubling of CO2 at approximately 3.9 Watts per square metre. Such an addition to the energy balance would kibosh all efforts to keep global warming to a safe level through emissions control.

Interventions to deal with the crisis

Since the IPCC reports suggest that adaptation is possible to the consequences of climate change, can you now believe what they say? What is the alternative? Is there an alternative? What should the government do?

We urge you to consider interventions to cool the Arctic, including employment of geoengineering techniques of the cloud-cooling type but on a regional scale. We are aware that IPCC’s consensus-finding process has reinforced prejudice against intervention to reduce identified risks. We are aware of much antipathy to geoengineering stirred up by the media. And we are aware that most environmental groups are vehemently opposed to geoengineering.

But the fact is that intervention to cool the Arctic is now the only way that the vicious cycle of warming and melting can be broken. This is the way we should be fighting climate change resulting from Arctic warming. And the required intervention techniques, such as cloud brightening, are eminently affordable, ranging up from less than a $billion a year to a few $billion per year. Whole-hearted intervention will be infinitely cheaper than attempts to adapt to an ever-worsening situation of rising sea level, methane feedback and food insecurity, as costs to prevent human tragedy would become prohibitive.

The prejudice of the scientific community, media and environmental organisations against intervention must be resisted, because without intervention we face dreadful consequences.

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1 The melting Arctic:
http://www.theecologist.org/blogs_and_comments/commentators/2343095/the_melting_arctic_and_revolutions_to_com e.html
for which adaptation will be practically impossible. Over past years the government could have been strongly supporting research and development of geoengineering techniques; yet, sadly, our top government scientific advisers have been saying that geoengineering would be premature. The advice has always been that the government should focus on greenhouse gas emissions reduction, but this cannot save the Arctic from meltdown. Thus the Arctic situation has been allowed to deteriorate.

Worse still, the government seems happy to see the exploitation of the Arctic for oil, gas and other resources, even though this is highly dangerous for the environment. The government ignored the plea from the Environment Audit Committee to have a moratorium on drilling in the Arctic.2

Be that as it may, international collaboration for rapid development and deployment of techniques to cool the Arctic must now become a top government priority. And somehow the government must deal with the world food crisis that has already broken, with all its economic, social and political repercussions. There is no time to lose.

October 2014

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2 Moratorium demanded:
http://www.theguardian.com/world/2012/sep/20/mps-demand-moratorium-arctic-drilling
TUESDAY 7 OCTOBER 2014

Members present

Lord Soley (Chairman)
Lord Addington
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Moynihan
Baroness Neville-Jones
Lord Oxburgh
Baroness Symons of Vernham Dean
Lord Tugendhat

Examination of Witnesses

Professor Geoffrey Boulton, School of Geosciences, University of Edinburgh, on behalf of the Royal Society, Dr Andrew Foxall, Director, Russia Studies Centre at The Henry Jackson Society, and Tim Reilly, Arctic Advisory Group

Q158 Lord Soley: Welcome, gentlemen. We are very pleased to have you here. You know what the Committee is about. I think you had an indication of what we want to cover today. This is a particularly important area, dealing mainly with Russia. First of all, you have a declaration of interests for each Member of the Committee for you to view. This whole hearing is being webcast live. You will also get a written transcript of the notes, which you can then look through and come back to us if there are any issues you wish to raise.

The Arctic Council, which we heard a lot about during our visit to the Arctic, is clearly an evolving international organisation and quite an interesting one. What is quite difficult for us
to work out is Russia’s policy towards the Arctic Council and how it makes its voice heard in that council. What do you know about that? It is the issue again of this emerging international body, Russia’s view of it and how it works within it.

Professor Geoffrey Boulton: I suspect that the perspectives, the lens through which those of us here might look at this, will be rather different. The Arctic is a sphere of increasing competition, but at the same time it is an area of dialogue and collaboration. Much of the latter is of course concerned with scientific issues. It may well be that those concerned with geopolitical problems might see things rather differently from those of us who are scientists. I will say something about the Arctic Council, which I know something about, largely because of having been involved with Arctic research institutes including Russians and Scandinavians. My perspective is that Russia wants to have a strong voice in the Council. It is very happy about and has developed ways of working with the rim nations around the Arctic rim, but is rather sensitive to the potential that the Arctic Council might expand. I think that it feels that other rim nations understand its concerns, why they are its concerns and the way it likes to work. There have been strong collaborations across the Arctic between the Russians and the Scandinavians in particular. Russia is very concerned that the Arctic Council might become a very different beast in its home terrain. That certainly feeds its way into the scientific community, in that I and some of my colleagues have noticed that over the past few years there has been a tendency for Russians to work with other Arctic rim nations whenever it can, rather than doing what it has done historically and have a much broader set of collaborations.

Lord Soley: That is very useful. Your role as a scientific adviser to the Prime Minister is very helpful. I will come back to the science questions a bit later on, but that is a useful description of how you see it.
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

**Dr Andrew Foxall:** I agree with what Professor Boulton has said. I would simply note the caveat that, broadly speaking, Russia seeks two things from the Arctic Council: first, to further its own policy interests; secondly, to achieve its national goals and interests, as broadly understood. In that sense, Russia is like every other member of the Arctic Council. It acts pragmatically, it forms temporary collaborations and undertakes co-operation with other members when it is in Russia’s interest. When it is not, it declines that opportunity to do so. For example, Canada and Russia are often seen as the two most militarised and belligerent of the Arctic states. Actually, in terms of the Arctic Council, they get on relatively well, at least in one or two respects: they agree on the sovereignty of the Northern Sea Route and the North West Passage. With Denmark and Greenland, Russia has formed a temporary alliance about resource exploitation. In a number of other respects, it fosters these alliances as a way to further its goals and interests.

**Tim Reilly:** I agree with all that has been said. Its real policy in the 21st century is, as a resource base, it thoroughly endorses and encourages the council. Indeed, it was the founder member of the Arctic Council through Gorbachev’s meeting in Murmansk in 1986 and later as an environmental commission in 1991. They are fully behind the mandates of the Arctic Council: no defence, strategic discussions, sustainable development and environmental protection. However, I think very much in terms of national interest, as has been mentioned, they may have hesitation about aspects of the direction of the Arctic Council, but I think that is now held equally by all powers, especially with external observers and the rise of Asia. They are probably exacerbated, in general terms, by the climate change that has made the economics viable and the northern sea route potentially possible. I think that some tension is there, but it is in favour of regulation and control of the region and the northern sea route.
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

In my opinion, Russia is the indispensible nation in the Arctic Council. Russia’s leadership and science, as we will discuss, are vital to the Arctic in general and to the European Arctic specifically, which may be the reason why it has such close connections with Scandinavian countries. In my opinion, it is very important to differentiate between the North American Arctic and the European Arctic, namely because the main geopolitical, strategic, economic, governance and globalisation factors in the Arctic are largely—almost unanimously—in the European Arctic, not the North American.

Q159 Lord Soley: Leaving aside science for a moment, where I think co-operation is very interesting—we will return to that—would all three of you feel that the co-operation between the nations on the Arctic Council is pretty good?

Tim Reilly: In my opinion, it is frankly amazing as an international forum in its collaboration, co-operation, and decision-making by consensus or compromise when necessary. As an international forum, it is a fantastic model for international co-operation between superpowers—former superpowers, in one case—and future superpowers in the case of Asia. As a forum, we should hope to maintain and strengthen it and in no way, shape or form, undermine it.

Lord Soley: That is very helpful. I should explain that we obviously have a particular interest in Russia because it is the largest littoral state. It is very important in terms of its relationships generally on all the issues affecting the Arctic. It is also affected at the moment by the sanctions that are being applied by the European Union and North America, which is why we are giving some extra time to this.

Baroness Symons of Vernham Dean: Before we move on, did you say that Russia was the indispensible member of the Arctic Council or an indispensible member? There is a difference.
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

**Tim Reilly**: Of course there is. I would say it is the indispensible country in the Arctic.

**Professor Geoffrey Boulton**: All you need to do is look at a polar projection of the Arctic and you see why Russia is indispensible. The opening of the sea route will be much more powerful on the Eurasian fringe of the Arctic Ocean, with the potential economic consequences greatest here too. Many scientific issues and environmental impacts relate to the development of the Siberian and Russian land area adjacent to the Arctic Ocean and the impact that will have on the sea terrain. From both a scientific and an economic perspective, Russia matters absolutely centrally in this domain.

**Lord Hannay of Chiswick**: Could I ask a factual question, please? In the distinction you made between the North American and the European sides of the Arctic, on which side of the line is Greenland?

**Tim Reilly**: European.

**Q160 Lord Tugendhat**: How important do you feel the Arctic region is in relation to Russia’s other policy goals? I imagine it has moved up the pecking order somewhat in recent years, but is this something that is of central interest to the Kremlin or of peripheral interest?

**Professor Geoffrey Boulton**: Let me have a first crack and then the experts can have a go.

What is interesting about the Russian Arctic is that, although an enormous swathe of Russian terrain lies north of the Arctic Circle, it is not obvious to me that there is the same co-ordinated view of the Russian position in relation to the Arctic as there is in many other parts of the Russian landmass. One sees that particularly in organising scientific collaboration where you find that it is good to discuss it with senior bodies, major Russian funding agencies, with whom agreements are relatively readily made. In contrast, at the level of local, provincial agencies, the message of collaboration simply has not penetrated. Because of this latter, undertaking scientific work in Russia is prone to all sorts of appalling
problems in different localities. If you contrast that with some of the scientific work that is going on in central Asia, it is rather different. People in localities, local provincial governors, understand what the position of the state is. Although a major Russian policy report was produced in, I think, 2008 about the Russian Arctic, it is not clear that it has led to a coherent policy towards the Arctic that has filtered down through the various agents of the state.

**Dr Andrew Foxall:** I would add to Professor Boulton’s comments that if not, perhaps, at regional level or sub-regional level lower down in the centralised system, but certainly at the elite level as far as President Putin and President Medvedev are concerned, in terms of the practitioners of statecraft in Russia, the Arctic is of central importance. We must understand that much is at stake for Russia in the Arctic. This leads to Russia adopting quite proactive policies there. Part of this stems from a belief in the Kremlin that perhaps the chaotic state of post-Soviet transition in the 1990s led to Russia being left behind to a certain extent in the Arctic, but there is also, I think, a belief that the status quo does not benefit Russia with its newly consolidated power. That needs to be set in the broader context. In the 1990s, Russia’s policy towards the Arctic was quite haphazard. It concentrated on a number of things. It was by no means coherent. That started to change in the early 2000s. The submission to the United Nations under UNCLOS in 2001, the endorsement of an Arctic policy in 2001 and the general increase in interest lead up to 2007 and the planting of the flag on the Arctic seabed and the adoption of an Arctic policy in 2008. In a historical context, the Arctic is important and continues to be important. One must also understand that the future of Russia’s economic policy effectively rests on the exploitation of hydrocarbon reserves in the region.

**Tim Reilly:** I totally agree. I think it is a critical national security and policy interest. I would say it is part and parcel of trying to maintain the CIS. I do not believe that it is a question of
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

trying to re-invent the USSR, but it is about trying to keep the CIS together and therefore it is taken as seriously as events we have seen in Ukraine and to a lesser extent in Georgia and the Caucuses some years ago in terms of sovereignty. I think that it is certainly critical.

In terms of other policy goals, virtually every other policy goal dovetails into the Arctic. If you look at resources—energy—it is the Arctic. Ninety-five per cent of the gas in the entire Arctic is in the Russian Arctic. When you say “the Russian Arctic” I would prefer to say, “the European Arctic” because the European Arctic is the Russian Arctic. That should be made clear: the enormity of 4,500 miles of coastline.

In terms of increasing international relationships with China—I think that we may come to that later in the discussion—a strategic relationship is clearly possible in the Arctic. Energy, whether evacuated into the EU or around Asia, is part of it. In terms of vital national interests, it is certainly right up there, and we should never forget that there is still a nuclear capability in terms of military assets. This is still one area of the world where the Cold War never went away. It may have waned, but that capability is still there. Incidentally, so is the US’s and I would imagine so is ours. For all those reasons, plus what Andrew touched on on the regional side, it is seen as critical. In terms of Murmansk and Archangel, and the amount of money that is there, a lot of it is in co-operation with the Scandinavian countries, such as Norway and Finland, where there is full integration at the economic level, not just at the oil and gas or political level.

**Lord Soley:** You said that it was more about holding the CIS together. I am puzzled because I am very well aware of the Russian concern about that in other areas, but not so much in the Arctic.

**Tim Reilly:** Historically, if you go back to the 19th century with Mackinder and the theory of geopolitics, which Professor Dodds can obviously wax lyrical about with his experience, there
was always a suggestion that the Eurasian landmass was critical. In the 20th century, that meant that Russia had Europe on one side, America on the other and Asia to the bottom, but now, in terms of international interest, the way that the Russians see it is that geopolitically they are now exposed, in terms of the Eurasian landmass, to the north. As the ice melts, that is now a geopolitical weakness for them, and therefore something that they take very seriously.

**Q161 Lord Addington:** This question follows on quite nicely. Can the Arctic and international relations and co-operation in the Arctic carry on in the light of tensions in other regions? How do those tensions outside the Arctic region, most obviously in Ukraine, affect the Arctic region and co-operation and activity up there?

**Tim Reilly:** This is a critical question. The fact of the matter is that international relations and co-operation with Russia in relation to other nations is already under tension because of the sanctions. For good reasons or bad reasons, for purposeful reasons or unintentionally, a linkage has been made by the West in response to Ukraine by linking our response in terms of economic sanctions with another part of the world, namely the Arctic. De facto, we have done that. The short answer to your question is, yes, tensions have been created in response to the situation in Ukraine. I am not sure whether Brussels and Washington considered that the economic sanctions that were geographically contained and economic specifically targeted would get a geopolitical and strategic response from Russia because from the Russian point of view, they now see a culmination of sanctions, now including gas sanctions, which are extremely important, as opposed to oil, which is immediate revenue, of course. They see this geopolitical point about the north now being open with us putting NATO-type forces into Poland and the Baltic states and they see the attack on Gazprom as symbolic, with Gazprom essentially representing 45% of Russia’s GDP. So they see three
strategic aspects of the Arctic now being attacked in one economic move by the West which, intentionally or otherwise, will, in my opinion, be responded to in a strategic and geopolitical manner, not in a tactical manner. I think that the repercussions of this were meant to be contained economically, but I believe the Russian response will be uncontained and international, geopolitical and strategic in response. I do not think that we will see anything to endorse or qualify that, or indeed to prove it, until, perhaps, the American chairmanship of the Arctic Council in 2015 and next year when drilling can restart in the drilling window in the Arctic Ocean. Then I think that we will see moves that could be quite severe.

**Lord Soley:** Is it your judgment that the Russians would like to keep the Arctic Council out of the wider issues, even if, for the reasons you have just given, not entirely?

**Tim Reilly:** No. My overall point today would be that if by sanctions and military escalations we begin to look at the remilitarisation of the Arctic as opposed to the economic securitisation—oil and gas companies want security, HSE, oil spill response, criminal behaviour or whatever—

**Lord Soley:** President Putin mentioned on a number of occasions before the Ukrainian crisis and the sanctions an intention to expand the military presence in the Arctic.

**Tim Reilly:** So have the Canadians. The Americans are looking at it.

**Lord Soley:** I am simply saying that that was happening before. It is not new.

**Tim Reilly:** Of course. That was partly in response to the development of the north-west district, where a lot of the activity is, especially oil and gas and minerals, the co-operation between the region and Murmansk and Norway, and partly in response to some western pressure that we need to control regulation, sovereign rights, human rights, legal and UNCLOS enforcement and to Lloyds looking at some insurance aspects. They realised that they had to get their game together. Partly also, a third reason for that militarisation, aside
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

from any possibly military/strategic reason, was that as the northern sea route develops, it becomes a national security aspect, rather like we have Royal Marines looking after our North Sea oil rigs and Faslane for the same reason that they are strategic vital interests to the country and therefore security needs to be maintained.

I do not believe Russia wants NATO in there because of the effect it would have, the intellectual contradiction it would pose to the raison d’être of the Arctic Council, in that the Arctic Council is concerned with sovereign rights, and NATO is concerned with sovereignty. The whole purpose of the Arctic Council was to reduce geopolitical tensions by reducing matters to ones of science and legality and by politicians talking, but NATO is responsible for sovereignty, territory, boundaries and borders. That is the absolute opposite of what the Arctic Council is about, so I think the Russians would be very against NATO, perhaps on military grounds, but especially because of the effect it would have on the efficacy of the Arctic Council for everybody in the Arctic.

**Professor Geoffrey Boulton**: From the perspective of scientific collaboration, matters do not seem to be quite so dramatic.

**Lord Soley**: Perhaps I may return to the science soon, because I have a couple of key questions.

**Professor Geoffrey Boulton**: Going back to your question on whether events elsewhere in the Russian sphere of influence have had an impact, and looking at the pattern of collaboration over the past year or so, the impacts on scientific collaboration have been relatively slight. For example, there was a major UK-Russia bilateral meeting in Moscow last December. In the aftermath of that we were advised by the FCO to take our foot off the accelerator. Recently we have had an invitation from our Russian collaborators, including a
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

body which now calls itself the Russian Academy of Sciences, and major funding bodies, for another bilateral on major Arctic issues in St Petersburg in November.

So although there are some perturbations, on the whole collaboration seems to continue.

My view is that we should think very carefully about how to maintain that collaboration.

**Lord Soley:** And would you put your foot back on the accelerator perhaps?

**Professor Geoffrey Boulton:** Yes.

**Q162 Lord Hannay of Chiswick:** I come back to some points which left me fairly baffled in Mr Reilly’s evidence. You take as your point of departure the imposition of sanctions but, of course, sanctions were not the point of departure. The point of departure was the seizure of the Crimea and the destabilisation of eastern Ukraine, all of which are in contravention of international agreements and obligations. It does rather put a different light on it. I understand that you are giving us a very helpful account of what it looks like from the Russian point of view, but that is not the only point of view. The question we are dealing with at the moment—we will come to others later—is whether one can keep the co-operation in the Arctic, as the last witness said, reasonably separate from any tensions, which could well get worse and are not terribly likely to ease any time soon; presumably, if that can be done, it is in our interest?

From what you said, I am not sure whether your answer was yes or no. When you talked about the Russians taking a strategic point of view, are you suggesting that they will retaliate against what they see as western policy over the Ukraine and Crimea by reducing or preventing co-operation in the Arctic? Or do you think that they will be inclined to foster continued co-operation in the Arctic despite the difficulties? It would be helpful if you could say which side of that you are suggesting.
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

Tim Reilly: I think that it would like to maintain relations in the Arctic and that perhaps all of us would like to differentiate between the illegal activities in the Ukraine and the economic sanctions in another part of the world called the Arctic. I am putting forward a view that perhaps one of the ways in which we could do that over the longer term is to consider the concept of the economic sanctions in the Arctic being considered within the Arctic Council as opposed to another international forum.

The NATO side I mentioned was that Russia sees not just the sanctions but also, contemporaneously, the movement of troops into Poland and the Baltic states, as well its feeling about an attack on Gazprom, as an attack on the entire economy of Russia and not simply on the specific gas industry. As it produces roughly 40% of GDP for the Russian Government, it is seen as a much broader thing. Russia most certainly sees that as a threat.

I agree that it would prefer NATO not to be there because, in its view, that begins escalation towards militarisation. I see that the Arctic Council would love to solve these problems, as I think we all would. My view is that the effectiveness of the Arctic Council has been amazing, including its effectiveness between the Russians and the Norwegians with the Barents Sea agreements some years ago after 40 years of conflict. It has kept to all the rules. According to UNCLOS, its application for the Commission on the Limits of the Continental Shelf has gone through. There is every indication that Russia respects what goes on in the Arctic Council. As it does not discuss strategic matters in NATO terms but in terms of policy, science, what we need to do and legal aspects, that may be a framework within which we could look at this issue. I would try to differentiate what is happening in the Ukraine from what is happening in the Arctic.

As I have said, my general point is that the repercussions of the sanctions are broader than first considered. In essence, they were economic sanctions but, in my view, the Russians
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

have seen them as economic and political. Therefore, their response in the Arctic will be different. Yes, they are two separate issues but the Arctic Council could be a very useful tool going forward on sanctions in the Arctic. What happens in Ukraine is a separate question which I am not qualified to answer.

Dr Andrew Foxall: Thank you. Perhaps I may go back to the original question. The impact of geopolitical tension and elsewhere will neither be straightforward nor equal across the Arctic. In many respects, the impact is to be determined by the Arctic states themselves. Some states may decide to use the region to penalise and further punish Russia. Colleagues no doubt will know that Canada boycotted the Arctic Council meeting in Moscow in April. Alternatively, others have spoken of using the Arctic as an area of co-operation to renormalize relations with Russia.

It is also worth remembering that relations in the Arctic were not really affected in the aftermath of the Russia-Georgia conflict in 2008. The Arctic provided an arena in which to renormalize relations with Russia at an international level. Whatever one thinks about the invasion and annexation of Crimea and the destabilisation of eastern Ukraine since then, the opportunity exists, if the Arctic nations want to use it, to further engagement with Russia or to further isolate Russia.

Q163 Lord Addington: Would you suggest that the Arctic provides an opportunity for normalisation and a step back from this situation and the rest of Russia? Clearly, the two are connected but it is a case of how far they are connected. We might be able to have intermediaries who, even if they are involved, are not seen to be at the forefront. That might be a way to continue activity in the Arctic and possibly lead to a conduit for other sorts of information.
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

Tim Reilly: I have thought long and hard about this. I think that the international forum, the Arctic Council, has been successful. It was expressly set up to deconflict issues of territory and sovereignty to reduce the tensions geopolitically between what was then the two superpowers. The way that it works through a scientific and legal framework—namely, UNCLOS and the work that Professor Boulton and people like him do—is an excellent starting point perhaps. It may be technically impossible between Washington, Brussels and Moscow but it seems that among people who consider the Arctic this may be a forum that is well respected by all members and has a successful track record. Russia has never deviated from any policy, doctrine or mandate of the Arctic Council since its inception.

Lord Soley: That is a very interesting point. I want to move on to the science bit in a moment, but that is very interesting. I share the view to some considerable extent that, if you think about it, Russia also has a feeling that it lost out in the Arctic with the collapse of the Soviet Union in a whole range of ways. For Russia there is a historical feeling that perhaps is not always recognised elsewhere.

Professor Geoffrey Boulton: I have become aware of deep concerns in some members of the Arctic Council about the way in which enhanced industrial and commercial exploitation of the Arctic as a consequence of sea ice retreat and warming could seriously perturb the deliberations of the Arctic Council. It has hitherto concentrated on issues of sovereignty, which you have already discussed, but also the environment, indigenous peoples and the like. Some of the conclusions of that work have been rather profound. However, as soon as major pollution as a consequence of industrial activity impacts on the natural environment there is the potential for making what has hitherto been a relatively safe arena for discussion into a much more problematic one. For example, one thing that almost brought the Arctic Council to its knees some years ago was the issue of massive industrial pollution from some
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)
of the heavy-metal mining in the northern part of the Kola peninsula, with down-wind
effects that were very dramatic indeed. None the less, these were ultimately successfully
managed. There are now concerns resurfacing that precisely that sort of issue might blow up
into something much more serious and much more significant, and might actually be very
difficult for the Arctic Council to cope with.

*Lord Soley:* That is a useful warning. Thank you.

**Q164 Lord Oxburgh:** We have touched on science and its importance, and indeed the
possibility of separating science and regarding it as something discrete from the other
aspects of activity in the Arctic. But what I think is beyond dispute is that there is going to be
more human activity in the Arctic. It is going to take place in a very large area that is rather
poorly understood from a broad environmental and scientific point of view. Professor
Boulton, would you like to comment on where you think the major gaps are and what you
think might be done about them?

*Professor Geoffrey Boulton:* One of the major gaps results from the demise of the Soviet
Union. In the Soviet era there was a whole series of research stations stretching the whole
way across the Arctic littoral of the Soviet Union, which were concerned with monitoring
river flows, establishing pollution levels, establishing ocean circulation, understanding sea
ice dynamics and understanding marine and terrestrial ecology. The break-up of the Soviet
Union led to the demise of many of those stations. Although many are now being re-
established, there is an enormous data gap. There is currently a great void in what we might
have hoped to have had at hand. The time-series evidence, which is crucial in establishing
the benchmark for all sorts of environmental and scientific work, is simply missing. One of
the things that has been happening is that western countries have been heavily involved in
trying to redevelop those capacities. For example, interestingly, one of the most effective
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

collaborations is with the US in re-establishing a hydrometeorologically and ecologically important station in the eastern part of Siberia. Russia likes to do bilateral relationships. It is much less happy in big consortia outwith the Arctic Council.

One of the problems is recovering capacity to monitor what is happening both in the Arctic littoral and also in the shallow marine domains. They also had ice stations. There is one remaining Soviet ice station in the Russian Arctic, which is invaluable in giving surface information that we can use to understand better the imagery available from satellite observation. Although during this period satellite information was still being collected, without ground evidence and ground monitoring it is much more difficult to use. One of the large issues for the Arctic Council, which they have begun to address, is how we go about recovering capacity to understand what is happening and what might happen in the Arctic domain under circumstances where the Arctic environment is changing dramatically as a consequence of warming and sea ice retreat.

There are big scientific problems. My view—I think the Society’s view—very much is that there is a big opportunity here for us to engage in a fundamental way in an area of the earth that is changing probably more rapidly than any other and is going to suffer from very important human intervention. We will need understanding that will then help us to utilise the Arctic in a “sustainable” fashion. There is a big opportunity if we can exploit it, but we have to be careful about Russian sensitivities. We should learn from those who have collaborated well with the Russians. For example, the Germans have a long history of strong collaboration. The Humboldt-Institut currently has a major collaboration in Russia that is running very well. They have a large marine geophysical and oceanographic capacity in the North Atlantic and Norwegian Sea and are thinking about ways in which they can engage with the Russian scientific effort that will not embarrass the Russian position, which does not
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

like the idea of others becoming involved in the Arctic outwith the Arctic Council grouping. There are large opportunities, but some serious problems.

**Q165 Lord Oxburgh:** You have touched on the gaps and the science politics, if you like, but what about the scientific gaps at sea? This is an area that is very poorly known and requires oceanographic vessels and sustained international activity. Setting the politics aside, what would you like to see done there? You have to decide what you want to do scientifically, if you can, and then try to work the politics round it.

**Professor Geoffrey Boulton:** The priority is to understand what the causes of change in the Arctic are. We have a reasonable idea, but the large question is what the consequences of change are going to be. The Arctic ocean and atmosphere systems are strongly coupled with what happens in the North Atlantic region. About 60% to 70% of the heat transport in the North Atlantic region towards the poles takes place in the ocean, which is crucial in influencing our climate and weather. We need to understand what the consequences of Arctic change might be for circulation of the ocean in the Atlantic and climate.

What would we like to do? Well, of course, at the moment there are major oceanographic efforts. The UK is heavily involved in an effort across the North Atlantic, trying to understand the heat transports across into the Arctic ocean, the southward flux of Arctic water, the ecological consequence for fisheries and the like, but actually, we need to penetrate much deeper into the ice-covered part of the Arctic Ocean and into that part of the Arctic Ocean that is now seasonally ice free. That is where arrangements with Russia become crucial. It has been extremely difficult in the past to develop oceanographic cruises in the Russian parts of the Arctic. The Swedes have recently been successful in arranging for one of their major icebreakers to have a cruise across the Russian continental shelf. It took them two years to negotiate it, but that is better than the efforts they made 25 years ago to celebrate
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

100 years since Nordenskiöld first went across the Northeast Passage. The Swedish Government made overtures to the Soviet Government for about 10 years; not a single letter was answered. Things have been getting better, but there is still great sensitivity about moving into Russian-controlled waters.

**Lord Oxburgh:** Do you think ocean drilling is out of the question?

**Professor Geoffrey Boulton:** No, I see no reason why it should be out of the question, but you will know very well the susceptibility of fixed platforms to moving sea ice. On the other hand, of course, we do not need to think entirely about fixed platforms anymore, because increasingly we are beginning to think that we can replace the role of many of the research vessels by remotely controlled devices. We already use those on an increasing scale in the North Atlantic; and there is no reason why we should not use them under Arctic sea ice. But again, the issue of sovereign control matters a lot. These things have to be done as part of international agreements. I think that we can do things with new technologies that do not require us to penetrate using surface vessels.

**Lord Hunt of Chesterton:** I would just like to comment on your comment about bilateral agreements. In 1977, I went to Russia on an Anglo-Soviet agreement. It was a bilateral agreement and very effective. That is obviously the German strength. They like bilateral agreements. That may be something we should think more about.

The other point that I was going to make is that people sometimes simply do not appreciate that there is still a great deal of excellence in Russian science. It is very important to recognise that. Our friends in the MoD are the only part of the British Government where you have a department that looks at foreign research in order to apply it, and they speak Russian there. There is very significant capability. In detecting earthquakes from satellites, for example, it is unique. Nobody else believes it is even possible.
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

The question is how we can improve the understanding in the UK science community of working with them. Is this something for research councils and government departments? The Anglo-Soviet environmental agreement in the 1970s was supported by the equivalent of Defra, the DoE. Government departments realised that they would benefit from this. I wonder whether you have any ideas about how we can make this collaboration broader and deeper.

**Professor Geoffrey Boulton:** It is important to recognise that Russian science is not uniformly good and that there are areas where they would regard their science as of high quality and many of us outwith Russia might think rather differently, although of course there are some areas of truly excellent science. My first suggestion is that rather than attempting to develop large-scale, ambitious government-to-government programmes, we should be sensitive to the way Russian scientists and their funders like to work by developing relationships with specific groups. There is a great deal to be said for supporting such activities and developing effective ways of working with appropriate funding. One of the problems is that there is a really serious language problem. In this country, we stopped teaching Russian in the mid-1980s. It just collapsed in two or three years. Our Russian-language capacity is now rather poor and there is certainly no uniformly high level of English capacity in Russian scientific establishments. It is a serious matter.

There is also the matter of visas. There one gets two completely opposed positions. If you ask the FCO whether there is a problem, it would say that there is some minor bureaucracy but there is no problem. If you ask many individual scientists, they say that the problems can be very severe. At the moment, it is rather anecdotal. We have tried to establish on a quantitative basis just how much the visa problem matters. Certainly many scientists who are engaged with Russia take the view that it is pretty hit and miss whether you get your visa
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

to go in or your visa to come out. It is not entirely on our side where the problem lies; there are serious Russian problems too.

**Lord Soley:** Before I move on to Lord Moynihan, when we were on the Norwegian Island of Svalbard, where we also have the science research station at Ny-Ålesund, we were told that the Russians were planning to open a science base on the island. Can you see any advantages or possibilities of co-operating with that base through Ny-Ålesund?

**Professor Geoffrey Boulton:** I think the plan is that the Russian base will be at Barentsburg, which is a desperately dilapidated coal-mining station that has not mined any coal for probably a couple of decades.

**Lord Soley:** I think it does mine some, but it is very minor.

**Professor Geoffrey Boulton:** Well, the belief in the Norwegian community is that they import coal to Barentsburg in order to show that they are exporting it, but never mind. I think it is unfortunate in a sense that they are planning to place this at Barentsburg rather than at Ny-Ålesund. It would have been wholly better had it been there. On the other hand, if a well-found station is created there and brings good Russian scientists to Spitsbergen, there is every reason why we should attempt to work with them at Barentsburg, because that physical proximity matters a lot.

**Q166 Lord Moynihan:** The planting of the Russian flag on the seabed at the North Pole has been interpreted in three ways in evidence given to us. The first is as a purely symbolic act, the second is as a critical scientific and in the end fraught but successful expedition to meet UNCLOS criteria for the territorial claims of Russia—incidentally led by one of the world’s leading scientific explorers in pursuit of that goal—and thirdly as both. I would be grateful for your views on that. At the same time, if you give any credence whatever to the UNCLOS
element to that expedition, what do you see as the legal ambitions and expectations of Russia regarding the Arctic seabed beyond its exclusive economic zone?

**Dr Andrew Foxall:** I understand the Russian act of planting its flag in both ways. It was in one respect little more than a sideshow to a serious scientific endeavour that was, as I am sure colleagues know, to collect the data that were missing from its 2001 submission. It also had symbolic resonance domestically. This came little more than a few months after Putin’s speech at the 2007 Munich security conference, which was understood as an aggressive speech, when he laid into the United States and accused it of trying to establish a unipolar world system and so on. That domestic narrative falls apart in a number of respects. Let us not forget that this was not the demonstration of Russian strength, nationalist fervour and endeavour that it was portrayed to be. It was not simply the Russian state, it was the Russian state with a number of international partners. The Swedes and the Australians were there and provided much needed technical support in search and rescue and so on and helped to finance the initiative.

With regard to Russia’s territorial ambitions in the Arctic, I echo what the Chairman said earlier. During the Soviet period, the Soviet Union controlled approximately one-third of the Arctic Ocean. Russia believes that during the 1990s in a sense the West was devious and took some of what Russia believes to be its territorial waters away from it, and it now seeks to reclaim them. Its 2001 application to UNCLOS is part of that. Earlier this year, UNCLOS recognised part of the Sea of Okhotsk near Japan to be Russian territory so that Russia now controls the whole of Sea of Okhotsk. Exactly what will happen on the decision on the 2001 application remains to be seen, but I imagine that if it does not go in Russia’s favour, Russia will simply provide further science that would lead to a revision of the decision such that it may well then go in its favour.
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

**Baroness Symons of Vernham Dean:** Can I ask a question about this flag business? You said that the Swedes and other Nordic nations were on the same expedition and were there when the flag went in. Did their flags go in as well?

**Dr Andrew Foxall:** They did not, but it is worth noting that other Arctic states have planted flags previous to that. Canada, for example, planted a flag in 2005, I believe, and there was not the same overreaction to that.

**Baroness Symons of Vernham Dean:** It would be interesting to know about those other precedents, please, if you have information on that, because this is obviously quite a symbolic issue.

**Tim Reilly:** At the time, I wrote a letter to the *Times*. I was at the Scott Polar Research Institute at Cambridge at the time and I wrote this letter saying that we had to be very clear that Russia putting a flag on the Arctic Ocean was about as significant as the United States putting a flag on the moon. It was absolutely fine: they had worked hard and provided the science and the personnel. In this case, as Dr Foxall said, it was partially financed by the West and there were a lot of scientific personnel on board. Artur Chilingarov himself was very surprised. In that sense, the politicians—in this case, President Putin, as Dr Foxall said— took full advantage of this coup, but Artur Chilingarov has said that he was totally surprised and he was actually the father of Arctic ice stations in the 1950s and 1960s. He is a very serious oceanographer and Arctic specialist. In terms of UNCLOS, yes, they are applying to the Commission on the Limits of the Continental Shelf, but so are Canada and other countries, all pushing out towards to the North Pole. In one sense, it is significant politically to be there, but in terms of economics and resources there are no known hydrocarbon resources that far out into the Arctic Ocean.
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

Baroness Symons of Vernham Dean: So your view is that the Russians are not any more territorially ambitious than anybody else.

Tim Reilly: They are no more so than anybody else; there are other people applying to the CLCS right now within the Arctic Council who are making similar appeals. None the less, it would give them sovereign rights. Again, it is very important to differentiate between sovereignty, which they would not have, and sovereign rights, which they would have. But, of course, sovereign rights would still be subject to freedom of the seas, innocent passage and all the other aspects of international maritime law. In some ways, it is symbolic for all nations within the Arctic Council to push as far out as the North Pole. However, with change in weather and ice melt, and the NSR perhaps in the end being overtaken by a route right over the Arctic, that may change in terms of politics, but it is far too early to see that.

Lord Soley: It is an important area, but if it is any comfort to you, Mr Reilly, we British politicians at least have learnt the dangers of planting flags on things, although we did do Rockall a few years ago. Dr Foxall, did you want to come back on this before we move on?

Dr Andrew Foxall: I did, just very briefly. If one were to understand the act of Russia planting its flag as the high point of what at the time was being called a ‘new Cold War’, as part of that wider timeline of aggressive events and actions by Russia, it would also be true to say that, since 2007, things have actually gone in a remarkably peaceful direction in the Arctic—the Ilulissat Declaration; the maritime delimitation treaty with Norway; and the 2011 signing of the first legally binding treaty. If that were the high point of the confrontation, then we are at least over it now.

Lord Soley: It is difficult to get the balance right on how to react to these things at times.

Professor Geoffrey Boulton: Just to interject a little historical perspective. It is easy to underestimate just how much Russia associates itself with the Arctic. It has historically felt
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

quite free to express its views trenchantly. Of course, in this regard, it has done much of the important geological work, both on the continental shelf in establishing its extent and up to the pole. I have no doubt whatever that Russia intends to make a sea bed claim up to the pole, as will other nations. So I do not think that we should overegg this one. As you have said, we have done a bit of flag-planting ourselves.

**Lord Soley:** We covered the world in them at one stage.

**Q167 Lord Hannay of Chiswick:** I wonder whether you could tell us what you think Russia’s intentions are towards the mineral resources, both onshore and offshore—and I am not talking just about oil and gas—in the Arctic, and when and where further developments are likely to take place. Perhaps you could comment in that context also on how capable the Russians are of developing mineral resources in the Arctic without foreign collaboration and investment or whether they need western, Chinese and perhaps even Vietnamese association with these mineral ventures in order for them to be viable.

**Dr Andrew Foxall:** I will start by making the broad point that Russia does a good enough job of telling us itself what it seeks to do in the Arctic. We could simply refer to a number of, if not several, Russian policy documents that stress the importance of the exploitation of resources—not simply hydrocarbons but also mineral resources—in terms of strengthening Russia’s position and its influence in international affairs and on the international stage. As I noted earlier, Russia’s future economic model is in a sense based on what it can get out of the Arctic resource-wise at whatever cost is economically viable. In a number of respects, because of the Soviet Union’s experience in the region, as Professor Boulton alluded to earlier, Russia starts in a position of strength, certainly where hydrocarbon resources are concerned. I see no reason why that would not change in the future.

**Lord Hannay of Chiswick:** Why it would change?
Dr Andrew Foxall: Yes, why it would change.

Professor Geoffrey Boulton: There is a great diversity of potential for mineral resources, not restricted to continental shelves but also in the deep ocean. Many countries are seriously making or preparing to make investment in the technologies required to mine minerals in the deep ocean, particularly along mid-ocean ridges, where valuable minerals occur in concentrations that are far higher than found on land. The Russian difficulty at the moment is partially one of investment and partially one of technology. Inevitably, many of the large-scale marine devices and ship-borne devices required to undertake not only deep-ocean mining but other aspects of mining on the shelf are likely to come from Asia. There are certain sensitivities that I am aware of, particularly about Chinese involvement in the Arctic, which I think the Russians would not necessarily welcome—although I believe that they have recently struck up an important agreement with South Korea to provide them with marine capacity that they currently do not have.

Q168 Baroness Symons of Vernham Dean: The next point that we wanted to raise was that which you just raised, about the greater involvement not only of China and Korea but of Japan and Singapore. How are the Russians reacting to that? Are they holding out the hand? I want to come back to the differentiation over what is science and what is not, but, on this, are they embracing these new partners?

Professor Geoffrey Boulton: I look to my colleagues on my left first.

Tim Reilly: Within the Arctic Council, once again, it was recognised that, in terms of the massive infrastructure requirement within the Arctic in order to exploit the economic opportunities and to provide a livelihood for indigenous peoples and the rest of it, there had to be sustainable finance coming from somewhere. The other aspect of it, as Professor Boulton has alluded to as well, are some of the climate and weather effects that are going
The Arctic is at the epicentre of these changes. The effect on climate is felt now not only within the Arctic but without the Arctic. Countries like China are saying, “This is actually affecting currents, tides and solidity of water in our waters, or will do. Therefore, we have a right to be there”. So there is some justification in this. External countries are saying that, because the Arctic is the epicentre of climate change on the earth, they have a right to be involved in the solution to it and in the endeavour to find out in terms of hard science. The second part of this is the way in which this is looked at by the Arctic Council—Russia does not disagree with it. It is pretty implicit to observers now, including the United Kingdom, that if you want to join the party, you must share the burden and ask what you bring to the party. One of the smartest things, and it is why I think that Asia will have a place here and possibly with Russia because of the circumstance of sanctions, is that the Chinese have produced a manual for the northern sea route, with navigation, communication, and depth of ports, water and all the rest of it. It is a small move—it will cost them a couple of million dollars to do—but it is a very clever move. It is saying, “We are arriving in the Arctic and we are immediately contributing to the new global trade route for the future and, in the mean time, something that may well be used for evacuation of oil and gas via LNG from places like the Kara Sea out to the Asian market”. So burden-sharing, infrastructure and the fact that Arctic conditions are changing and now affecting outside the Arctic as well as inside are all reasons that, sooner or later, the Arctic Council—including Russia; I do not think that there is any contradiction here—will see the inevitability of it. I think that each individual state within the Arctic Council favours it more or less. For instance, Greenland finds it quite attractive; I would not say that Iceland is being seduced, but it is being courted heavily. Both Greenland and Iceland are like China; countries like America will take a different view. Russia
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

has always had difficult Sino-Russian relations, but, on the other hand, understands now, especially given the sanctions, that the opportunity is there.

**Baroness Symons of Vernham Dean:** So the Russians are more embracing than not?

**Tim Reilly:** I would have said so, yes.

**Professor Geoffrey Boulton:** I think that Russia likes a cosy Arctic Council setting and is rather wary of external interests.

**Baroness Symons of Vernham Dean:** Another major player.

**Professor Geoffrey Boulton:** A point that I think the Chairman made relates to this: what are the legitimate reasons for non-Arctic states taking an interest in the Arctic? Climate change is the obvious one, but something that exercises a proportion of Russian scientists, although by no means all, is what they call the potential for a methane catastrophe. There are two potential sources for this. One is the permafrost on land. Russian scientists, who have been looking at permafrost for the best part of 200 years, reported about 15 years ago seeing for the first time in temporary winter lake ice little bubbles containing methane, suggesting that sodden or frozen vegetation in the permafrost was being released from it and methane was being exhaled. Of course there is a much larger issue there, as the solid methane—the frozen methane, if you like—that is contained under many continental shelves along the Arctic rim could well be released if the Arctic were to warm to a particular level. The impact of this would be substantial as methane is a greenhouse gas about 1,000 times more effective in warming the atmosphere than CO₂. This has become a rather political battle in Russia in that, for reasons that I do not understand, there have been reports in parts of Russian science, often from very senior people, saying, “Look, we must put this issue to one side. It is an apocalyptic issue that really is not very likely”. You have as much chance of guessing why they should take that view as I do.
Dr Andrew Foxall: I agree with what Professor Boulton said—not about the methane catastrophe because that is something that I know very little about, but about his first point. Russia, like Canada, opposed the expansion of the Arctic Council on the basis that Russia has long argued that the Arctic is of regional rather than international concern. It has opposed the expansion quite consistently over a number of years, not least because it was worried about the commitments and rights that future members, participants and observers would necessarily have. Perhaps one of the reasons why Russia has allowed the expansion to take place recently is that, whatever one thinks in the West, Russia is wary of the growth of China and its emergence as a superpower, and allowing China into the institutions and architecture, in effect, of the Arctic Council means that China acknowledges the council’s legitimacy, so that if China ever wanted to make any claims in the Arctic it would have to do so through the Arctic Council itself.

Lord Soley: That is a useful reminder that international relationships change from time to time.

Lord Hunt of Chesterton: Can I just make a point about those two interventions? The first is that there was a significant meeting at the Royal Society in September, where it was quite remarkable that the United States scientists who had been quite sceptical about the connections between change in the Arctic and climate variations further south over Europe, Asia and America have switched their position and now see that this warming of the Arctic leads to these very large gyrations of the jet stream that form large circles of blocking or permanent events. This question of climate over the Arctic and further south is now much more validated scientifically. That is just to make your point—there is a political ramification. The other point is that when the Arctic climate assessment was produced—I was there when it was presented in Reykjavik in 2004 or 2005—there was great reluctance then to make any
comments about the permafrost, the methane and so on. In particular there was an American scientist who was very opposed to that discussion. Now, though, that is very much more on the table, although again there are arguments about who is doing it and how it is being done. However, it has still not actually been incorporated into the climate models. That is a historical political point. Currently there is a great move for all the international climate bodies to begin to recognise this. The political ramifications of that, as you commented, are quite large, and we can have not really seen the consequences.

Lord Soley: Professor Boulton, do you wish to respond to that?

Professor Geoffrey Boulton: No, the point was well made.

Q169 Baroness Browning: We have heard about the military build-up in the districts in Russia that border the Arctic, and we have heard again this afternoon about Russia’s awareness of its exposure to the Asian land mass to one side of it, but with regard to the response that it had from Canada this year in response to its proposal to form an Arctic military command by 2017, should the West or NATO be worried? How are you interpreting the escalation, which seems to be quite rapid, in this area?

Dr Andrew Foxall: To put this into its broader historical context, the post-Cold War period as a whole has seen quite a marked demilitarisation of the Arctic itself, but it is true to say that over recent years, as your question suggests, Russia has undertaken a remilitarisation of it. That has been particularly pronounced since 2008 and the military reforms undertaken by the then Defence Minister Anatoly Serdyukov. The Russo-Georgian war was a success as far as Russia was concerned but revealed issues with Russia’s military that since then it has sought to address, and that has involved a modernisation of its military not seen in the West for over a decade. Russia’s plans in the Arctic together with its plans, its build-up and its military manoeuvres, elsewhere should rightly be alarming the West, but I would caveat that
by saying that, as Professor Boulton alluded to earlier, given Russia’s size in the Arctic, the size of its coastline in the Arctic and its number of large Arctic settlements, Russia has legitimate reasons for undertaking the securitisation of the region. However, I would distinguish between the securitisation and the militarisation of the region.

**Tim Reilly:** It is quite instructive to note that the incumbent Minister of Defence, Sergei Shoigu, was previously the Minister of Emergency Situations in the Arctic. Under him, and along with Putin, way before Ukraine, Russia had already decided that it would need a military capability. For clarity, it is important to point out here that for all militaries and navies in the Arctic, the fundamental problem is that there is no private security. They do not have the logistical support, the training and all the rest of it, so the only people who can provide security to some extent—ring-fencing health and safety issues, oil-spill response or emergency evacuation—are military people. We are all the same; the Canadians set up a formation like this in their Arctic with a specialist brigade, port facilities, ships and all the rest of it. Again, it is important to be careful in distinguishing between intent and capability here. Certainly there are now two brigades 10 kilometres from the Russian border, there is an airborne division in the air, there is a special forces—Spetznaz—brigade, they have changed the military command and put it into St Petersburg, and they have made it into brigades as opposed to mechanised, difficult-to-manoeuvre divisions, so they have clearly looked at the military. They recently did an exercise right up in the Baltics near Poland, which included the Barents Sea and air aspects over the Kara Sea, where they were looking at a supposed incursion by terrorists into Belarus and the regaining of that. It was obviously about something more than that, and we recognise that. But it is important to differentiate between militarisation and the securitisation for the reasons that I mentioned earlier: that this is now a vital interest and a resource base. The north-west part of Russia and its border
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

with the Baltic states, but especially the Scandinavian Arctic rim countries—Sweden, Finland and Norway—have to be looked at in terms of national security, including the industry there. Shoigu came from the emergency ministries where he was looking at these exact issues. Incidentally, at the very time when the flag was planted, he was talking about what sort of people should be put there to help people evacuate in the event of a potential oil spill. There is certainly something for NATO to consider, but it takes more time to understand whether there is intent because there is capability—whether this is remilitarisation for geopolitical reasons or whether this is a hybrid of commercial securitisation with military. Officially, Russia has said that in all cases the American, Canadian, Norwegian and Russian troops are all dual-task—they are for civilian tasks as well as purely military. I think the answer is that it is too early to say, but the capability is most certainly there, which will have budget implications for NATO.

**Q170 Viscount Hanworth:** As regards an alternative point of view, might we consider the incursions of Russia into Crimea and Ukraine simply as precursors to further territorial adventures or even incursions? I am thinking of a threat to the Baltic states, which all incorporate substantial Russian minorities.

**Tim Reilly:** In a way, that is what I am saying. They have the capability, but is that their intention? Was this a rehearsal for the Baltics or not? Certainly, with Finland they have replaced some of the missiles and are telling the Finns that, if they are thinking about joining NATO, they will put nuclear tips on that. That has come out and the Finns have reported it, and that is close to their border as regards some of their missile launches from trucks.

**Viscount Hanworth:** What I am very aware of is that we seem to want to avoid consideration of these rather extreme and unsettling scenarios. However, we saw it
happening in Georgia and we could depict what happened in Crimea as simply another instance of an ongoing policy of aggrandisement.

**Tim Reilly:** The depressing point along that line is that if you look at the White Sea Canal, which goes from St Petersburg into the Gulf of Finland and cost the lives of 25,000 Gulag prisoners to build under Stalin, that is now a pathway right into the Gulf of Finland from out of the White Sea. There is a railway system there and at one of the cities there is a major depot, with oil and gas interests. It would give Russia the capability—they are enhancing the infrastructure—to adopt an alternative route down through the White Sea, along the White Sea Canal and out into the Gulf of Finland, where they have Latvia and Lithuania to the left and Finland to the right, which would make most people feel quite uncomfortable.

**Viscount Hanworth:** I am mindful of the fact that the Crimean adventure has been hugely popular in Russia and one can envisage a scenario in which Putin is subject to some kind of duress and wishes to boost his popularity by further incursions of that nature.

**Tim Reilly:** I wrote a paper that I think was distributed to the Committee in which I said that the problem Putin may face now is that on the one side most certainly there is evidence of factions within his Government, which he has to balance in the Arctic against international partners with economic interests. At the same time he has to factor in the geopolitical and economic ambitions of Russia in the Arctic, so he has four factors all moving independently. It could go any way, frankly.

**Lord Soley:** Nationalism is a difficult card when you play it. Before I bring in Lord Hannay and Lady Symons, I think that Dr Foxall wanted to come in.

**Dr Andrew Foxall:** I did, on a number of things and I shall try to be brief. President Putin in a sense was always a wartime leader. Let us not forget that he came to power on the launching of the second Chechen war, which led to similar approval ratings that he gained.
when he was Prime Minister after the invasion of Georgia and which are now 86% after the annexation of Crimea and the destabilisation of eastern Ukraine. I do not think that his designs on eastern Europe go much further than Crimea and what we might call “New Russia”, or “Novorossiya”. However, that is not, of course, to say that, if we were having this conversation in Warsaw, Tallinn or Riga, we would not be rightly worried about Russia’s geopolitical designs on the Baltic. If I might bring this back to the Arctic zone and the initial point, yes, Russia’s annexation of Crimea has in a sense drawn attention to its military activities in the Arctic, but its militarisation of the Arctic predates Ukraine and Crimea. Last summer—the summer of 2013—Russia re-established a permanent military presence in the Arctic, for example. I would also note, although it is often overlooked, that whatever one thinks about the Kremlin’s sensitivities, from its point of view it believes that Russia is being encircled by NATO in the Arctic. Russia is the only Arctic littoral state that is not a member of NATO. When Russia talks about its militarisation of the Arctic, it does so—numerous practitioners of statecraft in Russia have argued this—as a way of rebalancing the military situation in the region vis-à-vis NATO. Russia does not see the other littoral states as individual states; it sees them as members of NATO.

Q171 Lord Hannay of Chiswick: Unless I have got this completely wrong, Russia has been “encircled” by NATO in the Arctic sine 1948. It is not something new. It has existed as long as NATO has existed. However, I have a question I want to probe a little more. I am puzzled by the fact that apparently the Russian perception of the activity of this group of western nations is that it always involves NATO. However, if my understanding is correct, NATO as an organisation has gone out of its way not to have a presence in the Arctic, not to have a strategy, military or otherwise, in the Arctic and not to ask for membership of the Arctic Council or observer status, so surely this is a matter concerning not NATO but certain
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

member states of NATO which are clearly littoral states and clearly have the Article 5 guarantee of their territorial sovereignty and so on. It is therefore not true to say that NATO is confronting the Russians in the Arctic, is it?

Lord Soley: Before you respond to that, can I check whether Professor Boulton has a plane to catch?

Professor Geoffrey Boulton: Not yet.

Tim Reilly: You are technically correct, Lord Hannay. I think that the West went to great lengths to emphasise that the force that has been suggested—I think it is a brigade size force—was not NATO but comprised members and individuals put together. I think that it was sending a signal to the Russians that this was not NATO moving in. The point that I was trying to make—Dr Foxall will speak for himself—is that that is exactly where we want it to be. We do not want it to escalate any further than this. The emergence of NATO would happen if things were to go wrong, but I think that the talk about escalation, capability, intent and the rest of it is dangerous from a statecraft point of view. What we all need in the Arctic from an economic, environmental and indigenous people’s point of view is stability and predictability, and this is counter to that, so putting limited forces and air force into the Baltic states and Poland recently, not under the banner of NATO but none the less western countries, was probably inevitable. However, I repeat what I have said before: there may be another alternative forum wherein this can be discussed and the geopolitical tension eased in order that it does not become a case of NATO moving into the north-western sector.

Q172 Baroness Symons of Vernham Dean: I am very interested in the points that Lord Hannay and Viscount Hanworth have raised. Earlier in the discussion, I thought you were critical of the sanctions spilling over into the Arctic in a way that was dragging in the whole of the Russian economy and the other points that you raised. It was as though there was a

65 of 1144
view, particularly from Professor Reilly, that science should stand outside these political developments. I do not know whether that is what you were implying, but that is how your argument came over to me: namely, that somehow science could be isolated from politics, from international relations, from a country breaking the rule of law, from human rights abuses and from everything else that we deplore, and that where sanctions are taken, very often economically and where they are taken in sport, the implication seemed to be that somehow science stands outside that. It was an argument that I could not quite follow, but I thought that was where it was going.

Tim Reilly: I can clarify. What I am trying to portray, and I hope the value of what I am saying, is that, having talked to Russians about what I have said over the past few weeks, their view was, “Yes, you’re on the money. That is how Russia will react to this”.

From my point of view as regards the science and some of the repercussions of the sanctions, for instance, on the oil and gas companies, the amount of money that the oil and gas companies put into science, R&D and technology is in the hundreds of millions of dollars. If they are no longer operating in the Arctic, shareholders and stakeholders will question the various boards of these big oil companies. They will ask, “What are you doing spending money with no return?”.

Secondly, what concerned me about the sanctions, and the limitation and the scalability of them, is that paradoxically in the Arctic the oil and gas industry is one of the only industries that has sufficient capital, skills and infrastructure in place to enable environmental protection and sustainable development to proceed and to monitor business. It is a paradox, but it is they who will build the bridges, the tunnels, the airports, the hotels, the communications and the navigation systems for their own purposes, but it is on that that
environmental protection and good science can take place with data to support how we are going to move forward.

There is another aspect of the sanctions that has an effect on the Arctic Council, if the Arctic Council is to be affected by the sanctions, with Russia being the biggest player. One question being asked by the Arctic Council internally is the purpose of science. Traditionally, it was to support environmental protection measures and to look at an orthology of fish and to understand their breeding patterns and all the rest of it, so that it could put barriers up and so on, as it did in Sakhalin, where the direction and the routing of the pipeline was changed at a cost of many billions of dollars. That was the purpose.

One question which the Arctic Council is asking now through the Arctic Economic Council, the new body, is what the purpose of science is. Is it moving further away? I think Professor Boulton alluded to this as well. There are concerns that the purpose of science will not be directed exclusively any more towards environmental protection but will look towards sustainable development. If it is proved that science can prove the validity of sustainable development in the Arctic, business would have a green light to operate. That business would be energy. Why is it energy? It is because the Arctic Council has publicly stated that the Arctic Economic Council’s primary endeavours economically will be hydrocarbon exploitation.

If the sanctions per se have a negative effect on the Arctic Council and Russia’s position in it, science in the way that I have outlined will raise these sorts of issues. The science could either be sidetracked or undervalued, because if the likes of Shell, BP and Exxon go, who else will supply the money for the research in order that environmental protection can be understood and that we can sustainably develop the Arctic in the form of western business, capitalist business?
Arctic Advisory Group, the Henry Jackson Society, and the Royal Society – Oral evidence (QQ 158 – 172)

**Lord Soley:** Dr Foxall, do you want to add anything?

**Dr Andrew Foxall:** I would add an isolated footnote. Over recent years the Russian state has been cracking down on NGOs and other organisations that co-operate with the West. Only last week, the Russian state took the deplorable decision to end the long-standing Future Leadership Exchange Programme, a multilateral initiative with the US and other members of the CIS. As part of that broader crackdown, I would say that that does not bode well for future scientific operation.

**Professor Geoffrey Boulton:** I would answer Baroness Symons’s question in a rather different way. Historically, science has been able to maintain dialogue, notwithstanding a reprisal and counterreprisal when states find it impossible to talk to each other. Let us not forget that at the height of the Napoleonic wars, Michael Faraday went with Humphry Davy to Paris when Davy picked up a medal from the French academy and had a passport from Napoleon to permit him to do so.

Last year, the Royal Society, together with US colleagues, developed a programme to work on a volcano, Mount Paektu in North Korea which has, in the past, been immensely destructive in North Korea, and is showing signs of renewed activity. We had a joint scientific enterprise, which was just about the only real collaboration that has happened between North Korea and western states. It is not the same thing as BP and Shell getting involved, but it is possible to maintain dialogue and contact. Indeed, during the height of the Cold War there were analogous scientific contacts. So one should not dismiss that. It has important significance.

**Lord Soley:** I think the fact that this session has gone on for 25 minutes more than it was timed for is an indication of how important it has been. As I have said, it is desperately important for everyone that we understand Russia’s perspective of the Arctic. I always see
Russia as a rather tragic country in the 20th century with two world wars, millions dead and injured, a revolution that goes wrong, a tyrant, famine, deportations and the collapse of an empire. We always have to see Russia through that pretty bad history. Having said that, it is crucial that we understand where they are on these issues and do it through that prism. Whether that justifies what is happening in Ukraine or elsewhere, understanding that is critical and you have been very helpful in your answers today. Should you wish to put in any more details, either on the science side or anything else that has been said that you feel has been left out, please do so. If you have any specific recommendations, please send them through. You will get a copy of the transcript, which you can read through. Having said that, I thank you and would like to make sure that Professor Boulton gets his plane back to Edinburgh.
Arctic Advisory Group – Written evidence (ARC0060)

1. **HMG’S RESPONSE TO HOUSE OF COMMONS ENVIRONMENTAL AUDIT COMMITTEE ARCTIC REVIEW**

In the light of the House of Common’s Committee’s findings in 2013, a policy Framework was put in place to accommodate the interests and views represented by various government agencies, departments, and ministries. Overall direction was given to the FCO, which now coordinates 6 monthly meetings with the interested parties to review and update the Framework.

HMG did not formulate a formal Policy document for the Arctic region for two primary reasons: firstly a policy document was seen to presume upon the exclusivity of the 8 Arctic nations’ sovereignty over the region; secondly, such a document may therefore have invited criticism in terms of any UK Policy content. Instead the Framework set out the UK’s interests in the Arctic, how it could work with others in the region, and what expertise it could contribute to the development of the Circumpolar North.

2. **RECENT DEVELOPMENTS SINCE 2013 THAT MAY EFFECT THE UTILITY OF THE UK’S ARCTIC FRAMEWORK**

- The international implications of sanctions in the Russian Arctic, including UK & NATO strategic considerations
- The creation of a business forum by the Arctic Council (AC), known as the Arctic Economic Council (AEC), as well as the arrival of such business oriented forums, as the Arctic Circle
- The changing role of Science in the AC, adapting to business needs, and sustainable development
- Implications of US Chairmanship of AC in 2015 (on Business/AEC; NATO; Observer membership)
- Review of the AC’s role and mandate(s), in light of the above changes
- The increasing appointment of Arctic representatives, by non-Arctic Observer countries
- Increased EU interest & participation in the region, as well as a possible granting/not granting of its “Permanent Observer” status within the AC in 2015
- Increasing Asian / Chinese interest in the European Arctic for shipping, energy reserves (especially Russian gas). Their new Permanent Observer status in the AC, and the implications for the UK’s Observer status - and continuing UK influence in the Arctic
- Steady developments in technology, communications, infrastructure and cooperation which are making the emergence of the Northern Sea Route (“controlled” by Russia), as a new global trade route between the Atlantic and Pacific, increasingly likely in the C21
• Requirement to address different rates of progress between N. American and & European Arctic, as well as inter-regional anomalies too, and overall effects on Arctic governance.

• Steady evolution in regulatory/mandatory and industry standards: Polar Code; Oil Spill response; and mass evacuation legislation

3. JUSTIFICATION FOR AN UK ARCTIC POLICY

All of the above has facilitated and economically underpinned talk of political change and altering international relations both within the Arctic (Greenland’s move toward independence, Russian relations within the European Arctic, increasing role of commerce in the region), and without, as states such as China, South Korea, India, Singapore, Japan, and the EU all express growing interest—and claims, in the Arctic.

So whilst Circumpolar cooperation is seen by all parties to help reduce tensions and avert misunderstandings, this established status quo may be challenged by the equally powerful fact of encroaching globalisation (especially regarding resources and new trade routes), leading to possible associated instability, and compounded by increasing demands from powerful non-Arctic interests.

The Arctic Economic Council

This has partly resulted in the creation of the AEC by the AC to safely manage this industrializing phenomenon on local inhabitants, along with a review of the role of the key Arctic governance forum, the AC, and whether it should now assert direct control over the sustainable development of the region, or remain simply an advisory body.

This therefore is an opportune time to review HMG’s Arctic Framework as a result of such developments and its continued efficacy under these evolving circumstances. There is arguably a necessity now for a definitive UK Arctic Policy reflecting increasing British strategic, business, and international relations’ interests.

EU Arctic Policy and Commercial Competition in the European Arctic

This need is compounded by fierce and increasing competition from both non-Arctic Asian and (anticipated) EU states, which have all without exception, created substantive national Arctic policies with the full acknowledgment and encouragement of the AC.

Moreover it may be the case that the UK will have to radically change its traditional approach to the Arctic in the light of emerging EU policy, an increasing Asian economic and scientific contribution that dwarfs the UK’s current efforts, and a potential strategic threat posed by Russia in the Arctic. Under these pressing circumstances Britain requires a policy, not only to be a part of the shaping/governance of the region by the AC, and to promote our Framework objectives of SD and EP, but also to consider a more strategic contribution to the AC that is unique, and cannot be offered by Asia or the EU.

Increasingly without such a policy the Arctic Council may consider British views on, and input into policy and economic matters, increasingly irrelevant. The lack of a policy may also indicate to the AC and other competing Observer nations a lack of British economic/societal commitment, and political intent.

4. REVIEW OF THE UTILITY OF THE UK’S FRAMEWORK POLICY

The 2013 Arctic Framework’s emphasis on structure and process has admirably served its purpose of framing the critical opportunities and challenges in the region, facilitating a forum for government departments’ and ministries’ opinions, and articulating the Arctic’s
growing geopolitical importance to the UK in terms of international relations, business, and key societal issues; environmental protection (EP), sustainable development (SD), Indigenous peoples (IP), and climate, to name but four.

Proposal for Consideration

However, following a review of the rapid developments in the Arctic (see Points 2&3) and other recent significant factors, a change in emphasis is recommended whereby there is a shift from process (Framework) – to implementation (Policy).

Reasons for an explicit UK Arctic policy with regard to recent AC announcements and their possible effects on the UK include:

- addition of Asian Observers to the AC and associated questions of governance
- implications of EU Observer membership and UK coordination (or not) with an emerging EU Arctic policy
- changing role of science from an emphasis on underpinning policy development, to substantiating sustainable business
- creation of the AEC and attendant international commercial competition
- AC’s position in the light of western sanctions against Russia in the European Arctic, and implications for the UK’s defence policy
- Explicit demands from the AC for Observer countries to increase their burden sharing responsibilities (including budgets).

Shortcomings of the UK Arctic Framework

The intellectual underpinning of the Framework states that the UK has no right to impose upon the sovereignty – (and create allied concepts such as a formal policy) – of Arctic nations; thus the UK Framework emphasises instead the process by which our interests, contributions, and support of the AC are promoted.

However the UK’s sensitivity about sovereignty per se, is questionable. Every major western nation with interest in the Arctic and many significant Asian Observer states too, are now announcing their Arctic policies (the latest are land-locked Poland and the island of Singapore). The EU too, will produce a policy which will complicate the UK’s position as an EU member state. No AC state considers foreign interest in their Arctic territories as undermining their sovereignty and/or statehood.

Furthermore, precedent has already been set. The UK expressed no reservations vis-a-vis sovereignty in the similar case of the development of the Caspian Sea in the mid-nineties. This was/is a sea surrounded by 5 littoral nations, and included at that time very sensitive sovereignty issues with a recently independent superpower, Russia, a sanctioned Iran, newly created sovereign states Kazakhstan and Turkmenistan, and a recently at war, Azerbaijan (Nagorno-Karabakh, etc). This effort was augmented by the appointment of a former oil executive (reporting to, and paid for, by HMG) as a UK representative to the region, expressly to seek energy business with individual Caspian states for UK Plc, and which proved to be very successful.

5. THE UK FRAMEWORK AND THE AC’s ALTERNATIVE FRAMEWORK

In contrast to the UK Framework, the essential underpinning of the AC’s own Framework – and which is adopted by all Arctic nations and every non-Arctic Observer nation - is sovereign rights (SR), not sovereignty.
SRs are central to the equitable and safe prolongation of indigenous peoples’ livelihoods, commercial activity, good governance, and the implementation, regulation, and monitoring of the AC’s Framework guidelines such as SD and EP. British/Observer states’ commerce for instance, does not require sovereignty over Arctic nations in order to operate, but rather requires (via SR instruments), access to Arctic resources and use of routes, across Arctic states’ territories. SR instruments such as maritime law (UNCLOS) and legislation (e.g. the Polar Code), are typically employed to agree such activities (along with evidence based scientific findings, such as the extent of continental shelves), with Arctic governments.

AAG’s conclusion is that the UK’s reservation about creating an Arctic Policy on the basis of sovereign concerns is both a false flag, and out of step with the AC’s own Framework and Policy (and our competitors’), which will now hinder the UK’s overall ability to operate, contribute, and benefit in the region.

**The Present situation within the UK Framework**

Secondly, the promotion of SD and EP as UK policy aims within the UK Framework is confusing; within the AC Framework these factors are not policy (or otherwise) aims, but simply objectives that act as guidelines and milestones – to enable the delivery of a policy aim, (for instance, “a safe, sustainable, and secure globalisation of the region, for the benefit of the Arctic’s indigenous peoples”).

The AEC is for instance an instrument of that AC policy, which requires all projects (and the AEC itself) to adhere to the AC Framework guidelines (SD/EP, IP, etc.), and be approved by an Arctic nation minister, appointed by the AC. There is clear daylight in other words, between the AC’s process / objectives (Framework), and strategic aims (Policy), which in turn leads to implementation (in this example, by the appointment of the AEC instrument). In this manner, **AC policy determines process (Framework), and not vice versa.**

In response to continuous change in the Arctic, the AC is reviewing its policy aims. Allied to that will be a concomitant change in the AC’s Framework (to facilitate these emerging policy aims). At some stage the UK will therefore have to alter its Framework to mirror these developments in the AC’s Framework.

But for the UK it is policy that is appropriate in response to say, Russian sanctions in the Arctic. As we have no declared policy (and therefore no strategy for implementation of that policy), resorting to alterations in the Framework’s objectives does not address the lack of UK Policy - and these changing circumstances, nor progress our positioning in the Arctic. Policy fulfils that function, along with an accompanying implementation strategy.

**6. POTENTIAL SOLUTION – AN EMERGING UK ARCTIC POLICY**

An UK Arctic Policy with a singular vision and aims (e.g. strategic, societal, scientific and commercial) would publically articulate UK intent, facilitate a mechanism by which the UK can dovetail (and separate out when necessary), its contribution and needs in the Arctic with other AC countries, and by doing so, reduce some of the confusion and hesitation that the UK Arctic Framework constitutionally engenders.

The lack of an UK Policy is something our allies in the Arctic increasingly look upon as bewildering. With the US as chair of the AC in 2015, Admiral Robert Papp, the US special representative to the Arctic, has already suggested that burden sharing in the form of possible payments are on the cards for Observer members, in order to maintain their position in the AC.
It is imperative therefore that the UK has a substantive and detailed Arctic policy in place soon, in order to meet this possible challenge; Papp has stated that he will make the AC “more forward leaning” with a focus on implementing solutions. Without a UK policy it is difficult to see how implementation can occur. But with a policy in place the Framework’s sole role would then be to rightly facilitate the implementation of UK Arctic policy, and provide policy guidelines/objectives (such as EP/SD etc.).

**Recommendation**

A strategic shift in orientation is therefore recommended which moves the focus from the establishment of the Framework, in which EP/SD and societal issues are the essential building blocks, to creating a policy instrument in which these building blocks are no longer seen as an end in themselves, but rather in policy terms, as a means to an end (that “end” being implementation of policy).

**Possible Consequences of a Framework - only UK Position**

Without a clear strategic policy (and attendant vision for the region, along with specific UK aims), the UK’s efforts in the Arctic will be limited - tactical rather than strategic, non-linear in effect, and incoherent to our allies in the region, with whom we want and need to work. As and when the EU becomes a Permanent Observer to the AC, the lack of an UK Policy will further dilute our influence in the formulation of Europe’s Arctic policy, and hobble our ability to align with Europe’s own policy.

Lacking a UK policy it is difficult to see how the UK will compete commercially with other Observer states too that do have Arctic policies - and can thus articulate and negotiate their own wishes with AC nations around common aims, frameworks, and implementation measures.

**Sequencing of an UK Arctic Policy**

Any emerging Arctic policy will first of all have to take into consideration, other UK foreign and defence policy imperatives (e.g. the Antarctic where we have territorial responsibilities, the cost of any augmentation of Arctic activity, and the strategic implications of Russian relations with the west at present).

Once those strategic priorities for the Arctic are established by central government, , then direction can be given to creating an UK Arctic Policy, (e.g. a business and strategic oriented policy, or alternatively an environmental and human rights oriented policy), hopefully overseen by the FCO’s Polar Regions’ desk where our greatest Arctic expertise lies.

It is also recommended that with competing policy emerging from Asia and the EU, any UK policy created is especially unique, strategic in vision, and far reaching in thinking to have any real impact upon AC policy, and be seen by the AC as the significant contribution by an Observer country to burden sharing, as stipulated by the AC, and most recently by the US chair of the AC, Admiral Papp.

7. **PROMOTING PROJECT UK ARCTIC POLICY**

a). Raising UK Awareness

- Commission study on state of Arctic play from Polar experts: with input from academia, business, NGOs and government.
- Structurally incorporate (invite) external expertise onto HMG Polar committees, advisory boards and policy brain-storming sessions in order to inform (but not create) UK policy formulation.
• Offer structured briefings to key departments (MoD, DECC, FCO, DEFRA, DFID, BIS, UKTI etc.) in order to raise awareness and garner support for creation of UK Arctic policy

• Raise issue in Cabinet, looking for Ministerial “sponsorship” - following departmental briefings and feedback

• Conduct series of one-to-one briefings with key PPSs in targeted ministries/departments.
  - Discussion with officials – future SDSR and effect on Arctic policy and UK role regarding MOD tasking. Strategic aspects to be discussed with Norway as priority
  - Discussion with commercial organizations/institutions on an Arctic policy
  - Consider coordinating a geopolitical/strategic oriented Polar Centre of expertise in UK. (non-existent at present). Establish an UK Arctic policy party to assist with EU policy formulation
  - Culmination: debate in houses of Commons/Lords on need for creation and budgeting of an Arctic policy for c21.

b). Short term International Signal of Intent

Appoint Arctic business figure/coordinator for Arctic/Poles – based partly in region

• Individual would be expected to spend at least 50-75% of his/her time abroad

• To be tasked by HMG when/where appropriate

• To coordinate Arctic efforts between UK Plc and UK government offices

• Represent UK Arctic interests abroad and explain revised UK Arctic policy to AC

• Maintain/increase physical presence in region, (conferences, workshops, speeches, publications/interviews, bi-lateral talks)

• Interface with British/Arctic industry (e.g. oil/infrastructure/shipping) in situ, to understand commercial issues and political needs

• Interface at home with academia, Think Tanks, commercial institutions (IMO/Lloyds, OSPAR, etc).

• Make regular and detailed strategic and tactical recommendations to HMG

November 2014
**Arctic Athabaskan Council – Written evidence (ARC0014)**

**Introduction** Thank you for the invitation to deliver testimony to the House of Lords Select Committee on the Arctic. We would be pleased to respond to questions that arise from our testimony, either in writing or in person.

The Arctic Athabaskan Council (AAC) was formed in 2000 and represents internationally Athabaskan peoples resident in 76 villages totaling approximately 45,000 individuals in Alaska and northern Canada. Please see our web site for further details ([www.arcticathabaskancouncil.com](http://www.arcticathabaskancouncil.com)). AAC is a Permanent Participant to the eight-nation Arctic Council.

**The Permanent Participants** While there is considerable solidarity between Indigenous peoples in the circumpolar world and we often work together, we sometimes have different perspectives on issues which reflect our unique cultures, historical experiences, and geographies. Athabaskan peoples are particularly concerned with terrestrial species of wildlife such as barren-ground caribou, rather than marine species, such as whales and seals. All of us, however, are committed to protecting the natural environment upon which we all so closely depend, and ensuring that development in our part of the world accords with principle of sustainability as articulated in the 1987 Report of the World Commission on Sustainable Development. We bring these values to the Arctic Council, the region’s premier body to promote international co-operation in the region.

**The UK Arctic Policy** We are impressed with the UK Policy toward the Arctic which correctly in our view characterizes climate change as a key driver of economic, social, cultural and environmental change in the region. Moreover, we greatly value the UK commitment to research in the Arctic and its track record as a constructive observer in the Arctic Council. While the UK intervenes infrequently in the Council, its interventions are always to the point and professionally carried out.

**Climate Change** Four years in the making, the Arctic Climate Impact Assessment published for the Arctic Council by Cambridge University Press in 2005 is the Arctic Council’s premier report. It projects very significant energy and mineral development and trans-Arctic shipping in the region in coming decades as the Arctic “opens” as a result of sea ice ablation caused by climate change. UK scientists contributed significantly to this assessment, as did scientists from Germany, France the Netherlands and elsewhere in Europe.

In the early stage of this assessment, Permanent Participants approached the Polar section of the UK Foreign and Commonwealth Office (FCO) for assistance in getting Dr. Mark Nuttall, then at the University of Aberdeen, involved in the assessment on behalf of Arctic Indigenous peoples. This is indeed what happened, and provides a compelling example of how the UK can be helpful in Arctic matters. We meet in the Arctic Council—a “high level forum”. In this vein, it is worth recalling that in 2002 the UK and the Netherlands jointly organized a highly successful two-day Arctic Council related meeting at Wilton Park to discuss Arctic policy and the evolution of the Arctic Council. Here is an example of “you” convening “us”

**The Arctic: the World’s Barometer** In the ACIA projections lies an important lesson. Key drivers of change in the Arctic are the result not of actions in the region, but actions and decisions outside it. Emissions in tropical and temperate lands of heavy metals, including mercury, persistent organic pollutants such as insecticides, by-products of industrial burning processes, black carbon from inefficient diesel engines and, of course, greenhouse gases, eventually have a direct and accelerating impact in the circumpolar world.
In 2003 the Governing Council of the United Nations Environment Programme (UNEP) adopted a resolution that effectively characterizes the Arctic as the world’s barometer of environmental change, and urged states worldwide to look north and to heed the barometer’s reading. Of course, we see ourselves as the mercury in the barometer. This metaphor is accurate as well as compelling, and might usefully inform your report and recommendations to the Government of the UK.

A key challenge facing northerners and all who profess to have interests in the region, such as the UK, is to bring Arctic perspectives to bear on international and global decision-making. This won’t be easy but we have done it successfully in the past. The 2001 Stockholm global Convention on POPs singles out the Arctic and Indigenous communities and characterizes the issue as one of human health and culture as well as environment. European observer states to the Arctic Council were helpful and constructive in supporting language to this effect, eventually included in the Convention’s third preambular clause. In 2005 the eight Arctic states and five European observer states to the Arctic Council issued a joint statement at the Conference of the Parties to the UN Framework Convention on Climate Change that occurred in Montreal. With the support of the Permanent Participants, the statement addressed the ravages of climate change in the Arctic and the importance globally of what was taking place in our region. 

Michael Meacher, when UK Minister of State for the Environment, visited the Canadian Arctic in 2002 with his Canadian counterpart, David Anderson. Mr. Meacher returned to the UK where he spoke and wrote eloquently to the English speaking global audience about the international importance of the Arctic. His efforts were widely appreciated.

The Arctic Council
It is our view that taking Arctic perspectives on transboundary issues to the world is the key challenge facing the Arctic Council as the United States assumes the chair in April 2015. This is why AAC fully supports the application by the European Union to become a full observer to the Arctic Council. As you are well aware, Canada has not supported this application. As a result, an entirely enigmatic clause was inserted in last year’s Kiruna Declaration signed by the Arctic states that allows the EU to attend meetings but, quixotically, denies formal observer status. It is our hope and expectation that the UK, the world’s most northerly non-Arctic state, will press the EU to reflect Arctic circumstances in international negotiations that address emissions that harm the Arctic.

The Arctic Council: the 20th Anniversary
The Arctic Council celebrates its 20th anniversary in 2016. The Arctic Policy of the United States opens the possibility of a Heads of Government meeting of the Council to mark this occasion. This provides an opportunity to seriously look at what the Council has accomplished and what it should seek to accomplish in coming years and, more broadly, how Arctic perspectives can and should inform global decision-making. Such an occasion can take us out of the constraining politics of two-year rotating chairmanships established through the 1996 Ottawa Declaration that set up the Arctic Council. It would be most helpful if the UK and other observer states were to support such an initiative and signal their willingness to participate in it.

September 2014
TUESDAY 15 JULY 2014

Members present
Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Moynihan
Lord Soley
Baroness Symons of Vernham Dean
Lord Tugendhat

Examination of Witnesses

Professor Chris Rapley, University College London, Dr Ed Hawkins, University of Reading, and Dr Sheldon Bacon, National Oceanography Centre

Q16 The Chairman: Good morning, and welcome to the second evidence session of the Arctic Select Committee. Today we are dealing with climate change in the first session, and in the second session with sea ice. Perhaps I may ask you briefly to introduce yourselves. I think you have a good idea of the type of questions that we will be asking you. I should say that we are not expecting everyone to answer all the questions, but please speak if you have something to contribute. I should remind everyone that the session is being broadcast.

Professor Chris Rapley: I am Professor Chris Rapley. I am the professor of climate science at University College London. Previously I was the director of the Science Museum and prior to
Dr. Sheldon Bacon, Dr. Ed Hawkins and Professor Chris Rapley – Oral evidence (QQ 16 – 28)

that the director of the British Antarctic Survey, which obviously has a role for UK science in the Arctic. I am also currently the chair of the London Climate Change Partnership, which seeks to climate-proof London.

**Dr Ed Hawkins:** I am Dr Ed Hawkins. I am the principal research fellow in the National Centre for Atmospheric Science at the University of Reading. My research interests lie in climate variability and predictability.

**Dr Sheldon Bacon:** I am Dr Sheldon Bacon. I am the associate head of the Marine Physics and Ocean Climate Group at the National Oceanography Centre in Southampton. My main interest is in the high latitude oceans.

**Q17 Viscount Hanworth:** When we compare the temperature series from the northern hemisphere with the southern hemisphere, we can see that whereas there has been a monotonic increase over the past century in the temperature of the southern hemisphere, there has been a hiatus in the increase of the northern hemisphere temperature, with even a decline towards the middle of the 20th century. However, it seems that the current rates of increase are very high. Can we explain the reasons for this hiatus, which I think is even more pronounced in the Arctic temperature series? Also, can we identify the factors that have led to the underprediction of the northern hemisphere temperature increases, and certainly the Arctic ones, by the models? Finally, can we trust the models to make reasonable predictions of the future, or do they need to be substantially revised?

**Professor Chris Rapley:** The first observation I would make is that the increase in greenhouse gases in the atmosphere has caused an energy imbalance so that at present the planet is collecting more energy than it is radiating into space. More than 90% of that energy goes into the ocean because it is dark and covers such a substantial part of the planet. The evidence that we have indicates that the energy imbalance is alive and well, if you like, and
that a substantial amount of energy is going into the deep ocean. The fact that we see temperature fluctuations in particular regions or in a hemisphere means, particularly in the atmosphere, that we are talking about a few per cent of that energy imbalance. We can expect to see fluctuations and variations. I am not a climate modeller, but models are not simulations; they are the best that science can do to illustrate what we know and use what we know about the physics, chemistry, dynamics and so on of this complex system. It seems to me that models do a reasonable job of simulating what we have seen so far, but where they differ is where we learn about new science. The fact that there are discrepancies between what the models may have predicted and what is observed shows us that we can learn more about how the planet works. Any predictions of the future have to be taken with caution because there will always be irreducible uncertainties. It is the job of any decision-maker in any walk of life to recognise those irreducible uncertainties and take them into account in their decision-making.

**Viscount Hanworth:** Perhaps I may make a supplementary comment. We do see a systematic difference between the northern hemisphere and the southern hemisphere. Have the models been able to explain that, because if it could be explained that would surely be a validation of the models to pitch against the declared deficiencies in forecasting temperatures, as has been shown over the past 30 years?

**Professor Chris Rapley:** I think it would be safer if a modeller commented on what that means for the models. It does not surprise me that the Antarctic, being a huge mass of very cold ice, is responding differently from the Arctic, which is an ocean surrounded by land.

**Viscount Hanworth:** It has much more inertia.

**Professor Chris Rapley:** Yes. There is a huge inertia in the Arctic and there are processes which I think are becoming understood that describe or account for why the Antarctic sea
ice has extended its areal coverage by a few per cent, whereas of course the Arctic ice, particularly in the summer, has melted back very dramatically. I believe that it is of the order of minus 7% per year. So there are big differences between the two hemispheres, but how the models interpret those differences should be answered by a modeller.

**Viscount Hanworth:** That is judicious scientific caution. Thank you.

**Dr Ed Hawkins:** Global temperatures have increased by around 0.8 degrees over the past 150 years, but that increase has not been uniform, which you alluded to. Particularly in the Arctic we have seen a warming period from about 1900 to 1940, followed by a period of cooling and then by a period of warming since around 1970. That is particularly pronounced in the Arctic. The features of the warming are pretty well understood. The recent warming has been ascribed mainly to greenhouse gas increases, while the cooling from 1940 to 1970 is generally attributed to volcanic eruptions and an increase in particulate emissions from coal-fired power stations—the so-called aerosols. The warming from 1900 to 1940 was probably due to a mixture of causes: in part to an increase in solar activity, in part to an increase in greenhouse gases, and in part due to random variability in the climate system, as well as to a recovery from previous volcanic eruptions in the late 19th century. There are many things that affect how global temperatures and Arctic temperatures behave, and we have had to piece them together to understand the whole, which is a slowly varying temperature that is generally increasing but has variability on top of the long-term increase.

As for the models, they reproduce the spatial pattern of that warming particularly well. We can see higher rates of warming in the Arctic, at about two times the global average, and models have reproduced that. The observations show that the land is warming up more than the ocean, and again the models reproduce that. We see more warming in the northern hemisphere and so on. The models reproduce the spatial pattern of warming very well, so
when you include all the different factors that change global and Arctic temperatures, they can reproduce them relatively well. However, on top of those is a natural variability—random fluctuations in how the climate behaves on top of any changes that are due to human activities and other forcing agents.

Q18 Lord Soley: My question in a sense follows on from that. I am interested in the question of uncertainty in the predictions about the Arctic. What techniques do you use to monitor the changes in the Arctic, and how reliable are they in predicting future trends?

Dr Ed Hawkins: Is this a question about current monitoring?

Lord Soley: Yes, it is.

Dr Ed Hawkins: We have pretty good records of land temperature in the Arctic and from long-term meteorological stations situated on the northern land areas. We have less information about temperatures over the ocean in the Arctic, which are particularly difficult to observe for obvious reasons. We are fairly confident about the temporal change in the warming, although there are uncertainties because we have not observed everything at all times. Unfortunately, we do not have a time machine and so we cannot go back and make observations for where we do not have any. We are reconstructing from the information that we do have, and that has improved over time. We are taking more observations now than we were and our ability to monitor what is going on has improved, but it could be improved further.

Lord Soley: So you are saying that you can monitor land temperatures fairly well but it is more difficult to monitor at sea.

Dr Ed Hawkins: We do have some monitoring.
Lord Soley: Of course, I understand that. I want to ask a follow-up to that. Given the differences and the difficulties in getting the models right for the whole thing, how confident are you about future predictions?

Dr Ed Hawkins: The future predictions are based on sound physical principles. We understand the basic physics of the greenhouse effect, so if we add more greenhouse gases to the atmosphere, temperatures will rise. We have understood that since the 1860s.

Lord Soley: But the Arctic is different from the rest of the planet.

Dr Ed Hawkins: Yes, so the Arctic is projected and has been observed to warm at around twice the average global rate. That is roughly speaking. We do not know whether the rate is 1.9 times as fast or 2.3 times, but it is warming at roughly double the rate. Again, that is based on sound physical principles, because there is a feedback. As you warm the planet you melt the ice, as we have been seeing. That reduces the reflectivity of the planet so that more energy is absorbed into the oceans rather than reflected out into space, which amplifies the warming that we are seeing. Again, this is based on physical principles and without necessarily any reference to models.

Lord Soley: You are therefore assuming that the variability, and therefore the difference in the Arctic as opposed to other areas, will continue. Will you be able to measure that?

Dr Ed Hawkins: We expect to see amplified warming in the Arctic in the future, and on top of that we will see random fluctuations that are to a degree essentially unpredictable. They will mask or enhance temperature trends at different times in the future. However, we will see an overall warming with an Arctic amplification.

Professor Chris Rapley: It is probably worth making the point that you can imagine the human signal, the secular increase of temperature, emerging out of fluctuations. Scientifically that is called the signal-to-noise ratio. When the signal emerges from the noise,
Dr. Sheldon Bacon, Dr. Ed Hawkins and Professor Chris Rapley – Oral evidence (QQ 16 – 28)

you have made a detection. It is not at all clear that the signal-to-noise ratio in the Arctic is better than down in the tropics, because although the fluctuations in the weather in the tropics are much smaller, the secular signal from human drivers of change might be more easily detectable there. The point is that the amplifying process that we have just heard about, the so-called ice-albedo or snow-albedo feedback, amplifies the variability just as much as it amplifies the signal. It is a very complex area.

In terms of monitoring, I would add that for 40 years now we have had satellite observations of physical features such as sea ice coverage, which have been enormously helpful in revealing what is going on in the Arctic. Not all the satellites go right up to the North Pole, although more recently some satellites have been launched that have what is called a higher-inclination orbit, so they can get closer to it. However, the coverage has been sufficient to show that there have been very dramatic changes. Interestingly, the fact that the models may not be perfect should not be a source of complacency, because those models have underestimated the rate at which the sea ice has been observed to decline, so the models can err either way.

You have heard that we do not have a time machine, but actually we do have one in the sense that we have evidence of how the Arctic has behaved in the past. That evidence has come from ice cores, lake sediments and tree rings. Although, as you well know, there is huge controversy around the so-called hockey stick and whether tree ring data are reliable about the past, at least one recent paper seems to be fairly convincing. It suggests that what we are observing despite the natural variability in the Arctic is rather unusual now compared with what has happened over the past 1,000 years or so.

Lord Soley: Do you mean by that that the speed of change has become even greater?

Professor Chris Rapley: I mean the speed and the size of the change.
Q19 Baroness Symons of Vernham Dean: I want to pick up on the time machine point touched on by Dr Hawkins and the random nature of these temperature fluctuations. I was very interested in what he said about the 20th century in that there was Arctic warming at the beginning of the 20th century because of solar activity and the effect of greenhouse gases. Then we had a cooling period and now we are in a warming period. We do not have a time machine, so how do we know that these periods of 30 or 40 years do not happen as a matter of natural course in every century? Why was this not happening in the 1800s and the 1700s? Perhaps you have a bit of a time machine, but I was very struck by the random nature of how this is going. Has it always happened in every century?

Dr Ed Hawkins: Undoubtedly yes. We do not have long records going back to those times. As an aside, we have additional observations that we have not included in our estimates, because they are handwritten and we have not digitised them all. A very good task would be to rescue some of the older data that we have not yet used in order to reconstruct some of the variability further back in time. Particularly during the period from 1900 to around 1940, there are several factors to take into account: solar activity, recovery from volcanoes, and a small greenhouse gases increase, along with a suggested contribution by soot emissions. Soot lands on the snow, making it darker and less reflective. That was happening particularly during that period. Also, we think that there was a positive warming from variability, which we would expect to see in the future as well as back in the past.

Several factors will come into play to cause the time structure of the warming that we are seeing. There are several factors, and variability has happened in the past and will continue in the future. It is entirely plausible that we will see a decade or more of cooling during certain periods in the future on top of a long-term warming trend. Although temperatures...
will generally go up, that will not happen smoothly; rather, it will happen in fits and starts as variability enhances or counteracts the trend.

Viscount Hanworth: I have one more question on the model described by Dr Hawkins. In modelling the temperature series, do you regard the random fluctuations as statistically independent of the underlying trend, or would you imagine that a positive deviation from the trend would actually feed back into the trend in order to amplify it further?

Dr Ed Hawkins: I think it is fair to say that they are not independent.

Lord Hunt of Chesterton: It is about the distance.

Viscount Hanworth: I am sure that they are not independent, so I wonder whether the modelling takes that into account.

Dr Ed Hawkins: They are not independent, which is a bit of a challenge because the particular realisation of variability that we have seen in the real world is not seen exactly in the modelling. We do not see the fluctuations occurring at random times.

Viscount Hanworth: The positive deviation ought to be taken into account in modelling the trend, and you are saying that it is taken into account.

Dr Ed Hawkins: The models reproduce similar features. We do not expect them to reproduce the exact timing, but they have reproduced similar features in the simulations.

The Chairman: Can I follow up on the first question and ask you once more what the projections are for the future? What can we expect to see happen over the next one or two decades? What is the best estimate?

Dr Ed Hawkins: Do you mean for temperature in particular?

The Chairman: The temperature and other major effects. Perhaps you can respond briefly.

Dr Ed Hawkins: We expect to see continued temperature rises in the Arctic at around twice the global average rate. There is also the contribution of variability, which could go against
that long-term trend in the near term. We might see a period of cooling; that is entirely plausible. However, we might see variability enhancing warming as well. The next 10 to 20 years are particularly difficult because of the interaction between the long-term trends and the variability on top of those trends.

**Q20 Lord Hunt of Chesterton:** First, I must declare my interests. I am the president of ACOPS, an NGO. I am a former professor at University College London and I am a director of a small consulting company. Dr Bacon has not spoken so far. Perhaps I may ask him about the data on the Arctic and how the Arctic may be connected to what is happening in the north Atlantic. As you know, there were some discussions earlier on that the so-called thermohaline circulation would dominate changes in a very dramatic way, but equally the Met Office itself, which always believes in the Gulf Stream being driven by the westerly winds, means that there are two big effects. Do we have enough data on these things? Is the modelling adequate, and is the public explanation of these relatively big effects becoming better understood?

**Dr Sheldon Bacon:** It is probably worth commenting, in the context of an inquiry such as this about the Arctic, that the Arctic is a great deal closer than we generally recognise. If you start in the Shetland Islands and go five miles west, you only have to go down 500 metres into the ocean to find a freezing cold body of Arctic water, so the Arctic is part of our territorial waters; it is just not at the surface. Those waters happen to comprise roughly half of the headwaters of the feature that Julian referred to: the thermohaline circulation, which is also called the meridional overturning circulation. It is mostly commonly perceived by the press and the public as the surface expression, which is the Gulf Stream. It draws warm Atlantic waters northwards past our latitudes and has been called a fan-assisted storage heater because the westerly winds extract heat from the ocean. The ocean cools, the
atmosphere warms, and thus delivers us our benign climate. Regions at the same latitudes experience much colder and harsher continental climates that do not have that oceanic heat supply to ameliorate the conditions.

Can the Arctic play a role in modulating the circulation feature, which takes warm water northwards at the surface and cold dense water back down south? Yes, it can. There is a well hypothesised mechanism whereby the Arctic is the source of huge volumes of fresh water. Some 10% of the entire world’s river flows enter the Arctic Ocean, although the Arctic Ocean itself comprises only 3% of the world’s ocean surface area. That huge volume of fresh water, if released in a burp, can interrupt the overturning circulation. There are stories about it stopping. I think that is highly unlikely, but it certainly stands to slow it down, and various model projections into the future do indicate that that might happen—possibly to the order of 20%. It might have that level of impact on our climate by delivering less heat.

**Lord Hunt of Chesterton:** My question turned more on the data and the analysis. Are we measuring the ocean and the surface waters of the ocean in sufficient detail to detect this? Let us suppose that there was going to be a significant oscillation. Oscillations do not happen in a day. As we know from El Niño, they develop over time. By studying the oscillations of the Pacific, people can now forecast what is going to happen to their crops in terms of floods and so on. Could we and should we be doing something like that in the Arctic?

**Dr Sheldon Bacon:** The state of knowledge is problematic but improving. If we go back into the past, we find that there is a scarcity of data through difficulty of access. The Arctic is covered in ice and the climate is harsh. Analyses that attempt to identify changes in temperature and in the freshwater content of the Arctic Ocean, and thus the dilution of salinity, must perforce aggregate over long periods of time. It is therefore very difficult to identify changes on timescales shorter than a decade. Typical analyses involve comparing
the 1990s with the 2000s, for example. That has started to change through the development of new technologies. Ice-tethered profilers are gadgets that sit on an ice floe and have a kilometre of wire underneath to provide ocean data in the upper waters, where it is needed. Remote-sensed measurements, which my colleagues in the next session may tell the Committee about in the context of sea ice, are also effectively able to detect sea surface variability through the ice. They can tell you about circulation changes, which in turn can tell you about the storage and release of volumes of fresh water.

The question therefore has two answers. This is rather hard to do for the past other than on rather coarse timescales, but our ability is improving. Boundary measurements in the ocean are quite good sources of data.

The Chairman: Let me say that this session is not just about sea-based elements but about the land-based areas of the Arctic as regards climate change.

Dr Sheldon Bacon: I think the land is not too bad.

Lord Hunt of Chesterton: Do we have data on Russia?

Dr Sheldon Bacon: I am sure that the Russians have data on Russia, but it is rather hard to extract them. It is possible, but that usually involves some scheme involving lobbing balls over walls, as it were. You can give a friend in Russia a programme and he will send you back a derived product.

Lord Hunt of Chesterton: It seems to me that one of the things that this Committee might discuss is whether more could be done on collaborating with Russian colleagues.

Dr Sheldon Bacon: Yes.

Lord Hunt of Chesterton: You said that it is important, so if it is important, people can make the effort.
Dr. Sheldon Bacon, Dr. Ed Hawkins and Professor Chris Rapley – Oral evidence (QQ 16 – 28)

**Dr Sheldon Bacon:** It is indeed important. Thus far, when I have required certain amounts of Russian data, I have used the method that I described, which relies very much on personal contacts. You have to know someone who can access, in a perfectly proper way, foreign archives and deliver, again in a proper way, a derived product.

**Q21 The Chairman:** If we had a wish list of what data we would like to collect but are not collecting for the region generally, what would they be?

**Professor Chris Rapley:** For me, it would be a greater density and range of ocean measurements because, as I said earlier, that is where the energy tends to go. In the end that is what will be a driving force in the climate change that follows. In particular, for example, the absorption, or not, by the Arctic Ocean of carbon dioxide is virtually unmeasured. Is that fair to say?

**Dr Sheldon Bacon:** It is, yes. Carbon dioxide is important, but while physical oceanographic measurements are growing and we can start to look at circulations and transports of heat and fresh water, it is very difficult to say much about biogeochemical properties or likely changes in the ecosystem.

**The Chairman:** Do you have a wish list, Dr Hawkins?

**Dr Ed Hawkins:** As Chris has said, ocean observations in the centre of the Arctic would be very useful not only for monitoring but to help to validate and test our models and our ability to simulate the climate in the region. That would be particularly useful.

**Dr Sheldon Bacon:** Key to this would be atmospheric observations over the ocean. That is one thing that is almost totally absent.

**Dr Ed Hawkins:** One other point I mentioned is data rescue, where we recover data from handwritten records dating all the way back to 1800 or so that have not been digitised until now. They can tell us a lot about variability, which we think is going to be very important.
**Professor Chris Rapley:** Perhaps I could add a word on the Russian data that were mentioned by Lord Hunt. It is certainly clear that the Russian meteorological network was much reduced following the fall of the Soviet Union, simply because there was not the finance or the infrastructure to keep it going. We should mention that the World Meteorological Organization and the World Climate Research Programme have recognised this and have attempted to assist Russian scientists to carry on making useful observations. I cannot remember the name of the particular site, but one investment was celebrated: it was an Arctic Rim station where the finance was projected into Russia in order to provide support. This problem has been recognised and people are trying to work through it.

**Q22 Lord Addington:** We have heard through other work in the Committee that Canada is the other big player in the area. I was wondering whether you need support. What have we done to encourage the Canadians, as members of the Commonwealth, NATO and all the world organisations to actually undertake an interface with Russia? Are we supporting them or helping them to do this?

**Professor Chris Rapley:** You may recall the famous International Geophysical Year 1957-58, which was the third major international effort that included a massive programme to look at the polar regions. Then in 2007-08 we had the International Polar Year, which had 60 nations represented by 15,000 scientists. Interestingly, I was the chair of the planning group for it. The International Council for Science and the World Meteorological Organization sponsored it. The Canadians played a tremendously strong role in the International Polar Year, and in doing so established very close collaborations with the other Arctic Rim science nations, including the Russians to the best of their ability. The Canadians essentially saw that climate change in the Arctic was of huge national interest to them and they have therefore felt very motivated to be central players, and indeed have continued to be so.
Dr. Sheldon Bacon, Dr. Ed Hawkins and Professor Chris Rapley – Oral evidence (QQ 16 – 28)

Q23 Lord Hannay of Chiswick: Perhaps Dr Bacon can start this response. Can you say a bit about the changes that we are seeing within the Arctic Ocean and within neighbouring waterways as a result of rising temperatures and declining sea ice? Is it possible to predict what any future impacts might be?

Dr Sheldon Bacon: That is rather tricky to answer because of the paucity of observations. The things that we observe are the rising temperatures and the declining sea ice. Beyond that, my personal view is that possibly the most important clear change that we have seen—at least let me take a step back—is that if you take the ice away from the top of the ocean, the ocean is exposed to direct forcing by the winds, which means that the ocean will move in response to the winds blowing. This is called spin-up. You are removing a lid, so the winds can in effect transmit momentum directly to the ocean circulation. At the present time, the Arctic is a very sluggish ocean. It has average circulation speeds of perhaps a couple of centimetres a second. That is slower by an order of magnitude or more than typical open ocean circulation speeds. If the ice is removed and the ocean can then spin-up, the Arctic Ocean might become more like an ordinary mid-latitude ocean like the Atlantic.

If that happens, one remarkable and potentially worrying possibility is that the ocean turbulence could increase. At the moment the Arctic is very quiescent. Turbulence generates mixing in the ocean. If you were to take a slice down the middle of the Arctic, it would look like a Victoria sandwich. There is cold water at the top, cold water at the bottom, and in the middle is the jam of warm water that originated in the Atlantic. It cannot reach the surface because it is at least 200 metres down. If you allow for an increase of an order of magnitude or greater in turbulent mixing, that heat could be mixed up to the surface through the insulating overlying layer of cold water. That is a potential direct consequence of sea ice decline. We have observed the first evidence of spin-up through colleagues at the Centre for
Polar Observation and Modelling at UCL. The recent retreat of Arctic sea ice permitted the atmosphere to grab the ocean north of Alaska and Canada and caused a spin-up of a feature called the Beaufort Gyre. This is detectable from space because basically it causes a bulge in the ocean surface. What is the possibility of that happening? Spin-up can also store fresh water by effectively coralling the water into a particular place. If you allow the bulge to collapse back to a level surface, that can export or flush out a large volume of fresh water that originated from the rivers. That can impact on the overturning circulation outside the Arctic.

Perhaps of more concern for the interior Arctic is that if you enable a mechanism to mix heat up from below towards the surface, the confidently predicted seasonal decline of sea ice could very rapidly transition into a continuous absence through accessing the large subsurface reservoir of heat.

Those are the sorts of potential impacts that are in the front of my mind.

**Lord Hannay of Chiswick:** Would that mean that we would see a rate of melt of Arctic sea ice at twice the rate of sea ice melt at, say, the Antarctic in those circumstances?

**Dr Sheldon Bacon:** Yes.

**Q24 Lord Hannay of Chiswick:** Could we go on to a slightly different aspect? Is there any clear scientific correlation between the effects of warming in the Arctic on both land ice and sea ice and the rise in sea levels outside the Arctic? Is there a clear correlation so that we know that if the land ice and the sea ice melt, as the model predicts in the Arctic, there will be a rise of X elsewhere?

**Dr Sheldon Bacon:** Sea ice melt obviously will not do anything to sea level rise, but the major ice cap is Greenland, and its melt rate has accelerated. Perhaps I may refer the question to a colleague, Professor Andy Shepherd, who knows about terrestrial glaciology, is witnessing
the session and will come before the Committee in the second evidence session. But, yes, Greenland ice will melt and sea levels will rise accordingly.

Lord Hannay of Chiswick: My question is whether there a clear correlation: that is, can you scientifically state that if the Greenland ice cap melts in a particular volume over a particular period, that will produce a particular amount of sea level rise?

Dr Sheldon Bacon: Oh yes, absolutely.

Lord Hannay of Chiswick: Is that public knowledge?

Dr Sheldon Bacon: Yes, it is. If you add mass to the ocean it will rise by a certain amount. That has presently been identified with some confidence as being part of the last century’s contribution to sea level rise. The other part is thermal expansion.

Lord Hannay of Chiswick: And the evidence we have from the facts in recent years shows that that correlation is robust.

Dr Sheldon Bacon: Yes.

Lord Moynihan: Perhaps I may preface my supplementary question with a declaration of interests by declaring my shareholdings in Rowan Companies plc and in Canadian Natural Resources Ltd. I am also a director of a number of renewables and clean tech companies in the UK and the USA, none of which is active in the Arctic.

Dr Bacon, I was really interested in your comments about the impact of turbulence. Given Lord Hannay’s question about future impacts, can you make comment on the impact that turbulence could have on a shift in marine distribution, particularly in the context of fishing grounds, plankton and the general depletion of fishing stocks, as well as the timescale of these effects? Some observations on these would be very helpful.

The Chairman: Would you please also address the issue of ocean acidification and whether that would be relevant?
Dr Sheldon Bacon: That, too, is immensely difficult, because we lack carbon measurements in the ocean, so it is very hard to make any clear statements about which way the Arctic is going. It is likely to be acidifying, but we do not know.

On the subject of ecosystem variability, it is almost certain to change. However, you can find arguments on both sides for which way it will go. It is a very difficult topic. If you consider specifically turbulent mixing, at present in the Arctic there is a feature called subsurface chlorophyll maximum. Chlorophyll needs to exist within a range of light so that it can grow, but it also needs to swim in a bath of nutrients so that it can feed. At present, those two conditions are met at around a depth of 50 metres. If the turbulent environment were to strengthen, you could mix the nutrients up from below more powerfully and the chlorophyll could exist closer to the surface, where they would rather be. That has large ramifications for the biological carbon pump—the amount of carbon that is extracted from the atmosphere and deposited into the sea bed—and for the ecosystems that thrive on a likely greater bloom of plants in the ocean and the chlorophyll that would come to exist as a result of the greater uploading of nutrients.

Lord Moynihan: Have there been any studies that you can recommend or direct us towards on this specific issue? I acknowledge your opening comments about the proximity of the Arctic to the Shetland Islands, and therefore quite clearly we would be concerned, for example, about the impact on the Scottish fishing industry over time. If you could direct our attention towards some studies, possibly on both sides of the argument, that would be very helpful.

Dr Sheldon Bacon: Perhaps I may reply to the Committee in writing on this.

Lord Hunt of Chesterton: Researching something is always a good thing.
Q25 Baroness Browning: Can we turn to the land-based impacts of changing temperatures and how the permafrost thaw might impact on both species and the indigenous populations? Are we already seeing modification of species, and has that had an impact on working practices and so on among the indigenous populations?

Professor Chris Rapley: Everyone is looking in my direction. I am not sure about ecosystems and so on because I am not an ecologist, so perhaps I shall pass on that. I would say that there is plenty of evidence, particularly from the major operators like the oil companies that are working in these high latitudes, of a reduced period during the year when they can use ice roads. There are problems with permafrost heave that is damaging infrastructure. It is not scientific, but I was very taken two years ago while at a big conference in Montreal, the third conference of the International Polar Year looking at the results entitled Results to Action. The conference organisers went to great lengths to get representatives of the Circum-Antarctic peoples to take part in the conference. What I thought was fascinating—it can be discounted judiciously—was the consistent message from the elders of the Inuit and others who are long-standing survivors up there. They said, “We are survivors. We survive in a very harsh climate and we have done so for generations. Our traditional knowledge is based on a series of heuristics that tell us how to cope with various extreme weather events. When we see these changes, our traditional knowledge tells us that what we are experiencing now is outside the realms of our past experience”. The sealers are finding it very difficult, although interestingly they are now using modern technology to plan their sealing expeditions. The reindeer herders are also having difficulties. One interesting anecdote was that they had not previously experienced freezing rain early in the winter season. The rain lays down an impervious layer in the snow and the reindeer find it much more difficult to smell and find their fodder, thus making it much more difficult for them to
survive the winter. A number of pieces of anecdotal evidence of that sort show that these peoples are in trouble and are facing conditions that they have not encountered previously.

**Baroness Browning:** Who would actually take the lead on looking at possible changes in species modification and the impact on the indigenous populations?

**Professor Chris Rapley:** The Royal Swedish Academy of Sciences runs a research station at Abisko. Professor Terry Callaghan, a British expatriate, has been the director for years. I would recommend him as a good expert to talk to about these issues. I do not know the specific Canadian, American or Russian ones, but we could find them for you and write to the Committee.

**Lord Tugendhat:** Can I take up the anecdotal point that you made? You say that the Inuit are talking about things that are new to them in that they have not occurred in their life experience, and that you have scientific evidence and research that goes back for a period. However, if we were to delve deeper into history back to the period when the Vikings first settled in Greenland and the settlements then disappeared because of changes in the weather, do you think that what is happening now is very different in kind from what might have happened in the past? Alternatively, do you think that what happened in the past when settlements were formed and disappeared might have been more extreme or variable than the conditions at present?

**Professor Chris Rapley:** The paleoscience studies that look at the ice core, tree ring and lake sediment data do see those signals from the medieval warm period and the little ice age. There is a very interesting paper on this and I can give the Committee the reference. It attempts to look at the impact on sea ice covering the Arctic and air temperatures, and finds that sometimes when things have been warmer in the air the sea ice has reduced while at other times it has not. There are some quite complicated processes at play, and indeed the
warm water injection from the north Atlantic seems to be a much stronger indicator of ice retreat than air temperature necessarily might be. That at least is according to the paper, although it is always dangerous to base any conclusions on one study, but this one does seem to be fairly robust.

It is often suggested that the fact that there have been warm periods in the past indicates that what we are seeing at present is not something that we should particularly worry about, but what that actually shows is that the climate system is what I would call a frisky beast that is affected by quite small driving forces and cumulative forces. The fact that humans have changed the energy balance, which we know is true, leaves open the question that if one asserts that what we are seeing at present is just a natural fluctuation, how is it that the physics of the greenhouse effect have been neutralised? We need to see a mechanism to explain that, but as far as I am aware there is presently no such mechanism.

I can say one other thing on fluctuations in the Arctic. If we go back to the last ice age, again the ice core data from Greenland in particular and backed up by lake sediment data across Europe show that the climate was capable of flickering. It would suddenly change by five degrees or so beyond the resolution of the ice core, and possibly it happened in less than 10 years. It would jump up to a new state, sit there for 20, 50 or 100 years, and then jump back down again. The mechanisms that drove those flickers seem to be specific to the cold phase of the climate when it is in an ice age. The hypothesis is that it probably has something to do with fresh water injections into the meridional overturning circulation, so it is not clear that those mechanisms apply now that we are in a warm state; it simply illustrates that this is a very complex system that can change, through small driving forces, very dramatically.

**Viscount Hanworth:** I have a brief question regarding the balance between respiration and photosynthesis in the Arctic. I have just read that at present there is a consensus that the
Arctic is now in fact a sink rather than a source, which is quite a different appraisal from what seemed to be in people’s minds 20 years ago when there were horror stories about the effect of emissions of methane from the melting tundra. What is the current prognosis, and will that horror story play out at some point in the future?

**Dr Sheldon Bacon:** The Arctic Ocean is a sink for carbon at present. How that will change in the future is not clear.

**Lord Hunt of Chesterton:** As far as I understand it, the party line—

**The Chairman:** Perhaps we could hear from the witnesses just for the moment.

**Professor Chris Rapley:** Briefly, the alarming prospect of methane clathrates being released from the shallow oceans or methane being released from the permafrost is a scientific issue that needs to be studied very closely. For my own part, I look back at what the paleo-evidence is about the state of the planet in previous warm periods, the Illinoian and so on. What we do not see is a dramatic thermal runaway of the planet. The planet was a few degrees warmer and sea levels would have been higher, but we do not see massive and long-lasting methane injections. We were discussing this before we came in, and we suspect that methane is a relatively short-lived greenhouse gas, although a very powerful one, and so a sudden release of a certain amount of methane will have a transient effect, but it seems that it is then oxidised away and that is an end to it. I think that is where the story is now. It is not quite as frightening as it seemed to be a few years ago.

**The Chairman:** Thank you, that is very useful. I would like to get one thing clear on permafrost. On reading the background material, the boundary of the polar permafrost seems to have retreated, I believe, by around 100 kilometres in the past year alone. For the record, would you quantify the big picture on what is happening on permafrost? Is this really happening?
Dr. Sheldon Bacon, Dr. Ed Hawkins and Professor Chris Rapley – Oral evidence (QQ 16 – 28)

**Dr Sheldon Bacon:** I do not have the numbers to hand.

**Professor Chris Rapley:** It is regionally variable. It is happening more in some places than in others. Again, perhaps we may provide the Committee with further written material.

**Q26 The Chairman:** That would be very useful. We are looking at strategies that we might be able to apply locally in the Arctic. Could you comment on the mitigation and adaptation strategies in the Arctic itself? Are there particular things that we should be getting on with and doing that will help us to mitigate or to adapt?

**Dr Ed Hawkins:** One possible aspect is emissions of soot in the Arctic, an example of which would be black carbon, particularly from shipping. As I mentioned earlier, the soot can be deposited on the ice and thus reduce its reflectivity. It then absorbs more energy, which increases the rate of melt. We should ensure that we reduce as much as possible such emissions around the Arctic and bear it in mind when considering future growth in shipping. That is one avenue to think about.

The other impact that could be touched on a little is coastal erosion, particularly in Alaska. There is evidence that the removal of the coastal sea ice has allowed waves to erode the shorelines much more than in the past. Protecting shorelines potentially needs to be thought about as well.

**The Chairman:** Alaska has quite a long shoreline.

**Dr Ed Hawkins:** It does indeed, yes.

**Professor Chris Rapley:** That was in part the point I was going to make. The residents, the indigenous peoples, will almost certainly have to retreat from some areas because it will be hugely expensive and quite difficult to protect them. Given that these are small communities, it is probably not cost-effective to do so. Of course, they also see big opportunities with the likely increase in shipping traffic in the summer. There are plans for
large ports and installations that will require monitoring services, support services, rescue services and so on. The people who live in the area are very resourceful—they have had to be. They are looking for opportunities as well as considering the negative side.

**Lord Hannay of Chiswick:** I should like to ask a follow-up question to that. The Arctic Circle is a very thinly populated area. Does it therefore offer quite a bit of scope for the indigenous peoples to move if the climate compels them to do so in a way that might not be the case in parts of the world that are not so thinly populated?

**Professor Chris Rapley:** I am sure that the reindeer herders will be very flexible. Part of their annual cycle is to move considerable distances. The coastal communities are by and large not rich, so poor people are seeing what infrastructure and property they have threatened. I think they will probably have to move, and I suspect that individual Governments may well have to take a position in assisting them to do so.

**Q27 Baroness Symons of Vernham Dean:** Can we turn to the importance of the research going on in this country? I was staggered to learn that 77 institutions in the UK are engaged in research—46 universities and 20 research institutions, as well as others. I was also staggered to see that this is all being done on the princely sum of £50 million, which struck me as being on the low side. I imagine that you would agree and say, “Absolutely. We need to see lots more money going into this research”. The Government’s Arctic Policy Framework says that, “highly regarded UK science is present in most areas of Arctic research and also helps to underpin good policy.” I am sure you would all agree with that, being part of the research institutions. However, are we really able to do our bit on this? Are there areas of research that you think are being neglected for want of money? Can you make some sort of comment on the real value of what this country is able to do? Can you also say how much of the research that is undertaken in this country is actually used by the Arctic Council, and very
particularly within the six working groups? Are there formal links between the working groups and the institutions carrying out the research?

**Professor Chris Rapley:** From my experience, it is certainly true that UK scientists have had an interest in the polar regions, particularly the Arctic, for a long time and that there is plenty of evidence of both excellence and volume of research. I have a background in satellite observations of the earth and I think it is fair to say that the European Space Agency has an exemplary record of developing satellites that use novel instruments to monitor the Arctic, particularly the Arctic ice. It has been UK science that has very much influenced the development of the ERS-1 and ERS-2 satellites—Envisat and now CryoSat. In fact, for many years CryoSat was known as “Duncansat” in honour of Professor Duncan Wingham, who is now the chief executive of the Natural Environment Research Council. I shall leave others to comment on the land side and on the surface side both on the land and in the ocean. The British Antarctic Survey operates the Natural Environment Research Council’s research base, Ny-Ålesund, on Svalbard. Universities and others can use the base to carry out excellent research. BAS’s icebreaking vessel, the RRS “James Clark Ross”, operates in both the Arctic and the Antarctic and carries out ice and oceanographic research. We have good assets and we deploy them routinely to do excellent science.

The connection with the Arctic Council is, in my view, a little more problematic. Certainly when we were developing the International Polar Year, the Arctic Council invited a number of us to make presentations to the plenary sessions because its members were interested in understanding what was being planned, executed and delivered. But my understanding is that the presence of UK scientists on the advisory committees is at best patchy, because there does not seem to be a well established funding mechanism by which they can be delivered. Obviously the FCO has observer status on the Arctic Council and exercises its
position very effectively, but I understand that there is a bit of a gap as regards scientific expertise being delivered to those groups. That is quite different from the Antarctic, where the Scientific Committee on Antarctic Research makes the connection very effectively.

**Baroness Symons of Vernham Dean:** That includes British scientists, but not in the Arctic. Do they want us there or are they actually a bit wary and chary about it? Is it just the money or is it that they are not entirely happy with the idea?

**Professor Chris Rapley:** My experience in the International Polar Year was that they welcomed any insights that would help them with the issues that they were attempting to address. As far as I know, they would welcome UK scientists to the advisory committees, but the Foreign Office view might be different.

**Baroness Symons of Vernham Dean:** But there is no funding mechanism as it is.

**Professor Chris Rapley:** Not that I am aware of, no.

**Lord Hunt of Chesterton:** Voluntary bodies sometimes fund British scientists to go to those meetings.

**Dr Sheldon Bacon:** It is worth noting that there is a different body called the International Arctic Science Committee. UK scientists play a full and active part on that committee and in all its working groups, so that is one vehicle whereby research and advice can find their way to government. The Arctic Council is a rather different organisation in that it is more of an intergovernmental and political body than an intergovernmental research and advisory body. You have picked on an interesting point here. We do not really have much in the way of access to or impact on the Arctic Council.

**Dr Ed Hawkins:** Perhaps I could just add that UK research in my area is very highly regarded. We lead the way in some areas and are very highly regarded in others. There are lots of formal and informal collaborations with the international community. The UK is involved
Dr. Sheldon Bacon, Dr. Ed Hawkins and Professor Chris Rapley – Oral evidence (QQ 16 – 28)

with many international committees, as Dr Bacon has highlighted. In a couple of years’ time we will have the Year of Polar Prediction, and the UK is very heavily involved in it. There are many other committees that UK science is involved with.

Baroness Symons of Vernham Dean: Are there are some bits where we are regarded as the team leaders?

Dr Ed Hawkins: Yes. We are certainly leading the way in some aspects of Arctic research.

Q28 The Chairman: Thank you very much. I want to take us back to the really big picture. Before we finish, perhaps each of you could outline what you think is the most important priority in your own area when considering the recommendations that we might make in our report. I am putting you on the spot a little with that.

Dr Sheldon Bacon: The Arctic is very difficult to understand as a system because there is a dynamical feature called the deformation radius. That can be thought of as the natural turning circle of a fluid. In the Arctic Ocean it is very small, which means that ideally you need to take measurements at a spacing of 5 kilometres in the deep water and 1 kilometre or less in the shallow water. Super-high resolution measurements, indeed not even satellites, do not get down that far, which is a challenge for measurements and modelling alike.

Dr Ed Hawkins: I would say that it is about improved observations in the central Arctic to help validate the models and satellite observations in order to understand how the Arctic varies over all the timescales—from days to decades.

Professor Chris Rapley: For me, it would be to distinguish clearly between two strands. We have heard that the Arctic is a very complicated part of the earth’s system, which in itself is very complicated. Just as an aside, if you wanted to pick something that would be particularly mischievously difficult to model, it would be sea ice. That is because you need to
resolve such small spatial and temporal scales, and the connection between the ocean, the atmosphere and the ice is so complex. On the one hand there is still a huge amount of basic research to do in order to understand how the system works. As we have heard, there is a growing database to work with, but it was poor in the past. Maintaining that in the future will be important.

On the other hand is the issue that has just been raised, which is that of connecting what we already know with the decision-making process. I think that is very important. These two things get entangled and are often muddled together. Separating them and dealing particularly with the linkage between scientific knowledge and the political process—the local decision-making process—is an area that should be developed, because it would be helpful.

**The Chairman:** That is very useful and I am sure that it is something we will pursue. I am afraid that I must ask you rather unceremoniously to make your exit quite quickly so that we can bring in the second team. If there is anything that you feel we have not covered sufficiently and you want to submit further evidence, along with the areas that you have already mentioned, we will be very pleased to receive your material. Again, thank you very much indeed.
[1] The authors were present at the House of Lords Arctic Committee on 15 July 2014 as the members of Panel 1 (the 10.40 evidence session witness panel). This document is a follow-up to the evidence given verbally on that occasion. While we provide an expression of expert opinion, key scientific references (from the peer-reviewed literature) and some web sources are quoted. We summarise our answers to questions asked of Panel 1.

1. **What do the recent data tell us about how the Arctic is warming? To what extent have temperatures increased in recent years, and what projections do we have for future temperature trends?**

[2] The Atlantic-influenced parts of the Arctic Ocean are presently at their warmest for two thousand years according to Spielhagen et al., “Enhanced Modern Heat Transfer to the Arctic by Warm Atlantic Water”, Science, vol. 331, pp. 450-453, 2011, and there is evidence that the summer sea ice extent minimum is at its lowest for perhaps fifteen hundred years (Kinnard et al., “Reconstructed changes in Arctic sea ice over the past 1,450 years”, Nature, vol. 479, pp. 509-513, 2011). At the start of the satellite era (1979), the summer minimum sea ice extent was around 7.5 million square km. With some year-to-year variability superimposed, this value has been trending downwards at ca. 13% per decade (Stroeve et al., “Trends in Arctic sea ice extent from CMIP5, CMIP3 and observations”, Geophysical Research Letters, vol. 39, article no. L16502). The average of the last few years is around 4.5 to 5 million square km, but scientists were surprised by the 2007 minimum, at 4.3 million square km. This was followed by another record minimum in 2012, which reached 3.7 million square km: see the US National Snow and Ice Data Centre website, [http://nsidc.org/arcticseaicenews/](http://nsidc.org/arcticseaicenews/)

[3] There is evidence for a warm period in the Arctic centred around 1940, but this early twentieth-century warming has been accounted for as being due to a combination of factors, including recovery from nineteenth-century volcanic eruptions, a small change in solar activity, changes in greenhouse gas concentrations, possible darkening (by soot) of the snow and ice, and natural climate variability. In contrast, it has been concluded that the late twentieth-century warming is dominated by greenhouse gas increases; see, for example, the US National Oceanic and Atmospheric Administration’s Arctic Report Card for air temperature, at [http://www.arctic.noaa.gov/reportcard/air_temperature.html](http://www.arctic.noaa.gov/reportcard/air_temperature.html)

[4] The temperature data show that the Arctic has warmed at about twice the global average rate, and it is projected to continue to do so in future. This ‘Arctic amplification’ is a consequence of the sea ice retreat allowing more heat absorption by the ocean in summer. This extra heat is released to the atmosphere in the autumn but is then held in the region by the insulating effect of low clouds (see, for example, Serreze et al., “The emergence of surface-based Arctic amplification”, The Cryosphere, vol. 3, pp. 11-19, 2009, and the IPCC Fifth Assessment Report, 2013, particularly chapter 12, section 12.4.3.1).

[5] The Arctic sea-ice assessment from the IPCC AR5 says that apart from coastal areas, the Arctic will likely be reliably seasonally ice-free sometime before 2050, assuming the high emissions scenario into the future (termed RCP8.5), and by 2080 with lower emissions (RCP4.5). There are likely to be individual “ice-free” summers before the Arctic becomes
reliably so. In addition, there is year-to-year and decade-to-decade variability through natural fluctuations in sea-ice extent, so any future changes will not occur smoothly, as evidenced by the years 2013 & 2014 in which the Arctic ice extents have exceeded the extreme low of 2012.

2. What techniques are used to monitor and predict Arctic temperatures? How robust are future projections, and what degree of variability exists?

[6] Arctic temperatures are monitored from land-based meteorological observing stations, from satellites, and in the ocean, from ships, buoys and ice-tethered profilers. Observations are relatively sparse in the central Arctic but coverage has improved over land areas. Satellites also measure sea-ice concentration and, more recently, sea-ice thickness in the non-summer seasons. Additional data exist in the form of ships’ hand-written logbooks, many of which have not yet been digitised, and could therefore be ‘rescued’ to provide additional knowledge of past climate fluctuations.

[7] The Arctic is also a region of high natural variability, since the amplifying process operate for both natural and human-induced changes and their variations. It is plausible that there could be cooling for a decade or more, and no sea-ice melt for a decade or more, even within a long-term warming and melting trend. Future projections are for continued warming at around twice the global average. This is robust and physically well understood (e.g., references to Serreze and IPCC as above). There will be further retreat of the sea-ice, but with natural climate variability superimposed on the long-term trends. The variability of sea-ice is likely to increase as it thins because it is less robust to the mechanical effects of winds and ocean waves.

[8] The exact timing of seasonally ice-free summers in the Arctic cannot be given precisely. It does not depend solely on future emissions. Further research is needed to refine simulations of Arctic sea-ice in order to reduce uncertainty in projections, both in terms of the behaviour of the ice itself, and in terms of the interactions of both atmosphere and ocean with ice.

3. Do you believe, in your areas of study, that the available data on the Arctic is sufficient to make informed policy decisions? If not, where are the gaps and how do you believe that they should be remedied?

[9] Assuming continuity of existing satellite systems, remote-sensed observations are adequate for sea-ice concentration. Also, sea-ice thickness observations have improved in recent years, largely thanks to research and proof-of-concept work by scientists in the UK NERC Centre for Polar Observation and Modelling (CPOM), who led the development of the ESA Cryosat mission. However, as yet there is no plan to replace Cryosat once the mission is complete. Year-round ocean measurements are being made by instrument systems distributed through the water column but moored to the sea bed. Such systems are in place all around the Arctic Ocean boundary, enabling assessment of the net ocean-to-atmosphere transfer of heat. Although the instruments are deployed by a variety of nations through international agreement, their integration into a boundary monitoring array is another UK-led development. Year-round measurements of the interior Arctic Ocean are being made by Ice-Tethered Profilers, but their distribution remains geographically sparse; it would be a great help to have more of these because a higher density of instruments would generate reliable estimates of Arctic-wide heat content changes with higher temporal resolution. Autonomous ocean vehicles (ocean gliders) require more engineering development, particularly regarding under-ice navigation and communication, but an important part of the
future of polar marine measurement lie with these types of vehicle. Lacking are profiles of atmospheric properties over the central Arctic Ocean, which are important for constraining the evolution of the Arctic atmosphere in model “hindcasts”. Technology is in development in the form of surface drifters with upward-looking LiDAR profiling capability. Model evaluation would also benefit from such observations. More data are being ‘rescued’ from historical archives, such as ship logbooks, through projects such as OldWeather: see http://www.oldweather.org Further research is needed into Arctic Ocean biogeochemistry and ecology, and comments on this are given under question 5 below.

4. What changes are we seeing within the Arctic Ocean and neighbouring waterways as a result of rising temperatures and declining sea ice? Is it possible to predict what any future impacts might be?

[10] Declining sea ice has increased marine access to the Arctic. The number of trans-Arctic commercial voyages has increased, from 4 in 2010 to 71 in 2013. Lloyd’s of London, working with Chatham House, took in 2012 a twenty-year forward look at the potential for expansion of Arctic business sectors such as minerals and hydrocarbon exploration and exploitation, transportation, fisheries and tourism in a report called “Arctic Opening: Opportunity and Risk in the High North”, in which it is stated (with caveats) that “Based on current trends, expected investment in the Arctic could reach $100bn or more over the next decade”. The report is available at http://www.chathamhouse.org/publications/papers/view/182839

[11] Scientifically, the single most important dynamical consequence of the reduction in sea ice is the greater exposure of open water to the atmosphere. When the wind blows, instead of interacting with the hard and intractable surface of sea ice, the wind drives the far more responsive water surface. The direct consequence is the generation of waves, on which we comment in question 5 below. In addition, the winds drive surface currents and the overall basin-wide ocean circulation. In present climatic conditions, the circulation of the Arctic Ocean is sluggish, with speeds around 2 centimetres per second, which are much slower (by a factor ten or twenty) than elsewhere in the world. The energy of the wind is presently dissipated largely in deforming the sea ice, by crumpling, diverging, fracturing, compressing and rafting; only a little penetrates to the water. By removing the sea ice, even for part of the year, the efficiency with which the wind can “grip” (formally, transfer momentum to) the ocean increases immensely, resulting in what’s called ocean “spin-up”. This process has already been locally observed in the Beaufort Sea, north of Alaska (Giles et al., “Western Arctic Ocean freshwater storage increased by wind-driven spin-up of the Beaufort Gyre”, Nature Geoscience, vol. 5, pp. 194-197, 2012). Ocean circulation speeds could eventually approach “normal” open-ocean values.

[12] There is an indirect, and potentially significant consequence. The vertical structure of the water in the Arctic Ocean is stratified: very cold waters occupy the top two hundred metres, and also the abyss below about one thousand metres depth. In between lies (relatively) warm water of Atlantic origin. If the Arctic Ocean circulation should accelerate, then the rate at which turbulent mixing occurs would increase above its present, extremely low and quiescent, levels. It is conceivable that this in turn could mix heat upwards from the Atlantic water layer to the surface, where it could impact the base of surviving sea ice, and cause it to melt further. Perhaps the Arctic could thereby transition from a seasonally ice-free state to being permanently ice-free. Turbulence is hard to represent in models, so it is not clear whether the present generation of climate models is capable of representing this type of evolution with accuracy.
5. What land-based impacts are we seeing in the region, as a result of changing temperatures? How might permafrost thaw, for example, impact upon local communities and species?

[13] As a direct corollary of the increased marine access, it is expected that land travel will become more difficult. Ice roads are reliable routes across frozen waterways (lakes and rivers). All eight Arctic states are projected to suffer steep declines of between −11 to −82% in accessibility inland, driven by lost potential for winter road construction caused by milder winters and deeper snow accumulation. Analyses of projections have been published in Stephenson et al., “Divergent long-term trajectories of human access to the Arctic”, Nature Climate Change, vol. 1, pp. 156-160, 2011, and in Smith and Stephenson, “New Trans-Arctic shipping routes navigable by midcentury”, Proceedings of the National Academy of Science, pp. E1191-E1195, 2013.

[14] Multiple effects can combine to increase coastal erosion: coastal sediments are softened by thawing; loss of sea-ice removes a protective barrier; long open-water fetch allows winds to generate waves; and when the waves impact the coast, increased erosion results (e.g. Overeem et al., “Sea ice loss enhances wave action at the Arctic coast”, Geophysical Research Letters, vol. 38, 2011).

[15] We were asked about the future direction of marine ecosystem evolution in response to the warming Arctic environment, and we promised to provide a written answer to this query. Our evidence derives from four papers published since 2011. First, Wassmann et al. published the article entitled “Footprints of climate change in the Arctic marine ecosystem” in the journal Global Change Biology (vol. 17, pp. 1235-1249, 2011). In evaluating documented changes to Arctic marine biota, they found that most reports concerned marine mammals, and particularly polar bears and fish, but that the “number of well-documented changes in planktonic and benthic systems was surprisingly low”: i.e. at the bottom of the marine food chain (plankton) and in the deep water (benthos). They further noted the lack of data from the wide Siberian shelf seas and from the central Arctic Ocean. They conclude: “Despite the alarming nature of warming and its strong potential effects in the Arctic Ocean the research effort evaluating the impacts of climate change in this region is rather limited.”

[16] Second, Popova et al. published an article entitled “What controls primary production in the Arctic Ocean?” in the Journal of Geophysical Research (vol. 117, article no. C00D12, 2012). This study was an intercomparison of a group of five coupled physical and biological ocean models. It makes clear that Arctic marine productivity is dominated by light and by the supply of nutrients, but found that the models disagreed on which of the two factors controls present-day productivity. They concluded that more effort is needed to understand mechanisms of nutrient supply to the Arctic Ocean. This conclusion is expressed simply in the title of the third paper, by Vancoppenolle et al. (Global Biogeochemical Cycles, vol. 27, pp. 605-619, 2013): “Future Arctic Ocean primary productivity from CMIP5 simulations: Uncertain outcome, but consistent mechanisms” (CMIP5 is the fifth Climate Model Intercomparison Project).

[17] Finally, Popova et al. published an article entitled “Regional variability of acidification in the Arctic: a sea of contrasts” (Biogeosciences, vol. 11, pp. 293-308, 2014). This is another model study, and their opening statement is that the “Arctic Ocean is a region that is particularly vulnerable to the impact of ocean acidification driven by rising atmospheric CO2, with potentially negative consequences for calcifying organisms” (basically, creatures with shells). They separate the direct impacts of increasing CO2 concentrations from “indirect”
impacts such as changing water temperatures and stratification, and changing rates of primary production. They find large regional differences in response to projected future changes within the Arctic. These differences depend in turn on factors such as water depth (shallow shelf seas versus deep ocean basins), and on the nature of the inflowing oceanic water, so that relatively warm waters of Atlantic origin would respond differently to very cold, polar waters. Areas affected by Atlantic-sourced inflows would experience minimal increase in acidity (i.e. reduction in pH) because in such regions, declining ice cover would lead to greater vertical mixing, which would make available higher nutrient concentrations in the well-lit near-surface waters, which in turn would promote higher primary productivity: i.e. higher rates of plankton growth, which would consume dissolved CO2. This is also called “the biological carbon pump” because it sequesters (makes inaccessible) dissolved CO2. They conclude with the need for “reliable projections of the rates of retreat of sea ice, which are a major source of uncertainty”.

[18] Thus the present state of biogeochemical and ecosystem research lags the state of knowledge of the physical climate system. Biogeochemical and ecosystem models are highly complex and in need of further development. This is partly because our understanding of important biogeochemical processes is not yet adequate, and partly because progress is needed in critical aspects of our understanding of the physical system, such as bear directly on the biogeochemistry and ecology.

6. Are there climate change mitigation or adaptation strategies local to the Arctic that you believe should be deployed or tested? If so, what contribution should the UK be making to these plans?

[19] Accelerated Arctic warming is an enhanced local symptom of a global issue, and mitigation relies on international agreements on emissions. However, given that deposition of black carbon (soot) increases the melt rates of snow and ice, ensuring a reduction in soot emissions from Arctic marine and terrestrial industry and transportation would help locally. It is worth noting that sea-ice loss is probably not irreversible: if global temperatures were to reduce, sea ice thickness and extent would likely increase.

[20] There has also been recent progress in making forecasts of sea-ice conditions a few months ahead of time (Schroder et al., “September Arctic sea-ice minimum predicted by spring melt-pond fraction”, Nature Climate Change, vol. 4, pp. 353-357, 2014.), but more research is needed to improve the utility of the predictions and use of the resulting forecasts.

[21] One might argue that the best the UK can do in the Arctic context is twofold: to furnish the best scientific advice based on our world-class expertise, and to provide leadership in the international political realm based on that advice.

7. What role does UK research play in developing global understanding of changes happening in the Arctic? The Government suggest that “highly regarded UK science is present in most areas of Arctic research and also helps to underpin good policy”. Is this a view that you would share?

[22] Yes, absolutely. A brief list where UK scientists are world-class or world-leading, considering just climate physics, would be in the fields of climate modelling; ocean and sea ice circulation and processes; the atmospheric boundary layer and cloud formation; the evolution of the Greenland ice sheet; with research focused in the UK Met Office (including the Hadley Centre), NERC National Oceanography Centre (Southampton and Liverpool), the NERC Centre for Polar Observation and Modelling, the NERC National Centre for...
Atmospheric Science, University College London, the Universities of Reading, Bristol and Leeds, and many other contributors elsewhere in the country. The Met Office Hadley Centre has been providing reports directly to DECC and DEFRA, and in addition, many individuals engage directly with stakeholders, typically through briefing meetings or placements.

8. **How extensively is UK science and research used by the Arctic Council and within its six working groups? Do formal links exist between the working groups and UK scientific bodies, or are any relationships more ad hoc in nature?**

[23] The International Arctic Science Committee (IASC; [http://www.iasc.info](http://www.iasc.info), which is a nongovernmental organization, aims to “encourage, facilitate and promote cooperation in all aspects of Arctic research in all countries engaged in Arctic research and in all areas of the Arctic region”. IASC is the “top-level” Arctic scientific advisory body, governed by a Council consisting of one delegate appointed by each of the 22 member countries, which includes the UK. The core elements of IASC are its five disciplinary Working Groups – Terrestrial, Marine, Cryosphere, Atmosphere, Social & Human – with substantial UK representation amongst their membership. World-class UK Arctic research is fed into IASC by this means.

[24] The Arctic Council is “a high level intergovernmental forum to provide a means for promoting cooperation, coordination and interaction among the Arctic States … in particular issues of sustainable development and environmental protection in the Arctic”. The UK has Observer status on the Arctic Council.

*September 2014*
Dr. Sheldon Bacon, Professor Daniel Feltham, Dr. Ed Hawkins, Professor Andrew Shepherd and Professor Chris Rapley – Supplementary written evidence (ARC0049)

Dr. Sheldon Bacon, Professor Daniel Feltham, Dr. Ed Hawkins, Professor Andrew Shepherd and Professor Chris Rapley – Supplementary written evidence (ARC0049)

Statement on Arctic sea ice modelling and prediction, prepared by witnesses in Evidence sessions 2 and 3 of the Arctic Select Committee (oral evidence given on 15 July 2014)

Prepared by Professor Daniel Feltham (Centre for Polar Observation and Modelling, University of Reading), Dr. Bacon (National Oceanography Centre), Dr. Hawkins (NCAS, University of Reading), and Professor Shepherd (CPOM, University of Leeds), with input from Professor Rapley (University College London).

Sea ice modelling

Sea ice is a thin layer and its extent and properties are sensitive to small imbalances in the transfer of heat, moisture, and momentum between the much more extensive and variable atmosphere and ocean. This sensitivity is compounded by nonlinear processes within the sea ice, and between the sea ice, atmosphere and ocean. This makes prediction of the sea ice cover a fundamentally difficult task, whether the prediction is made from climate models that embody our best understanding of scientific laws, or based on extrapolation of existing observations, which is a type of model that is not based on scientific principles.

Due to natural variability (unresolvable chaotic fluctuations) in the atmosphere and ocean, it is fundamentally not possible for a climate model or data extrapolation to make precise long-term predictions of sea ice extent\(^1\) (see figure). The best that can be achieved is that the modelled trends and variability match reality. This has not yet been achieved but there are signs of improvement between the Fourth (2007) and Fifth (2013) Intergovernmental Panel on Climate Change (IPCC) reports.

While there are limitations with climate model representation of the processes controlling sea ice evolution, they are our best tool for future seasonal and decadal predictions of the sea ice state. There are problems, but also successes, e.g. a recent UK study demonstrated the ability to make skillful predictions of the summer sea ice minima up to 3 months in advance [Schroeder et al, 2014]

September Arctic sea-ice extent

Arctic September sea ice decline from 1979 (the beginning of the satellite record) to 2013. The red asterisk is the August 2014 ice extent; the September value is expected to be only

112 of 1144
slightly lower. The September sea ice extent represents the lowest sea ice extent throughout the year. Ice-free conditions correspond to an ice extent of 1.0 million squared kilometres.

**Sea ice prediction**

Sea ice prediction is an active research area and opinion between scientists can be divided. However, the IPCC [2013] prediction of a reliably ice-free Arctic by 2050-2080 (depending on the greenhouse gas emission rate) is the most dependable consensus view. The prediction is based on a rational, peer-reviewed analysis of the climate model predictions, constrained by existing observations.

The witness Professor Wadhams expressed the view that the Arctic would be ice free by 2015 (i.e. from next year the ice extent would be at or below the ice-free line in the figure). The other panel witnesses (Profs. Rapley, Shepherd, Feltham and Drs. Bacon and Hawkins) consider this view to be extreme and unlikely, and it is unrepresentative of the broader scientific community.

**Notes:**

1. In certain regions, accurate local (e.g. 10s km) and short time-scale (e.g. 1-2 day) predictions of sea ice are made using weather data and using short-term extrapolations with sea ice models.
2. Ice-free is defined as an ice extent of less than 1.0 million squared kilometres. The prediction of 2050-2080 is for reliably ice-free conditions, defined as 5 years in a row of ice-free summer conditions. The prediction of 2050-2080 does not mean there will not be ice-free summers before this or that the Arctic will not become routinely navigable by ice-breakers or ice-strengthened ships before this.

**References**


Schroeder, D, Feltham, DL, Flocco, D and M Tsamados [2014], September Arctic sea ice minimum predicted by spring melt-pond fraction, Nature Climate Change, ISSN 1758-6798.

*October 2014*
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

Evidence Session No. 11 Heard in Public Questions 142 - 157

TUESDAY 7 OCTOBER 2014

Members present

Lord Soley (Chairman)
Lord Addington
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Moynihan
Baroness Neville-Jones
Lord Oxburgh
Baroness Symons of Vernham Dean
Lord Tugendhat

Examination of Witnesses

Professor Mike Bradshaw, Warwick Business School, Dr Richard Powell, University of Oxford, and Professor Frances Wall, Camborne School of Mines, University of Exeter

Q142 Lord Soley: I welcome you all. You have in front of you the declarations of interest by Members of the Committee. Lord Tugendhat has added that he is a shareholder in Rio Tinto. Otherwise, the hearing is being webcast, so you are now live. Thank you very much for coming.

If I may start, I want to know how robust you think the estimates are regarding the availability of oil, gas and mineral resources in the Arctic. I am aware of the United States Geological Survey, which is widely cited. I am not sure how robust those figures are and I would welcome any advice on that. Are there other estimates that you think are better or that we ought to be aware of? I am not quite sure who would like to start on that. Let us
start with the mining issue, so perhaps Professor Wall could start. We will then go on to the oil and gas question.

**Professor Frances Wall:** To know how many minerals are in the ground is a notoriously difficult question for the longer term. If you read the numbers that are available, the amount of resource that we know changes over time. The best figures come from dedicated exploration programmes. There are very strict rules on how those figures are reported because, if companies are raising money from investors, the investors have to be sure that those figures are robust. The term “reserve” applies to minerals that can be extracted economically. That term is the closest that you can get to money in the bank, if you like. Resources are less well known. When you see terms such as “deposits” then there are not necessarily any figures associated with those at all. So, how robust? Not particularly robust.

**Lord Soley:** Not very.

**Professor Frances Wall:** When you see figures that say “reserve” or “resource” that maybe state a standard such as JORC or the Canadian standard, National Instrument 43-101, and that is all signed off by a professional, responsible person who takes legal responsibility for that, then they are robust figures. They are the ones to look at.

**Professor Mike Bradshaw:** On oil and gas, the USGS figures, which you mentioned, are probabilistic assessments because there has not been much exploration activity. They are based on geological analogues: looking at similar geology elsewhere in the world and then extrapolating. They are also estimates of technologically recoverable resources. They make no assessment of the economic viability of their estimates of the resource base. They are an informed guess, if you like. It is only once we start to have much more detailed seismic surveys and drilling programmes that we can firm those up and get to the point where a company may declare it has proven reserves and want to book those resources.
As we go through that process of firming up the resource base, so it becomes much more commercially important. The companies initially keep that to themselves, but then when they want to declare that they have a find they have to follow a set of rules and regulations. Rosneft’s recent declaration that it has found a billion barrels of oil in the Kara Sea is partly for the markets but will require further drilling before it gets to a point that they are ‘bookable reserves’. Overall, these estimates should be treated with a good degree of caution. It is only once we have seen much more activity that we will get a better sense of what is actually available in the different areas.

Lord Soley: But not too robust again. Dr Powell, do you agree with that?

Dr Richard Powell: Yes, absolutely. I echo everything that was just said. The USGS 2008 Circum-Arctic Resource Appraisal is the famous one that is often cited. It took a very long time to be produced, for the reasons Professor Bradshaw mentioned. That is part of the reason why there is reluctance to try to attempt another such comparative probabilistic assessment on that level: it is so complicated and it becomes educated guesswork.

Lord Soley: Thank you. That is very clear. Viscount Hanworth, do you want to come in on your question, which follows on from that?

Q143 Viscount Hanworth: I want to ask the panel how important the Arctic reserves of oil and gas are likely to become within a global context. In particular, to what extent might the development of such resources be determined: first, by future prices; secondly, by the development of energy markets; and, thirdly, by geopolitical considerations? The final question is inspired by some remarks by Lord Tugendhat that highlighted the strength of geopolitical issues in determining these futures.

Professor Mike Bradshaw: Perhaps I could make a start on that one. The question of price comes back to the fact that when you look at the supply-cost curves for global oil resources,
you see that offshore Arctic is right out there as being very expensive. One question that is being asked of these resources is whether they can be exploited, given a particular price of oil? Of course, none of us knows what the future price of oil is going to be; there is huge uncertainty about that. Obviously the oil companies tell us that demand will continue to increase and the price will continue to go up, and that therefore we will need these resources. But another school of thought that is gaining attention suggests that we already have enough reserves and that, because of climate change and the constraints that it puts on burning carbon, we do not necessarily need these resources. One of the arguments is that these are not a good investment by the oil companies. I am sure you will hear this line of argument from NGOs: these are unburnable carbon resources and they are very expensive. The cost of oil is going to be critical in working out whether these are economically viable. Much depends on what happens in energy markets. The unconventional oil and gas revolution is a major new factor in this equation, because it gives countries alternative sources of production. So we see in the United States, for example, in a very short time, a rapid reversal of its fortunes in oil and gas production. We have to factor in the relative abundance of unconventional resources and what impact that might have on other high-cost sources such as Arctic. When it comes to geopolitics, you have to look at which countries are holding the resources and the role that those resources play in them. Russia is particularly significant here, because it is the major resource holder and it is running out of conventional onshore oil, not gas. But oil revenues are vital to the Kremlin’s coffers, and sustaining a large surplus to export is critical to the economic future of Russia. Putin sees this very much as the resource for the 21st century. Russia’s continued economic model is based on moving into these high-cost environments. Hence, you see that in Russia in particular sustaining exportable surpluses and maintaining oil production becomes critical,
and the continental shelf and the Arctic become central to that. That is why you have seen in recent years Russia really getting behind a drive to develop offshore Arctic.

**Viscount Hanworth:** So are you saying Russia’s developments might be somewhat insensitive to price?

**Professor Mike Bradshaw:** As ever, nothing is transparent when it comes to these issues; it is a moot point. If it is producing resources that are value-subtracting—in other words, they are costing more to produce than they getting on the market—ultimately the Russian economy pays a price, as we saw in the late Soviet period. There is a school of thought that it does not make sense to pursue these high-cost resources because the return to the state is not significant enough. That is another factor to bear in mind.

**Lord Hannay of Chiswick:** You did not mention one other factor about Russia, which is that this is a country that interferes politically with the pricing policy certainly of gas, perhaps less so of oil, much more than other suppliers do. That is presumably another reason why geopolitics enters into the matter?

**Professor Mike Bradshaw:** Yes, there is a big distinction between the oil market and the gas market. Obviously gas is locked into pipeline infrastructures and the like, and, of course, we see that at the moment with the concerns about Ukraine, so I agree that one needs to distinguish between the two. The extent to which Russia can change the equation relates more to domestic changes in tax breaks to try to reduce to the cost of producing the oil, but once it has been produced and exported it has to take the world price. That is where the uncertainty lies.

**Lord Soley:** So you are saying that oil is less flexible for the Russians?
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

**Professor Mike Bradshaw:** Well, it is a fungible resource; there is a global price. Gas is very different: there are regional prices and we are locked into pipeline infrastructures, as we know to our expense at the moment in Europe.

**Dr Richard Powell:** Yes, I agree. The one thing that I would add from the geopolitics angle is that attention on hydrocarbons in the Arctic is always linked to other geopolitical developments, as was mentioned in the earlier session. That is also part of the pricing. In the late 1970s, there was interest; in the late noughties, there was interest. Maybe some of that interest has cooled in very recent years because of these other geopolitical difficulties or consequences.

**Q144 Lord Hunt of Chesterton:** Vis-à-vis this question of shale gas and unconventionality, “unconventional” is a pretty polite way of describing what we are seeing in North America. Things are getting smaller and it is cheaper, but there are areas of America where you see flames coming out of the ground. We have had legislators here coming from American states having seen the most appalling situations with regard to water, and certain institutions in London are extremely concerned about these resources. Paradoxically, with Russia and maybe Canada, you have the possibility of methane gas coming out of the permafrost as it melts, so you will have a surplus of this kind of unconventional fuel. One question that people do not seem to be getting their minds around is how we will use this uncontrolled kind of fuel. How do you feel the authorities and the market are dealing with this? At the moment, I do not see or hear very much concern about that issue.

**Professor Mike Bradshaw:** Fugitive emissions of methane from shale gas and tight oil are an issue of huge debate in the United States. The scientists cannot agree with each other; the Obama Administration is developing policies to manage methane. It has actually focused minds on the broader issue that you raise, because it is not just the shale gas production but
the pipelines that are leaking and so on. We are carrying out these lifecycle assessments and we need to look at all the energy sources in that light. So I think that is a factor.

It is quite clear that the operating conditions and the economic situation in North America are quite different from that in Europe. I think there is a consensus that we are not going to see a US-style shale gas revolution in Europe, partly because of environmental opposition but also because of the economics and the geology. I heard a presentation yesterday at Chatham House from someone from the Department of Energy in the United States. They are incredibly gung-ho about shale oil and tight gas; they do not see it ending any time soon. If you look at the projections from the Energy Information Administration in Washington, you will see that they are going up and up and they are talking about the economic benefits. So I do not see any move to curtail that in the United States at the moment, although there is growing evidence of the negative environmental and health effects. Ironically, Russia has the largest reserves of tight oil or shale oil. That is an alternative to offshore Arctic for Russia. The issue of methane, which is a much more aggressive greenhouse gas, as something that we need to be concerned about when we are looking at fossil fuels.

Lord Soley: Lord Hunt, could you move on to the mining issue?

Q145 Lord Hunt of Chesterton: Yes. This is a question for Professor Wall. Mining that one sees in high-latitude areas in other parts of the world seems to have quite an environmental impact. How much of the cost is associated with whether it is easy to mine or mining when you clean it up afterwards? If you dig this stuff up, you have all this waste, and then some of it produces air pollution as well in areas that are very pristine. I just wondered to what extent that factor is part of the economics of mineral extraction in the Arctic.

Professor Frances Wall: The first thing I want to mention in that regard is the Kola peninsula in Russia, because it is somewhere that I have been to. That has been mined since the 1930s.
It has the world’s largest apatite mines, which provided the phosphate for fertiliser for the Soviet Union. There is a mine there that provided niobium, a specialist metal that is essential in the steel industry, for the Soviet Union. There are nickel mines there, platinum elements are produced from there. It is a huge mining area that was tremendously important to the Soviet Union. They put resources there, they built the towns there, they moved people there since the 1930s and right up to the end of the Soviet Union. All efforts went into mining and—you already know the next thing that I am going to say—very little effort went into environmental remediation. There is certainly some environmental damage there that everybody can see. You drive along the road past the smelter at Monchegorsk and there are tens of kilometres of black aureole around the town where acid mine drainage from the smelter has destroyed the forest, which is then destroyed by fires. The first thing to say is that the Arctic is not necessarily pristine. It would be a misunderstanding if you thought that it was a pristine environment. There are many beautiful places on Kola—do not think it is a brownfield industrial site either—but there has been mining there for a long time and it is already altered by mining activity. The challenge is to clean up some of the effects of that. The big, exciting challenge is when new mines are opened—whether it is in Greenland or Canada. All those places have mines already, but now when you come to open a mine you must be able to protect the environment when you are mining—all the countries have standards for that—and you must understand how you are going to remediate the site when you close before you open. So a mine must have a closure plan before it can open. The standards have changed very much over that time.

**Q146 Lord Soley:** Can you say how important mining is in a global context? Do we have to have more mining in the Arctic? Could we be doing it elsewhere? What are the benefits to UK industry? Subsea mining and the subsea industry in the UK are quite advanced.
Professor Frances Wall: Do we need mining in the Arctic? I would say yes. That is an easy question. There is already mining there, it is the big industry there, so there would be no reason suddenly to change our mind and say that we do not want any mining in the Arctic. I think it is seen by all the Arctic countries as a very important economic activity. Something like 20% of Swedish taxes come from the iron ore mine in Kiruna. It is very important for countries individually. I have pointed out the importance of the apatite deposits on the Kola peninsula. In the global context, I could pick out the phosphates, again, and nickel as substantial parts of world supply. These are major commodities mined in many places in the world, but there are substantial deposits throughout the Arctic.

Then there are critical metals, which is a different subject area. What we call critical metals are used and mined only in very small quantities—only 100,000 or 200,000 tonnes a year compared with millions of tonnes for base metals—but they are essential for technology such as fuel cells using platinum-group elements or catalytic converters in cars. Eighty per cent of the world’s deposits are in South Africa. The Arctic region across Russia and now a new mine in Scandinavia can also supply platinum-group elements, so if you suddenly took out the Arctic you would be creating an environment in which everybody was reliant on just one area in the world. That is a dangerous position to be in. It does not matter what that country is. It may be a very stable country, but to end up relying on just one place is a very bad position to be in. That could happen very easily with these small-quantity critical metals, so the Arctic is absolutely essential for that.

The other critical metals in that category are the rare earth elements, where China dominates supply. From the European perspective, there are some deposits in Greenland that are quite advanced in terms of exploration and development. Europe has almost no
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

really world-class rare earth deposits, so the Greenland ones are very important in that scenario. Yes, mining definitely needs to be done in the Arctic.

Dr Richard Powell: On Greenland, and echoing that point, there have been claims that 25% of the world’s future supply of rare earth elements could be at Kvanefjeld near Narsaq, where there is a uranium mine belonging to Greenland Minerals and Energy, which is an Australian company. This relates to the earlier part of my colleague’s response: the history of mining is important in the Arctic, and because of the concern about the possibilities of economic development and of environmental impact, the development of the mining is a very contentious issue in Greenland. In the past few days, it has essentially brought down the Greenland coalition Government and new elections have been called for the end of November. The possibilities for development are held within a wider political context of local decision-making, which needs to be factored in.

Lord Soley: I invite Lord Moynihan to ask the next question and I think Lord Addington wants to come in, although some of the environmental issues have been touched on already.

Q147 Lord Moynihan: I would be very grateful if you could concentrate on two issues: the technical and logistical challenges, particularly in oil and gas. First, there is a whole range of issues, such as the lack of infrastructure, supply bases, the challenge in the Arctic of complex logistics, the need for facilities to resist ice loads and how effective loss of well control could be managed. Perhaps you can add to those and give us your thoughts on them.

The second issue is equally large and important and is the legal and regulatory regimes. Dividing it into three, on the one hand regulation is principally by the Governments. I would be grateful if you could let us know whether you regard some states as more effective than others in managing those opportunities and risks. The second area of the legal and
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

regulatory regime is the Arctic Council. While it is limited in its application of guidelines, we would be interested in your views on its current and potential role.

The third group that is directly affected by this is the operators themselves, the companies, not least the oil and gas companies, with their policies and procedures and operational objectives, particularly in the context of safety and environmental programmes. In closing, I would be interested whether there is any validity in Professor Bradshaw’s view that prolonged sanctions would impact work on research and development, particularly in safety and environmental operations, for example the work that BP and Exxon are doing on the one hand and Rosneft on the other through the joint ventures there.

**Professor Mike Bradshaw:** I think you have identified the challenges. I will refer to my experience of watching the Sakhalin oil and gas projects develop over the past 20 years or so, because they are the most obvious analogue that we have for what conditions would be in, say, the Kara Sea. Talking to the operators there, they would say that the individual challenges that you have mentioned are not new. They have faced them in other projects. What is new is the combination of those challenges, the complexity and the fact that you have the problem of access and a very limited operating window. In the case of Sakhalin, much like the Kara Sea, it is about six months, but that varies from year to year. The logistical challenge of getting everything ready is substantial. It means, for example, that with the Kara Sea this year, if sanctions remain in place it will not take long before next year is compromised because they cannot get everything together. The combination and the complexity are clearly a challenge, and that adds cost. We see in the Sakhalin case that it has also pushed the technological frontier and that new solutions have been obtained in particular, for example, in the construction of production platforms with ice conditions and in understanding ice floes and designing the substructures so that they withstand them. In
the case of Sakhalin, there is a large seismic risk, so you have the tsunami threat, which you probably do not have elsewhere, but you have high wave heights. All these things are putting new dimensions into the design and making it expensive, but we are learning by doing and the costs should come down.

The logistical challenges of, for example, towing out the substructures and superstructures and getting them in place in time are remarkable achievements by Shell and Exxon offshore at Sakhalin. It is this combination and multiplication of the challenges that is important. Of course, it is not a single drilling platform out there in today’s Arctic: a whole flotilla has to go with that. I am sure you have heard more about that from the shipping companies.

There is also need to have oil spill response in place and, post-Macondo, to have the technology to cap the well if there is a problem of blow out. All these things require Arctic-class vessels, which are in short supply, and are adding to the complication, the cost and the timeframe. As a rule of thumb, it will probably take a lot longer and cost a lot more to develop these resources, which comes back to my earlier point about whether they are an economic prospect in the first place. We see, for example, that the Sakhalin-2 project was supposed to cost $10 billion but cost more than $20 billion. A lot of that was onshore cost, not offshore cost. I think that we are learning by doing. The cost of some elements will come down, but it is going to be complicated and a very long-term prospect.

In terms of the regulatory issues, I will defer to Dr Powell on the more state-orientated elements and the Arctic Council, but the Sakhalin projects forced the Russian Government to develop a legislative framework for offshore because they had not done it before. They are still learning. I remember talking to Marathon Oil at the time. It had had to get more than 1,000 licences from multiple agencies to install the first production platform. They are trying
to streamline the process, but in streamlining it they might make it less effective. We have to wait and see.

When it comes to the international oil companies and the service companies that operate with them, there is a huge reputational risk associated with operating in the Arctic. Shell has already found that to its cost with its problems in Alaska and prior to that with Sakhalin, where there is the issue of the western great whale. It is interesting that Exxon has been less susceptible to those problems in Russia, and the reason for that is that Shell’s partners went for project financing. Going to the banks and the international financial institutions is what made them accountable and vulnerable to the NGO community, so financing Arctic exploration will be a key issue to consider in the future. I think companies going there are very well aware of the risks, but they bring with them a level of transparency that we do not see if a project is developed by just a Russian company. So you can contrast, for example, the Sakhalin projects with Gazprom’s Prirazlomnaya platform, which had the problem with the Greenpeace protestors. On the more regulatory issues to do with the state, I defer to others.

**Dr Richard Powell:** I again agree. The important thing is that it is very complicated. Regulation differs across states and frameworks. It differs even within Canada because of the complicated geography of indigenous land title processes and the political resolution of land-claims processes, and the different arrangements in Nunavut, the Northwest Territories and Yukon.

When the Government of Greenland were pursuing negotiations for the formulation of their Mineral Resources Act 2009 after the self-rule agreement, they wanted to come up with what they called, under the Bureau of Minerals and Petroleum, a ‘one-stop shop’. The idea was to arrange consultancy and environmental reporting arrangements all in the same place.
But even that has proved to be problematic. So the question of regulation depends on where you are in the Arctic, which means that the regulatory challenges really depend on where a particular initiative will take place.

As you say, the statutory powers of the Arctic Council are relatively weak, although it was formed from discussions about environmental agreements in the first place and was never initially intended to have ‘strong’ powers. There are some historical agreements about the clean-up of pre-1996 pollution and such things. Very recently, as a result of the Kiruna meeting in May 2013, all eight council member states signed the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic. That, for the first time, agreed a set of responsibilities for remediation of an oil spill in the Arctic by one of those states. Basically, the question of regulation is complicated by different responsibilities.

**Q148 Lord Moynihan:** Do you anticipate that there will be a growing influence of the Arctic Council in this context?

**Dr Richard Powell:** Because the oil spill response is a big picture issue, all the Arctic members are under lots of pressure to have a statement about that. I would not anticipate the Arctic Council regulating mineral development in the Arctic unless there are changes in the structure of the Arctic Council, which will take political will on the part of the member states, Permanent Participants and other actors. It is possible, but not immediately.

**Professor Frances Wall:** I have a comment from the mining point of view. The Governments of Canada, Denmark, Norway, Sweden and Finland have well established protocols for exploration and mining development projects. In Sweden, for example, when you apply for an exploration licence, I think you also need an environmental licence before you can start the first steps. They are seen as very favourable places by the world mining community to go and develop projects.
We have heard already about Greenland and the very interesting situation where a small population wants to develop mining. It has to decide how best to do it. It works with the Geological Survey of Denmark, which is very active in Greenland, so it has a very good basis for its original information.

Russia is very much more opaque. I am not an expert on Russian mining regulations. UK companies are working as environmental consultants with Russian operations. Russia certainly is interested in environmental performance. From my own experience, not in the Arctic region but elsewhere in Russia working with Russian collaborators on an environmental project on a mining and smelter site, we found it much harder to get information and to interview people and so on than in, say, Scandinavia. We directly contrasted it with Sweden, which was a much easier environment for anyone to find out what was going on. We found it much more difficult in Russia. I would say that that is a different environment.

I am very ignorant of the Arctic Council, which may say something about how far it has come into the mining community so far. The mining community would not want a double tier of regulations. It would not want the national regulations and then have to satisfy an Arctic Council as well. But it might be useful if a council helped to co-ordinate national regulations. The main onus that I would look at is the operators. An International Council on Mining and Metals brings together the largest mining companies in the world. It puts out guidance, its members have to abide by the global reporting initiative and it is audited. It tries to maintain high standards.

However, most companies are not members of the ICMM and one of the main controls on companies is that when they need to raise money, they will come across the Equator Principles and so on for larger projects. They then have to think about their environmental
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

performance, particularly about the social licence to operate and how they deal with the local people. That is a very big issue which people have to take account of in developing new mining operations.

**Q149 Lord Addington:** You have covered the general environmental concerns. How developed is the accident, the catastrophic event, situation? How developed is that within the companies’ and the Governments’ feeling and planning? When we talked about shipping, we heard just how difficult and how isolated some of these situations and activities are going to be. I wonder how you get that into the structure of any operation taking place in the very remote and cut-off areas, both as regards the activity of Governments and companies.

**Professor Mike Bradshaw:** It is obviously a key concern. I recall Shell having a discussion with the US regulators when US regulators had shortened the drilling season because it was concerned that there would be too much drilling close to a point at which there would not be any access if there was a problem. There was a disagreement about it but it was curtailed. The big issue is that if something catastrophic happens and we do not have access to the field because the ice arrives we would be in unknown territory. Hence the need to have these capping devices—a fairly Heath Robinson solution—to put over the well or the ability to drill a relief well to stop the production.

The problem is the time constraint. If we end up with a substantial spill under ice, of course, the oil companies may tell us that they are making progress but we do not have any evidence because, fortunately, we have not faced that scale of disaster. The NGOs are quite adamant that this would be catastrophic.

It also affects the kind of development strategy that you might have. One of the reasons for putting a production platform offshore is access and drilling. It has become an issue, for
example, on Sakhalin. At the moment, Gazprom has developed a field using subsea production systems, which are provided by FMC Technologies, and it is doing it for gas. It is proposing that it might do it for oil but the problem with that is if you have a subsea production system and there is ice above it and something goes wrong you cannot access it. That would be something to watch.

We really are in uncharted territory. Clearly, the oil companies understand that they have to make progress on this issue but there does not seem to be any consensus that we can deal with oil spills under ice. Moving forward, that definitely would be a concern.

It is not just about the production stage, it is also about exploration. Hence the need for all the preventive measures when doing the activity. There is no easy answer. The companies also point out that the operating conditions are different from the Gulf of Mexico in terms of the depth, the pressures and those kinds of things, and that these wells are not as challenging. But we only have their word that this is the case.

**Dr Richard Powell:** I would just add that the remote and small populations do not have huge capacity for an environmental clean-up in the event of a huge spill or any other catastrophic event. That also plays into domestic politics, certainly in Greenland but also in parts of Canada as well. The sense of huge uncertainty becomes a domestic, internal issue as well, which can lead to political instability.

**Professor Frances Wall:** Some mines are very isolated but others are not. They are connected by road networks and very good rail networks south in Scandinavia and Russia. Each case needs to be looked at individually to assess the risks and how they would be dealt with.

**Lord Hannay of Chiswick:** I note your great caution about whether the Arctic Council is having much impact in this field. Have you come across the testimony that was given in the
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

Swedish Parliament and in the United States Congress, which rather bizarrely said that nobody could identify any implementation activity whatsoever being conducted by either of those two countries as a result of the Arctic Council’s decisions? That presumably reinforces your scepticism.

Professor Frances Wall: I have not read those testimonies, but it is interesting, yes.

Dr Richard Powell: The Arctic Council was set up in a particular way in the mid-1990s, on Finnish and Canadian initiative, to deal with the remediation of pollution in the Arctic. It has since had to take on certain responsibilities. It has been pushed into another place as the wider geopolitical and general public interest in the Arctic has changed. While I agree with some of the cynicism about its capabilities, it is also slightly unfair because it was never designed to do that in the first place. It is an institution that has evolved. That also needs to be remembered when people ask whether it can do this or that: it could, but there needs to be political will by the member states, observers and the indigenous permanent participants to do that as well.

Lord Soley: The Arctic Council is evolving. When we visited the Arctic recently there was quite a bit of discussion on that. I do not invite you to comment now, but if you have any thoughts about how the British Government should relate to the Arctic Council on things that affect your area, it may be no bad idea if you send those details to us.

Q150 Lord Hunt of Chesterton: We have had evidence from the scientific community of the UK. Even though they are invited, they get almost no funding to attend meetings of the Arctic Council. Scientists would like to attend Arctic Council meetings, which are extremely effective. The Arctic Council produces the Arctic Climate Impact Assessment, which is an acknowledged top document, but it is very difficult for the UK to participate because the Government do not regard paying the plane fare for our scientists as worth while. In the
other areas you represent—economic, social, geographic—is there support for UK academics to participate?

**Professor Mike Bradshaw:** It is a particular bugbear of mine that there is little or no funding for fossil fuel research. Understandably, the Research Councils’ mission is to deliver the Government’s low-carbon transition strategy. Less than 0.1% of RCUK’s funding on energy goes on fossil fuels. It is a kind of “mind the gap” problem: we seem to be forgetting that we are still in the fossil fuel age and we have to deal with the problems of the fossil fuel age. Every now and then places such as Russia remind us or we have events such as Macondo. When that happens we expect the capacity to be there. But my point is that we are not really trying to understand the impact of climate change policy and a low-carbon transition on the fossil fuels sector. We really need to look at that. It is creating all sorts of problems. I am not saying that it should be the lion’s share of the funding by any means; I am just saying this is an important issue that we neglect at our cost. We are still dependent on these fossil fuels.

**Lord Soley:** If you want to send in additional information on that or the relationship with the Arctic Council, that would be helpful, so please do so.

**Baroness Symons of Vernham Dean:** Particularly on the points you made about government funding and the percentage spent on fossil fuels.

**Q151 Baroness Browning:** The oil and gas producers have suggested to us that development in the Arctic is usually welcomed by local populations. That is not an experience we have had in this country generally, but do local populations in the Arctic typically welcome new developments? What evidence is there of the socioeconomic impacts on the local population of recent oil, gas and mining developments? Can you comment on
how effective UK companies are at social licensing when it comes to managing mining projects?

Professor Frances Wall: On whether local communities welcome new mining projects, I think the answer is yes. There are always people there who welcome new mining projects. I have done socioeconomic work in Sweden, so south of the Arctic Circle, but the arguments are always the same. I have worked in the north as well on exploration projects. We had to be very careful there not to raise the expectations of the local people. They were really keen to have the economic activity of a new mine, but of course most exploration projects do not come to fruition in terms of opening a mine. You have to be very careful when you go in not to raise people’s expectations. I think that generally across the Arctic people want mining activity because of the economic benefit that it brings to the region.

Baroness Browning: Could you quantify that with an example? What does it do for the local population?

Professor Frances Wall: I read that they have opened a new coal mine on Svalbard because it is almost the only economic activity there. Greenland is another example: they run in deficit now because they used to have a lead-zinc mine, Black Angel, which is now closed. They also had a cryolite mine, which is closed. If they could open two or three more new mines, it would be the mainstay of their economy. It can be really important.

The second thing people say, the negative thing, is, “But we are worried about the possible environmental effects”. Almost everybody you speak to will give the positive of the economic activity and jobs, and the negative of, “We are worried in case there are negative environmental effects”. The onus is then on the company to satisfy the population that there will not be environmental effects, or that there will be very small ones they can live
with, or there then needs to be a decision that the mining does not go ahead. There are projects that are stopped because of that fear.

**Baroness Browning:** Is the take-up of employment from local populations realistic?

**Professor Frances Wall:** Yes, it is. It is the number one issue in mining development around the world. It is not good enough now to go in and open a mine and ship in your miners and all your employees from somewhere else. When you open a mine, you always try to employ the local population and upskill those people as necessary. There is a new programme in Finland, for example, ensuring they can train mining engineers in their local universities so you get the professional jobs as well as the labour jobs on your mines. Yes, that is really important.

**Q152 Lord Soley:** Different countries have very different responses to indigenous people: some are very good, some are very poor. We heard that on our recent visit to the Arctic. As a general judgment, can you say how good UK companies are at dealing with the indigenous population? There was a feeling around, not about the UK particularly, that there was not a good relationship with the indigenous people in a number of situations, whereas one or two other countries—there was an Italian company, the name of which I forget—were regarded as extremely good. I am not quite sure how the UK would come out on this.

**Professor Mike Bradshaw:** Perhaps I could comment on Shell’s experience in Sakhalin. It comes back to the role of international financial institutions, IFC guidelines, the Equator Principles and the like, which empower indigenous people. In developing that project, the foreign investors had to demonstrate that they were dealing with the indigenous people’s issues to World Bank standard, so they hired someone from the World Bank to do that. They developed their own community policies for the indigenous peoples but that created unforeseen problems because the indigenous peoples on Sakhalin are a very small
percentage of the local population and they were divided among themselves, so they had a problem in delivering their policies but they clearly wanted to do it because they were required to do it. How this played out in terms of environmental impacts is quite interesting as the people on the island were not that concerned about the grey whales because they did not even know they were there until the drilling and offshore exploration activity started. They did not see that the grey whale issue had anything to do with their livelihoods. What they were most concerned about was the onshore impact of the pipeline on the salmon fishery because the salmon fishery was an important source of protein for them and a major economic activity. Therefore, there was a disconnect between the global NGO campaign, which was all about saving the whale, and the local concerns, which were also the concerns of the indigenous peoples, about the impact of the pipeline corridor. In that instance Shell and its Japanese partner recognised that internationally they had a duty to address these issues but they were not the local issues. The local issues were much more complicated and were not actually related to a very small indigenous population. It turned out, for example, that the pipeline corridor went through one area which happened to be a reindeer pasture, but there was not a substantial number of people living off reindeer herding, so it was an interesting issue. Elsewhere in Russia, of course, there is not the tradition of civil society and of locals expressing an opinion about these things. I think that RAIPON, which is the NGO representing the so-called “small” peoples of the north, has had problems with the Russian Government of late. I notice on Sakhalin that the NGOs have gone quite quiet now that Gazprom has arrived, so there is not that involvement. Of course, when international NGOs get involved, it can have disastrous consequences in Russia today, so it is not being held to account. Today, on Sakhalin, I think that I am right in saying that 80% of the local government’s revenue comes from oil and gas, and that it now ranks among the most well-
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

to-do regions in Russia, although you would not think it to look at the streets of Yuzhno-Sakhalinsk, but clearly this has made a difference, albeit within a federal structure whereby, if you get a lot from the resources, they take more away in terms of federal transfers.

Lord Soley: Professor Bradshaw, that is very helpful. Have you any thoughts on what else the indigenous peoples need in terms of a voice? Clearly, we cannot interfere in the individual policies of other countries but we were struck by the organisation of the voice of the indigenous people in the Arctic. You are right to point out that the Russian group had severe problems recently.

Professor Mike Bradshaw: I think that they have been much more successful in Alaska. It is interesting that some of the NGOs active on Sakhalin then moved to Alaska when Shell moved to Alaska, so I think the Alaskan case is very different.

Dr Richard Powell: Could I just comment quickly on Greenland? Essentially the country is split 50:50 between those who believe mining will provide for economic independence and those who urge caution because there could be ruinous consequences for Greenland. The key issue is that of developing free, prior and informed consent. Some UK and international companies are better at that than others but currently lots of issues are arising in public consultations, for example, about who pays for translation into potentially three languages. Is it the state—the state may not have the capacity to do it—or is it the companies seeking licences to operate? Lots of these complications are arising in different places, in the Arctic. The picture is better in some places in the Arctic than others but I do not think that anywhere the population is overwhelmingly, 100% in favour of the development of oil, gas and mining. The situation is different for particular projects where specific issues arise.

Professor Frances Wall: You mentioned UK mining companies. It is difficult to respond to that without knowing about the individual projects. However, as has been mentioned and
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

explained very well, there are always different stakeholders with different points of view and it is a question of getting a balance there. There was concern recently about one project because it was going to cut through the path of the reindeer migration and, of course, that is very important to the people there. Reindeer herders further south have been living with mining companies for a long time and that is very well established. What they did not like was the wind turbines that had been put up because the associated roads cut through the paths of the reindeer migration, so it is important that the companies think of all these things. Maybe there is nobody there now but for a month in the year that is a crucial pathway for people.

Q153 Lord Hunt of Chesterton: As regards mining and the development of indigenous people in the Arctic, I know about the Scott Polar Research Institute in Cambridge but I was just wondering whether many other universities in the UK are focusing on this. Is there a co-ordinated interest in the UK on this question?

Professor Mike Bradshaw: There is not a co-ordinated interest. A Siberian studies community is run out of the University of Aberdeen and has a journal called Sibirica. That shows that anthropologists are the most active in Arctic research in these areas but the more traditional social science research is fairly limited. A lot of good work is done at the Scott Polar Research Institute and at Aberdeen University but I do not think that there is a network or community in this regard.

Lord Hunt of Chesterton: Should there be more? Is this an important aspect of the UK participating more in the Arctic? Should this aspect of our capability be improved?

Professor Mike Bradshaw: Again, it is quite cyclical. In the 1990s there was a lot more interest, particularly in Russia, when there was a greater hope that Russia might develop a more positive attitude towards civil society and the rights of these people and allow greater
access to do research. Today, there is more concern about access to do research, for example. However, there are people like Piers Vitebsky at Cambridge who wrote a wonderful book about the reindeer people in Sakha (Yakutia), so there are pockets of expertise. However, I do not think that they are attuned to the wider issues to do with the social licence to operate.

Q154 Lord Hannay of Chiswick: Could we turn to climate change and its effects? Can you speculate a little on whether the future consequences of climate change and its track is likely to help or hinder oil, gas and mineral extraction in the Arctic, both onshore and offshore? Obviously, it would help if you could include in that the possible effect on the permafrost releasing methane.

Professor Mike Bradshaw: As regards the issue of onshore, we have not pointed out that in Russia there is already a lot of Arctic onshore production and more is planned in the Yamal. Of course, there is an interesting history whereby Putin at one point said that climate change would be good for Russia and then his climate change scientists pointed out that it would not for all sorts of reasons, one of which is the level of discharge from the Arctic rivers. The amount of erosion taking place is exposing the pipelines buried under the rivers, so this is an issue they will have to go back and look at. I do not think that it is a black-and-white situation. This idea that suddenly the Arctic is open for all introduces a huge amount of variability, for example, in terms of ice. It does not mean that there is no ice but in key areas this envelope when you can go there and operate is dynamic year on year. I think that the issue of the melting of the permafrost adds to the cost. I am not a physical scientist but I know that the inquiry into protecting the Arctic discussed this at length. Certainly, building on permafrost adds to the cost of major engineering challenges. The onshore production facilities that are built on permafrost are very expensive. At the moment Novatek is building
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

an LNG plant on permafrost in the Yamal peninsula. That is a first and it is having to go to all sorts of lengths to make sure that it does not damage the active layer and so forth, so there are major challenges there. I know, for example, that with the opening up of the Arctic storms result in higher wave heights and so forth. That poses challenges but I am afraid that it is not an area of expertise on which I can comment.

Professor Frances Wall: There are advantages and disadvantages. You often read that retreating ice has exposed new mineral deposits. I did some reading before today’s session but I think that a lot of what I read was not quite right. The rare earth deposits that you read about on Greenland are on the coast and have been known about for many years, so although I know that some new mineral deposits have been exposed, I think that that is not producing new mines as of today. That is a positive factor, if you like, but a much smaller one than you might believe from reading press reports. On the negative side, climate change can affect mines that are already in operation. The Met Office in the UK has a consultancy unit that works with the mining industry to assess climate change factors. I asked them if they were working with any companies from the Arctic region and they said no. However, at CSM—we work with the Met Office—we have done a research project with one of the diamond mines just below the Arctic region. We assessed that they have to deal with having less time in which they can drive over the ice roads—that is, the ice road truckers that everybody has heard about—and that those roads will be open for shorter periods of time. Increased precipitation is likely to be an effect of climate change so they will have to deal with more snow and that can give them slope stability problems and so on. They will probably need to take measures to deal with that, so that is an issue for them.

Dr Richard Powell: I agree with what has already been said, there are potential advantages and potential disadvantages.
Lord Soley: I call on Baroness Symons to deal with the issue of European Union sanctions.

Q155 Baroness Symons of Vernham Dean: We move from climate change to politics. Perhaps I may ask Professor Bradshaw, or ask him first, what he thinks will be the likely impact of the recent EU sanctions on Russian oil and gas as they affect western and non-western companies currently operating in the Arctic region.

Professor Mike Bradshaw: These sanctions are fairly clearly targeted at these projects, and it is as much US sanctions as it is EU sanctions. As you will know, the drilling rig that Exxon and Rosneft had operating in the Kara Sea was the focus of the sanctions, and then the sanctions were tightened to make it clear that that was what they were aimed at, among others. So, yes, the idea of the sanctions is to delay the progress of offshore Arctic exploration, but also onshore tight oil as well, it has to be said. It is early days in knowing what the impact will be, and it is an issue that we are hoping to do further research on. But certainly at the Sakhalin Oil and Gas Conference two weeks ago, the Russian speakers were right up front about it. On their side, I think there was a good degree of annoyance and indignation. People from the Government were saying, “We will develop import-substituting responses”, and, “The Government will finance and support companies affected by the sanctions”. With sanctions, there is always a double-edged sword for them to work, and there are always unforeseen consequences. If the intent is to delay, that is what will happen. Western companies are responding, and not just the IOCs but the service companies too. Companies such as Schlumberger have been withdrawing expat staff from Moscow. There is a good degree of uncertainty about what will happen from now on in. All those things are starting to happen. It was interesting in that section where he (Sechin) was talking about this big find at the Universitetskaya well. He listed all the western companies that had helped, almost to make a point. He talked about Schlumberger, Halliburton and many others as being important.
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

was making the point that it was not just Exxon; there are all these other companies. This is a complex network and we need to understand that. Norway, for example, is concerned about the impact, because many of its companies are involved. The drilling rig came from Norway. It is having an immediate effect, I would say, on planning for next year and in uncertainty. I think everyone hopes that it is a short-term blip, from the industry perspective, and that the sanctions will be lifted because something positive will happen. It remains to be seen what the relational damage will be. Exxon has had to leave, but Rosneft understands that it is because of the sanctions. Exxon is carrying Rosneft financially through this phase.

All these joint ventures have financial carries, so the western companies are providing the finance, their networks and their experience to make the drilling happen. It cannot be possible for Russia to replicate that capacity very quickly. It does not mean that in the longer run they might not be able to do it in certain areas. I know that the shipbuilders are already trying to do more in that area. Of course it would make sense. If you say, for example, that you are going to invest $500 billion in the Arctic offshore in Russia, it makes sense to build your own domestic capacity to do so. One wonders why they have not done it before. The immediate impact is that one well has been stopped, but it has been completed.

There is a huge amount of uncertainty about what happens next year. Is this a good or a bad thing? I would be worried if the likes of Rosneft were saying, “We will carry on regardless”, because I do not think that they have learnt enough from this operation here or in Sakhalin to be able to do it themselves to the same standard. So there is a danger in isolating these companies from this international network of service providers.

Lord Soley: Might not one unforeseen circumstance also be growing co-operation with China?
Professor Mike Bradshaw: Yes, but that is a question of technical ability. There is no evidence to suggest that the Chinese necessarily have the ability to do this either. There is a shortage of ice-class drilling rigs, but onshore that is certainly a possibility.

Lord Moynihan: I just wanted to pick up on that point and the geopolitics of this. It was interesting that he went further than that, did he not? He talked about the West and co-operation as co-operation between friends. In Russian terminology, that was a very important and significant comment. Would you not have interpreted that as a signal that, post-sanctions, he seeks to return to relations with the West, and would encourage them not to go away, and would encourage them to retain the relationship as long as they can, aware that the Russians treasure that relationship more than looking to the East? But while they are definitely looking to the East at the moment, and the negotiations with China have a different priority than they have had ever before in the hydrocarbons sector, the reality is that the signals that are being sent from Moscow at the moment, both by the Foreign Minister and by Rosneft, would indicate a willingness to continue the co-operation in time, despite the current sanctions.

Professor Mike Bradshaw: I think that is probably true. It is not that long ago that Putin invited the international oil companies back to Russia after we had these episodes with Shell and BP and so forth, recognising the need for foreign participation. They understand full well that if they are to carry this out it has to be with joint ventures, and because of all the reasons we have spoken about. The Chinese offer something else: they offer finance and a market. But they do not offer that technological capability, so it would not be a good idea to say, “Right. Well, you can’t come back”, because they fully understand the extent to which they need these companies. There has to be a way back. But I wonder about the extent to
which, at the same time, they are going to be much more conscious about the need to learn and the need to develop domestic capabilities in many of these areas.

**Lord Soley:** We are drawing to a close. A final, quick question, Lord Hannay.

**Q156 Lord Hannay of Chiswick:** It is probably impossible to answer this, but I imagine that you cannot really separate out the geopolitical sanctions effect, which we are talking about, and the effect of movements in the oil price. Presumably if the oil price continues its downward path not very much further, not many western companies would want to invest in these extremely expensive resources, at least in the short term.

**Professor Mike Bradshaw:** I think one of the issues is the need to book new reserves. The international oil companies do not have many choices. They talk about the end of easy oil, but that is the end of their access to easy oil. There is plenty of easy oil but it is in the Middle East and is not available to them. Going to the Arctic is part of this desire to access new reserves. Even if they book reserves and do not develop them, it has had a benefit on their balance sheet. How low the price will go is again the interesting question, given the importance of unconventional oil and gas, which requires a rather higher oil price than conventional. These companies will not enter into loss-making activities willingly. All sorts of sweeteners may be put in place, but reserve access is critical. They have little choice. Wherever they go it is going to be high risk and higher cost. They have this technological edge at the moment. I think we need to watch this. Once it gets to the development stage, those difficult questions will have to be asked.

**Q157 Lord Hunt of Chesterton:** During the Cold War, and despite the Cold War, there was very close scientific and technical collaboration between the West and Russia, including weather forecasts every day and all that stuff. In this situation, is this not an area that we should also consider maintaining? There could be some cutback in commercial exploitation,
but do you believe it would be possible to have a closer collaboration with the Russians at an R&D level?

**Professor Mike Bradshaw:** I cannot comment on the scientific co-operation, but within the industry there is a lot of co-operation. I tend to think that it is not in the interests of the western companies to give up their secrets because that is their competitive edge. They do not want to transfer the capacity to replicate these projects. That is true of the service industries as well. There is a limit to co-operation there. I cannot comment on the scientific side.

**Lord Soley:** Dr Powell and Professor Wall, do you have any final comments on anything that has been said so far?

**Professor Frances Wall:** On the scientific side, there is certainly a lot to be gained by co-operation between European and Russian countries. There used to be a particular European pot of money, with the acronym INTAS, which encouraged such projects. There were quite a few of those, but that is finished now, and you have to incorporate Russian partners into, say, European Union proposals. That is possible, but it is not encouraged quite so much as it was.

**Lord Hunt of Chesterton:** Encouraged by whom?

**Professor Frances Wall:** Encouraged by the funding guidelines, if you like. With INTAS you had to have at least one Russian partner to get that money, whereas now it is not necessary. But if you want to, you can try to incorporate them.

**Lord Soley:** I think that we must close there unless you have anything burning to say. Thank you. If you have any other views, please send them in. If you feel there is anything that we have not covered that we should have covered, do not hesitate to write in. I thank you very
Professor Michael Bradshaw, Dr Richard Powell and Professor Frances Wall – Oral evidence (QQ 142 – 157)

much for your co-operation and your time. You will get a transcript of the notes in due course. I am grateful to you and thank you very much indeed.
When I gave evidence to the Arctic Committee on Tuesday 7 October 2014 I was asked a question about support for research on Arctic oil and gas issues. I responded that there was no special funding for such research; in fact there was hardly any funding available from the Research Councils UK (RCUK) to study fossil fuels more generally. I was asked to provide further written evidence on the topic.

During hearing I noted that the vast majority of funding in RCUK’s energy theme was dedicated to achieving the low carbon transition, which is understandable. However, fossil fuels will play a major role in the UK’s energy mix for sometime to come and declining domestic production will mean increasing import dependence. This is not a problem if properly managed, but it does mean that we need to pay much more attention to developments in international oil and gas markets. I have doubled checked and of the £807 million RCUK Energy Theme portfolio the share allocated to oil and gas is 0.1%. I do not know what this has been spent on. Fortunately, there has been some funding for fossil fuel research in the second phase of funding for the UK Energy Research Centre (RCUK) that has recently finished. Under this phase I did receive funding for a project on ‘Global Gas Security and Governance: implications for the UK’ that did consider the impact of US shale gas on global gas markets.’ As part of the project, we developed a supply chain approach for assessing UK gas security. In the third phase of UKERC funding, together with colleagues at UCL, I shall be involved in research on the global impacts of unconventional oil and gas and the role of gas as a bridge to a low carbon future in the UK.

The Committee may recall that the Royal Society’s 2012 report on Shale Gas Extraction concluded that: “Further benefit would...be derived from research into the public acceptability of shale gas extraction and use in the context of the UK’s energy, climate and economic policies”. They recommended a cross-council research programme involving NERC, ESRC and ESPRC. I have lobbied hard the last two years to try and get this funded, but was told this summer that ESRC could not find the funds to support a social science research project on the shale gas debate in the UK. Together with colleagues, I am now leading a ‘Responsive Mode’ (open competition) application to get such a project funded, but there is no guarantee of success and the Royal Society’s recommendation goes unheeded.

Fortunately, there may be some light at the end of the tunnel. In the last couple of weeks, NERC (also on behalf of ESRC) has contacted UK Universities to find out about current research capacity on oil and gas, including social science competence. It is not clear why they are doing this and we must wait and see what happens next.

What I have said above is probably just as applicable to social science research on the Arctic. As ESRC does not consider it to be a priority (and there is no reason why it should), the only way to get funding is to apply through open competition.

October 2014
Introduction

1. The British Antarctic Survey (BAS) is a component institute of the Natural Environment Research Council (NERC). BAS undertakes a programme of world-leading interdisciplinary research in both polar regions that advances our understanding of Earth, and which will benefit society. Through its extensive logistic capability and polar know-how, coupled with its expert scientific support staff, BAS also provides access to the Polar Regions for the UK science community and its international collaborators. BAS has a commitment to excellence in science and to safe and efficient operations which helps it sustain a leading position for the UK in Antarctic affairs. BAS would welcome the opportunity to provide similar support to the UK in the Arctic. (For more information about BAS visit www.antarctica.ac.uk).

2. BAS welcomes the opportunity to respond to this Call for Evidence on its own behalf. BAS does share views that have been submitted elsewhere, particularly in the responses from NERC and NERC’s Arctic Office.

Background

3. Since its establishment in 1962, BAS has been a leader in Antarctic science. In initiating our current science programme in 2009, “Polar Science for Planet Earth”, BAS began to develop a portfolio of research in the Arctic. Some of these activities complement those undertaken in the Antarctic, while others address purely Arctic issues. At present many of our Arctic activities are collaborative, however, we have a growing impetus to lead specific science programmes and to help coordinate sections of the science community. Our growing position in the Arctic stems from the expertise gained over many years of operation in the Antarctic. For example:
   - BAS led a consortium of 24 institutes from 16 countries in a European Union (EU) funded programme, which led to reductions in uncertainty about the contribution of glaciers (including the Greenland ice sheet and Arctic glaciers) to future sea-level rise (www.ice2sea.eu);
   - BAS has deployed a suite of atmospheric monitoring instruments mounted on one of its Twin Otter aircraft to investigate cloud formation in the Arctic; cloud formation has been identified as an issue limiting the performance of climate models in Europe;
   - BAS is currently leading a flagship, multi-national programme funded by the EU on sea-ice change in the Arctic, coupled with physical, social and economic impacts (www.ice-arc.eu).

4. BAS is currently redefining its science strategy and in so doing intends to enhance elements of Arctic science. The BAS science and logistic platforms (ships and aircraft) are available for use wherever needed, including in the Arctic. Where such activities are outside the Antarctic, and in order to meet Government budgetary requirements, BAS must recover costs of deploying these platforms in science support roles and on commercial charters. Since 1991, BAS has operated the UK’s only Arctic science station on Svalbard on behalf of NERC. This station exists within the international science facility at Ny-Ålesund, which is managed by the King’s Bay Company. This station receives specific funding of around £150k per year from NERC and provides a key resource for the UK Arctic science community.

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3 Submitted by Director of Science, Professor David Vaughan on behalf of BAS – 4th July, 2014. Prepared by Professor D. G. Vaughan, Dr. E. Shuckburgh, Dr. P. Trathan, Professor J. Francis., Dr B. Schlarb-Ridley.
providing cost-effective access to the polar environment for studies in terrestrial and coastal biology, glaciology and geology.

**Question 1. What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?**

4. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2007) noted that “multiple lines of evidence support very substantial Arctic warming since the mid-20th century”. This warming significantly exceeded the global average. Over the last two decades, accelerating ice-loss from the Greenland ice sheet has been documented, and Arctic sea ice and Northern Hemisphere spring snow cover have continued to decrease in extent. There is also high confidence that permafrost temperatures have increased in most Arctic regions since the early 1980s. There is some evidence of an increase in precipitation in most pan-Arctic land areas over the past few decades.

5. In coming decades, it is considered very likely that Arctic sea ice cover will continue to shrink and thin and that Northern Hemisphere snow cover and near-surface permafrost will be reduced in extent over the 21st century. Projections indicate that by the mid-century there are likely to be substantial changes in other climate parameters, such as storm tracks and precipitation, throughout the Arctic. The impact of these Arctic changes is likely to be felt further afield and even in the UK and Europe.

6. The impact of climate change has already been observed in the ecology and hydrology of Arctic lakes, and terrestrial and marine ecosystems. Future changes including increased atmosphere and ocean temperatures, reduced sea ice cover, ocean acidification, thawing permafrost and changed precipitation patterns have the potential to further impact these ecosystems, to affect infrastructure and related services in the Arctic, and to exacerbate existing vulnerabilities of the populations living in the region.

7. Changes in the Arctic have the potential to impact the UK through their influence on the persistent patterns of atmospheric circulation across the northern hemisphere (e.g., the North Atlantic Oscillation), loss of glacier ice contributing to global sea-level rise, and through changes to the ocean circulation in the Atlantic Ocean (e.g., Meridional Overturning Circulation). Each of these processes will impact the UK directly, and each is an area of active and urgent research. Changes in the Arctic are also associated with possible abrupt or irreversible events that would impact global climate, such as the melting of the Greenland ice sheet, changes to the Meridional Overturning Circulation in the Atlantic Ocean, release of greenhouse gases (methane and carbon dioxide) from permafrost, and from terrestrial and marine sediments (clathrates). Such events are, however, generally considered to be unlikely to occur during the 21st century.

8. In recent years, the UK science community has played an important role in observing climate change and its impacts in the Arctic. The task for science in future years will be to address squarely, key scientific questions around improving projections of future change and its impacts. Improving these projections will inform options for adaptation and increase resilience, and reduce risks to Arctic communities and commercial activities. However, to fully achieve the potential benefits will require a coordinated and strategic approach.

**Question 2. Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities, and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?**
9. The changes will likely lead to new opportunities in a variety of commercial sectors: in particular: shipping, mineral and hydrocarbon extraction, tourism and fisheries. The degree to which these opportunities will arise as a result of climate changes, and the degree to which they arise as a result of other factors (e.g., improved technology, widening of commercial awareness of Arctic opportunities) cannot be fully disentangled. Similarly, how these economic opportunities are taken up by commercial interests will depend upon national and international policies and regulation.

10. Taking a lead from NERC’s strategy “Business of the Environment”, BAS acknowledges its responsibility to undertake science that underpins responsible development of Arctic resources, reduces risk and enables sound stewardship of the Arctic region. BAS will also seek to provide balanced and timely advice to UK Government on issues of Arctic management and governance, and underpin evidence-based policy-making.

**Question 3. How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?**

11. See paragraph 10 above.

12. There is an urgent need for baseline studies of Arctic marine ecosystems, and these need to be initiated before direct human impacts begin to make understanding of the pre-exploitation state impossible. Such studies may eventually allow the underlying causes of changes in these ecosystems to be ascribed. For example, changes in marine mammal or seabird populations could potentially result from:

- A local expression of global climate change (e.g., through temperature rise or sea-ice retreat) affecting local food-webs;
- Specific local activities (e.g., increased shipping, or initiation of mineral extraction activities) that pollute or cause disturbance to critical habitats or food-webs;
- Global biogeochemical changes (e.g., ocean acidification) affecting critical life-history stages of prey species in local food-webs;
- Regional ecosystem disturbance (e.g., from fisheries) leading to by-catch of animals, or resulting in competition for prey.

For over 30 years, BAS has carried out sustained research in support of the ecosystem-based framework used to manage Antarctic fisheries. Through the Polar Regions Department of the FCO, BAS provides scientific information and advice to the international Commission for the Conservation of Antarctic Marine Living Resources. CCAMLR currently manages three important fisheries, including Antarctic krill, a species that is also important in the diet of many marine mammals and seabirds.

**Question 4. What are the human aspects of the expected climatic and economic changes in terms of local populations, current and future?**

13. Climate change and associated changes to the marine and terrestrial environment of the Arctic will probably affect local populations through impacts on social and economic factors such as food security, access to resources, and infrastructure. The rapid rate of change projected for the region is likely to make adapting to environmental change particularly challenging.

**Question 5. Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?**

14. There are many areas where improved data would provide greater certainty on the magnitude, pattern and severity of current changes and increase confidence in projections.
15. For several key parameters (e.g., sea ice extent, atmospheric temperatures, glacial contribution to sea-level change) current data series acquired over several decades are adequate for measuring and mapping change but are too short to quantify natural variability on timescales of centuries to millennia. Improved use of climate proxies (e.g., from ice and marine sediment cores) would be valuable in improving understanding about the interaction of natural variability and human-induced climate change, and thus improving confidence in projections.

16. As noted above (12), the assessment of the structure and function of Arctic marine ecosystems is not well developed and may, in the future, severely limit our ability to assess change, and determine the cause of those changes.

17. For sea ice, good records of changes in ice extent exist for more than 30 years, but detailed and specific parameters required by shipping companies to assess risk and evaluate business opportunities are much more poorly known. Ice-thickness, for example, has only been comprehensively measured for a matter of a few years, while other parameters (snow-cover, ridge characteristics, etc) are still not monitored on a pan-Arctic basis.

18. The quantification of methane in near-surface terrestrial permafrost and marine sediments (as clathrates) is only poorly assessed. The hypothesis that warming of the atmosphere, permafrost and/or coastal seas could release considerable quantities of this potent greenhouse gas, which would constitute a strong positive feedback amplifying climate change, will not be tested until more data on the distribution and release of methane has been acquired.

19. Monitoring of the current state and emerging changes in ocean circulation in the Arctic and the characteristics (temperature and salinity) of Arctic water masses is urgently required.

20. Both Arctic glaciers and the Greenland ice sheet require ongoing monitoring to determine their future contribution to sea-level rise, and to identify patterns of change that can be used to test and thus improve projections of change.

Question 6. Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?

12. No response.

Question 7. Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

13. The geo-political environments of the two polar regions are quite dissimilar. However, the UK has a significant voice in each.

In Antarctica, the UK was one of the original signatories to the Antarctic Treaty, and through vigorous diplomacy and scientific leadership continues to maintain a considerable voice in the Treaty system. Similarly, the UK was one of the original signatories to other legal instruments operating in the Antarctic and Southern Ocean, including both CCAMLR and the Agreement on the Conservation of Albatrosses and Petrels.

As one of the nearest neighbours to the Arctic, the UK has a unique non-sovereign role and one in which science could provide an important pillar. Through the UK’s observer status at the Arctic Council, our non-sovereign status means that UK science is well positioned to provide unbiased advice particularly on issues of stewardship. This, coupled with existing UK skills and knowledge about accessing remote and hostile environments to address globally important scientific questions, as well as UK experience in managing multi-national scientific
collaborations, means the UK science community could provide strong support to influence Arctic affairs.

Question 8. How effectively does the UK interact with Arctic governance structures? Is the UK Government’s approach, as set out in the Arctic Policy Framework, proportionate and appropriate?

14. No response.

September 2014
Q260 The Chairman: Good morning. I welcome you to what is already the 20th evidence session of the House of Lords Arctic Select Committee. You will have had a copy of all our interests, so you will know those. I remind you that this session is being broadcast. As it is 11 November and Remembrance Day, when we get to 11 o’clock I will ask that we observe two minutes’ silence. Those who are in the public gallery and my colleagues will stand to recognise that, after which we will resume the session. Perhaps we could start by asking each of you to introduce yourselves briefly and then we will move straight on to the questions. I think that you should already have some inkling that the type of area that we
are looking at is research. That is our first topic this morning. Perhaps I could ask Professor Dowdeswell to start.

Professor Julian Dowdeswell: I am Julian Dowdeswell. I am the director of the Scott Polar Research Institute in Cambridge University. By way of background, I study glaciers and ice sheets, both past and present. I have also been involved for many years in Arctic and Antarctic science policy.

Professor Jane Francis: I am Professor Jane Francis. I am director of the British Antarctic Survey. I am a geologist by training and I have worked in the Arctic on science projects.

Dr Ray Leakey: My name is Dr Ray Leakey. I am Arctic Research Theme Leader at the Scottish Association for Marine Science in Oban. I am a marine microbiologist and a biological oceanographer.

Q261 The Chairman: Perhaps it is also appropriate that we express our condolences to Dr Leakey over the sudden death in August of the SAMS director, Professor Laurence Mee. We were very sorry to hear of that.

We have clearly taken quite an interest in research in the Arctic, both in terms of it being an area where there are probably a lot of gaps and it is quite difficult to do that research, and also in terms of it being a very international area. Perhaps we could start by asking what the priority research area for UK in the Arctic has been over the last decade. In which areas is UK Arctic science particularly strong? We visited Svalbard but unfortunately we were not able to get to the research station due to the weather. We did have some witnesses to talk to us about this area but we are interested in your comments.

Professor Julian Dowdeswell: The first thing to say is that UK science in the Arctic has tended to be responsive to particular science questions rather than being driven by either research council policy or wider policy. That said, the Arctic is clearly an important part of
the linked atmosphere/ocean/cryosphere system, and then some problems that relate to
the UK come very clearly out of that. The way that ice sheets, and the Greenland ice sheet in
particular, are responding to warming is fundamental to global sea levels and it is therefore
of direct relevance to the UK and to various planning things to do with flooding in the south-
east of England, for example. The same is true of the ocean circulation. Changes in the Arctic
to sea ice, glaciers and ice sheets are affecting the circulation. Therefore, while the research
has not tended to be driven explicitly by those questions, I think they are of key interest to
scientists. Therefore, those have been two of the foci. There are more but those have been
two.

In terms of expertise, the UK has a very strong reputation in Arctic science among the
international community. That has placed us in the forefront in setting the science agenda in
the Arctic in groups such as the International Arctic Science Committee and so on. But there
is a particular expertise: in our sea ice, glaciers and ice sheets over the cryospheric part of
the system, in ecology and polar ecosystems, in polar oceanography and indeed also in the
bathymetry in the marine geology and geophysics of the Arctic. Those are a few of the areas
that I would pick out.

Professor Jane Francis: I think also that atmospheric science—understanding clouds—in the
Arctic is particularly important for climate modelling. The interaction between the
atmosphere and the sea ice is also a major topic of research, and I think that we have great
expertise in that. That is quite important because it is changing as the sea ice is melting. It
has a fundamental influence on climate.

Dr Ray Leakey: I would add in terms of instrumentation and technology that there are some
areas where the UK leads: in marine observation through Autosub and autonomous
instrumentation. So the UK can contribute in those areas in which other Arctic nations may not be quite as strong.

Q262 The Chairman: Perhaps I could just follow up on one thing. Clearly, Professor Francis, you are in that position, but we are particularly known for our Antarctic science. In Svalbard it is effectively the British Antarctic Survey that brings to bear. Does that badge portray the UK’s effort as being second-rate—perhaps not second-rate but junior—to our Antarctic efforts or does it not have that connotation in any way? Is it a benefit or a bit of a misnomer, a bit of a problem?

Professor Jane Francis: I think it is a bit of a misnomer, but you have put your finger on an important point. Because the Antarctic is so big, and because it is one continent, remote and difficult to get to, the British Antarctic Survey provides the forum—the logistics and operations—for going to Antarctica. It is very clear that if a member of the UK community wants to go to Antarctica, they have to go through BAS to get logistic support. That is very visible via BAS. In the Arctic, you can actually work as a one-man band. If you get funding you can go to the Arctic quite easily—not necessarily through a UK agency that provides support, because there is not particularly one at the moment. You can work at the Ny-Ålesund base but a lot of UK scientists work around the Arctic in collaboration with other nations. That requires them to obtain funding and then to work with other nations. There is not so much coherence in the Arctic community. We are beginning to try to develop that. There is a new initiative called the UK Polar Partnership, or we now call it the UK Arctic and Antarctic Partnership. The idea is to try to bring together the whole polar community. There are about 400 or 500 scientists in the UK who work in the Arctic, but they are dispersed. We just about know who they are now through meetings that we have organised. The UK Polar Partnership is an attempt to bring together the whole community, particularly the Arctic community.
British Antarctic Survey, Scott Polar Research Institute, and Scottish Association for Marine Science – Oral evidence (QQ 260 – 272)

Their steering committee has met within the last month and we (the three of us here) are all on that steering committee. The idea is that we will organise events and try to bring together the Arctic community to be a little more influential and a bit more coherent, with a proper strategy for Arctic science.

The Chairman: Just before we move on, it is very interesting that you mention that we have maybe some 500 UK scientists there. We would be very pleased to take that as written evidence if you had something that told us a little more about that.

Professor Jane Francis: I get that number from the Arctic Office, which sits in the British Antarctic Survey in Cambridge. In the last few years we have had an initiative where we have tried to get the Arctic community together in a UK biennial Arctic science meeting. It is a very informal meeting of Arctic scientists who meet for one or two days at a conference to talk about science. Over that time, the Arctic Office has compiled literally an e-mail list of people attending those meetings. There are about 400 people on the Arctic one. That is where that number comes from. We can give you that but I am not sure that it captures everybody.

Dr Ray Leakey: I would add that it covers at least 60 institutions. In some cases, there is just one individual from an institution and in others several.

Lord Hannay of Chiswick: Could I just ask Professor Dowdeswell a supplementary question? I noted and welcomed very much what you said about focusing on the melting of the Greenland ice cap and the effect on water levels. Does anything in your research tell you what is causing the melting of the ice cap? Are you able to cast light on the vexed question as to whether it is caused by human activity or simply by some change in climatic conditions which have nothing to do with human beings?
Professor Julian Dowdeswell: In Greenland we are observing the consequences of the warming, not the source of the warming. The consequences are that much more meltwater is being produced on the surface of the ice sheet. The bed of the ice sheet is also changing. That is speeding up some of the important outlet glaciers there and allowing more mass to be redistributed back into the global ocean. Of course, it is a bad art to some extent but that is another topic.

Lord Hannay of Chiswick: There is nothing in your research that goes back far enough to indicate whether this is a phenomenon that has occurred before with no human instrumentality.

Professor Julian Dowdeswell: In terms of timing, it is clear that things have changed markedly on the Greenland ice sheet since about 2000 or shortly afterwards. That, as you will know, coincides very greatly with the increase in the cocktail of gases in the earth’s atmosphere. It has increased particularly greatly since about 1980. So there is a very strong association between the two. The Greenland ice sheet was not a particularly active player in the global sea level story before about the turn of the 21st century.

Lord Tugendhat: I have a small question in the light of Lord Hannay’s question. I recall reading not long ago in a biography of Sir Joseph Banks that when he was president of the Royal Society he was very worried about the melting of the polar ice cap. So my first question is: as far as we know, was Sir Joseph Banks’ concern justified? Secondly, do we know what the cause of the melting at that time would have been by comparison with what is happening now?

Professor Julian Dowdeswell: That is quite curious. I remember reading something very recently about Captain Cook and his non-discovery of Antarctica—of course he circumnavigated the Southern Ocean, but the furthest south he went was one of the big
embayments in Antarctica. He concluded in the 1780s that it must have been a very bleak and very cold place that could not possibly be of interest to humankind. So I am a little surprised to hear that Banks was so concerned about melting. Although some decades were colder, that period was the little ice age, when the climate was a little cooler than it is today.

**Q263 Lord Oxburgh:** We have heard a little from you in your previous answers about co-ordination of Arctic science within the UK, but what about at an international level—does that come about? What about the International Arctic Science Committee? Would you like to talk about those?

**Professor Jane Francis:** I would just like to add to the last comment that I made about the UK polar community. There is a big project funded by NERC—the Natural Environment Research Council—which now has one or two years left to finish. It is a very large programme, the Arctic Research Programme, managed by the Arctic Office in BAS and funded by NERC. It is a really big programme—£15 million-plus, I think.

**Lord Oxburgh:** That is total, not per annum?

**Professor Jane Francis:** Total, yes. It involves 16 different projects across the Arctic. That is a co-ordinated effort now; it is ongoing. We have initial results from some of those projects. Those are across the board, everything from terrestrial ecology to atmospheric science to working on the Eurasian shelf looking at methane, oceanography—there is a huge range of projects through it. It comes to an end in a couple of years. It is short term and I hope that we can establish something a bit longer term after it.

**Lord Oxburgh:** Can we just pursue the composition of that for a minute and ask whether there is a coherence to the programme as a whole, or does it represent what are seen as the best intellectual proposals for working the Arctic from a variety of sources?
Professor Jane Francis: I think they are the best UK science expertise. Some effort will be made to coordinate results, I know, but the project is going to be extended to ensure that everything is brought together so that all the information is compiled. But is there a UK arctic science strategy? No, not that I am aware of.

Lord Oxburgh: Who would like to comment on the international summit?

Professor Jane Francis: I can start off on that. As I mentioned, I think that a lot of people in the UK do work with different countries, and we here have all worked with different countries. We have memoranda of understanding with Canada and Norway to provide support in different countries. Obviously a lot of the Arctic is territorial land around the Arctic. There is an awful lot of collaboration through scientific cruises on ships. Working in the Arctic, wherever you go, even on the land, it is remote, it is expensive and access is difficult. So, on the whole, apart from Svalbard, where you can go quite easily, most of these expeditions are quite large logistic efforts. There are a lot of people working in international teams. In fact, even the NERC Arctic Research Programme includes a huge number of international partners. In terms of IASC, I will hand over to Julian because he has had some experience of it.

Professor Julian Dowdeswell: I was the UK delegate to the International Arctic Science Committee for some years. One of the aims when I was on the IASC council was to try to bring together the different subgroups who were studying Arctic science—some emphasising activity in some countries, others relating to other countries and other projects—to try to bring those things together under the umbrella of IASC. Rather as the Scientific Committee on Antarctic Research is the major single co-ordinating body for Antarctic science, the aim of IASC was to try to come closer to being that body. There is an Arctic Science Summit Week that happens around Easter each year when all the working
British Antarctic Survey, Scott Polar Research Institute, and Scottish Association for Marine Science – Oral evidence (QQ 260 – 272)

groups of IASC come together. Efforts were made to try to get independent groupings like the Arctic Ocean Sciences Board to come in as a working group of IASC so there was genuine co-ordination at a high level. The marine group actually translated into an IASC working group and I think that that was a very good example of how co-ordination in the Arctic—

The Chairman: If I may interrupt you, Professor, we are approaching 11 o’clock, and perhaps we can prepare for when the Division Bells ring.

A two-minute silence followed.

The Chairman: Professor.

Professor Julian Dowdeswell: There are a number of groups that meet annually at the Arctic Science Summit Week, and then task subgroups of those groups meet more regularly. Indeed I think it is fair to say that a number of quite comprehensive reviews of different areas of Arctic science have been produced by the IASC working groups. There has been varying UK participation: the UK is active in the cryospheric group, in the terrestrial ecology group and in the marine group.

Lord Oxburgh: Do any of you know about the UK’s representation on working groups of the Arctic Council?

Professor Julian Dowdeswell: This is the Arctic Council?

Lord Oxburgh: Yes.

Dr Ray Leakey: Fairly sparse, I would say. Most of the Arctic Council working groups are led by Arctic nation states’ representatives. There has been some UK involvement, though, in contributing to reports which have been very comprehensive—certainly in the Conservation of Arctic Flora and Fauna group, also in the Protection of the Arctic Marine Environment and the Arctic Monitoring and Assessment programme. But it is very local.
Lord Hunt of Chesterton: Somebody came from your lab, did they not, to the recent Arctic Council group?

Dr Ray Leakey: That is right.

Viscount Hanworth: I would like to follow up on the melting of the ice caps. You appear to be reticent about attributing causality. Is this reticence somewhat influenced by political considerations? I have just been reading and juxtaposing two IPCC reports—one is the provisional one, the other is the final one—and I have noticed a considerable difference, which must have been influenced by politics. Can you comment on that?

Professor Julian Dowdeswell: Yes. I think it is clear that since 1980 the cocktail of greenhouse gases in the atmosphere has increased considerably. It is clear that the ice sheets in both the Arctic and part of Antarctica—though not in east Antarctica—are responding to this. The smaller ice caps in the mountain areas of the world and in the Canadian Arctic, Alaska and so on, are responding quite notably to this. I do not think there is any scientist who can say that it is 100% anthropogenically caused or 100% naturally caused, because both those things are going on together.

The Chairman: I do not want to go much further down this route because it is not the remit of this committee to decide why these things are happening.

Lord Hunt of Chesterton: You are talking about the strengths of UK Arctic science. One of the things we have been finding out is the amount of effort dealing with the permafrost, which is a huge aspect that has not had any international attention. I wonder whether you would like to comment on that. As I understand it, the Chairman has asked you to give him any supplementary evidence that you have, and if you have any evidence on that in your report it would be helpful.
Professor Julian Dowdeswell: Permafrost, permanently frozen soil with just a thin active layer in the summer, covers over 20 million square kilometres of the Arctic, and indeed below the water in the Arctic gas hydrates are a part of the permafrost story too. Quantitatively it is a very important part of the cryospheric system in the Arctic. It is an area of what we might loosely call a national skill shortage in the UK. It is being worked on by a few people but it has not received anything like the attention given to the glaciers and ice sheets. We can speculate as to why that may be. It may be because it is not part of the UK tradition. Much of that land is in what was the Soviet Union for many years and was therefore inaccessible to western scientists for a long period. North American scientists in Alaska have taken a keen interest in this from the point of view of how to get hydrocarbons out of Alaska. It has not been on the UK agenda as much as it might have been, although I agree with you completely that it is a very important issue.

Viscount Hanworth: It does seem to be a major lacuna in the international science—this absence of information and science about the methane danger. Would you agree?

Professor Jane Francis: I am not sure about that. I do think there is quite a lot of research on permafrost in the countries that experience permafrost, particularly from the practical standpoint of buildings collapsing. There are some projects in the NERC Arctic Research Programme that are addressing methane. There is a group looking at frozen methane on the sea floor and imaging it. It is showing bubbles rising from the sea floor off the west coast of Svalbard but at the moment that seems to be absorbed in the sea water. There are groups working on the tundra environments in several areas in the Arctic and measuring methane and carbon dioxide emissions from it as part of the Arctic Research Programme. There is also a project with the aircraft—the NERC research aircraft—that is monitoring methane coming from above the ocean in the Siberian area. So there is some research going on. There are a
couple of other groups that are monitoring methane in the UK. But it is a bit dispersed, again.

**Lord Hunt of Chesterton:** Do our scientists talk to the Russian scientists? It was a shocking business at this conference at the Royal Society in September—no Russians were invited. It was shocking and led to a frightful row. Is the NERC programme encouraging you to really make good, strong links with the Russians?

**Professor Julian Dowdeswell:** It has in the past been difficult to work with Russia. Just after the end of the Cold War there was a period when it was actually easier than it is now to get into Arctic archipelagos such as Franz Josef Land and Severnaya Zemlya. We did quite a lot of work with the Russians at that time; a number of UK institutions did. I suspect that that has rather tailed off. I should say, however, that there have been international cruises to Russian waters, to those very shallow shelves of east Siberia and the Laptev Sea, just this year, I think. I think that the Swedes were leading that but a lot of international scientists, including UK people, were on those ships, working together with Russians. So there are examples.

**Q265 Lord Hannay of Chiswick:** Could we look briefly at the EU dimension to research spending? The EU is, in fact, as I understand it, allocating resources to that. Do you believe that the British researchers are taking the best advantage of that? As you know, British universities score extremely highly in their uptake on EU research and programmes generally. On the Arctic ones, are we maximising what we could get from that? Secondly, do you think that if the EU were granted observer status, that would be likely to lead to an increase in EU allocations for research spending?

**Professor Jane Francis:** There have been some very large projects about the Arctic or about polar science that are funded by the EU. There is one called ice2sea, which is looking at melting glaciers and sea-level rise and is focused across both Poles, and another one called
ICE-ARC. There are several projects now that are funded by the EU. EU funding is very good for Arctic work because it allows multinational parties to work together on one project, and it provides quite a lot of funding. There are some big projects. At the current time, the funding in the EU, through the programme Horizon 2020, is not really focused on polar science, so it is hard work getting money out at the moment. We need some more influence in Brussels and in the Horizon 2020 programme to ensure that there is more polar science there in future.

**Lord Hannay of Chiswick:** Do you have any figures that you could provide us for the percentage that the UK is taking up on these EU projects, so that we could compare it with the percentage that we are taking up on other research programmes and projects to see whether our effort to use EU funds is lagging behind in the Arctic or is similar to that in other parts of the research framework programme?

**Professor Jane Francis:** I am sure that could be found. The Arctic Office in BAS will have information about the amount of funding that has been received for Arctic research, and it can probably compare it to the rest. But it depends on the focus of the programmes in the EU, and at the moment the Horizon 2020 programme does not have a strong polar component in it.

There is a body called the European Polar Board, which I am on, which brings together all the European countries to try to co-ordinate polar research, both Antarctic and Arctic. That is just changing its structure. But there is now an attempt to write a proposal for the European Polar Board to be recognised as the body that represents Arctic and Antarctic research. If that is funded, which I hope it will be very soon, it will provide some money for networking in the first instance to bring all the polar organisations in Europe together. From there we can build a much stronger European polar body to help to promote more funding.
Dr Ray Leakey: Just on the EU. There is the Northern Periphery Programme, which is now migrating into the Northern Periphery and Arctic Programme. There are territorial programmes within the EU that are also relevant at last slightly indirectly to the research that we do.

Q266 Lord Soley: I would like to pick up on a point that Lord Oxburgh raised a few moments ago about the role of the Arctic Council and its working groups. The first question is how well co-ordinated the research is that those working groups do. Following on from that, are there any areas that you would like to identify in which the UK is either doing well or could do better?

Professor Julian Dowdeswell: I think the Arctic Council has commissioned several reports on aspects of the Arctic environment over the past decade, sometimes through consultation with IASC, so I think there is linkage between IASC and the Arctic Council. The ACIA—the Arctic climate impact assessment—of 2004 although dated remains a classic contribution of that kind. That was stimulated by the Arctic Council, with help from IASC and other organisations. I think that efforts like that can lead to bringing in the science community, whether it is just for the cryosphere or for Arctic change more broadly, and that has been quite a successful formula a number of times. In a way, it is looking to play the same sort of role that the Scientific Committee on Antarctic Research plays. That is to say that IASC can provide all the science information that can inform the Arctic Council and the Arctic Council working groups.

Lord Soley: So you are saying in effect that they co-ordinate it quite well, although they might not actually initiate it, if you like.

Professor Julian Dowdeswell: I think that on occasion it has worked very well.
Lord Soley: On occasion. Okay. You do not want to elaborate on the occasions when maybe they could do better?

Professor Julian Dowdeswell: No. I am afraid that I do not know enough about it.

Lord Soley: Can I ask you then what role Britain could play that she has not already played?

Professor Julian Dowdeswell: One of the things about the Arctic Council is that it is driven by the member states, and that is quite proper and very clearly the intention. The UK, as you quite rightly say, is an observer and so has relatively limited input. We have quite strong input where science programmes are proposed. We can then put forward the names of key scientists to take part. What I hope we have shown already is that UK polar science and Arctic science is very strong on a world scale, so we have to have world-class scientists to input into these things. That is a key role.

Lord Soley: Given the number of states seeking to be observer states—China and South Korea spring to mind as ones with a good scientific input—is it right that we look at ways in which observer states can improve their scientific contribution, bearing in mind that there will be other observer states, not just the UK?

Professor Julian Dowdeswell: One assumes that the more there are the more difficult it is for any one to be heard.

Lord Soley: And therefore co-ordination is going to be a problem.

Professor Julian Dowdeswell: I would have thought so. I am not familiar enough with it to comment on that.

Q267 Lord Tugendhat: What use does the Foreign Office make of UK research on the Arctic? How does UK science inform the Foreign Office position in Arctic discussions? You have talked about the fact that as an observer we are marginal in some respects, but does it in fact help to support UK business and commercial interests in the Arctic?
Professor Jane Francis: Certainly the Foreign and Commonwealth Office welcomes the presence of British scientists in the Arctic. One way in which there is a UK presence is through its scientists being there. As you know the Foreign and Commonwealth Office recently produced the UK Arctic strategy, which encourages science in the Arctic. There is no funding, of course, from the Foreign and Commonwealth Office for work in the Arctic, but it certainly encourages support as much as possible. The Foreign and Commonwealth Office has, for example, helped us with memoranda of understanding with Arctic countries such as Canada and Norway so that we can work with them and collaborate, which has been extremely helpful.

Dr Ray Leakey: A number of years ago we did a commission for the FCO looking at stakeholder engagement. One of the things that came out of that was that although we have a strong Arctic fundamental research base which it can draw upon, when it came to more applied areas of science—fisheries, transport, energy—we did not have as much Arctic expertise as we might wish for, or at least which the Foreign and Commonwealth Office might wish to draw upon. That is not to say that expertise in those areas does not exist. It does exist in other remits, but not particularly in the Arctic, so there is perhaps an opportunity to expand our Arctic expertise in applied areas that may be more useful to industry by drawing upon that expertise in other aspects of the UK research base.

Lord Hunt of Chesterton: Would it not have been a good idea if the Foreign Office thought about data sometimes, because they could make a big difference?

Professor Jane Francis: Scientifically, there is a data gap in Arctic science. There is quite a lot of work on the land areas, the terrestrial areas, but there are publications that show that very few data are being gathered around the shelf and around the centre of the Arctic. So when you see pictures of the earth showing the red areas in the polar-regions that are
warming up, a lot of that has been generated. They are not computer models, they are actual data, but they have been generated by mathematics and by extending atmospheric formulae into the Arctic. In fact, what we really, really need is far more observational data from the Arctic. I keep talking about this but I think it is absolutely critical. There is very good science. There is a collaboration called INTERACT, which is a catalogue, if you like, of all the research stations across the Arctic belonging to each nation. It is a big book, and scientists can go through it and ask to work in any of the bases. But there tends to be data collection in very specific places. Lots of different types of data are collected in one particular place, and there are huge gaps, in particular, of course, in the Russian area because it is such a vast area. Collecting more observational data from the Arctic is really key for us to look at in the future.

Professor Julian Dowdeswell: Data collection is one part of it, but actually putting the data together is another. There are a lot of data in Russia which are held by Russian scientists but are not available to us, not necessarily for security reasons but for all sorts of reasons.

Lord Hunt of Chesterton: A lot of data were published in Russia, but our scientists do not know Russian and do not get the data.

Professor Julian Dowdeswell: We have a Russian cataloguer in the Scott Polar Research Institute who goes through a lot of this material, but there is a huge amount of it and we are but a small institution. But we explicitly recognise that as a problem, and one of the best repositories for permafrost literature outside Russia is the UK through our translation facility.

The Chairman: I think Dr Leakey wanted to come in.

Dr Ray Leakey: On the subject of data, it is not just about data collection in our present situation. One of the major problems in the Arctic is that we do not have a good historical
British Antarctic Survey, Scott Polar Research Institute, and Scottish Association for Marine Science – Oral evidence (QQ 260 – 272)

record and a good baseline to draw upon of what was happening in the past. There is a paleo record, there are some historical records, but we do not have that long historical data set from which to draw. That presents problems in trying to state what a normal steady-state Arctic, if there is such a thing, would be by which to compare changes. The lack of a baseline in historical data is a real problem. That makes the current monitoring programmes even more urgent, which have to be more highly resolved temporally and spatially.

The Chairman: Professor Francis, I think you wanted to come in on that point very briefly.

Professor Jane Francis: It is not just about collecting data once; it is about long-term monitoring, which we really need in the Arctic. We know that the changes that are going on now are variable, but what is the long-term state? That is what we are missing. That is the gap: the long-term monitoring of Arctic change.

Lord Oxburgh: What we are talking about is survey science rather than project-driven science. At the moment, almost all science that is done in the Arctic is project-driven rather than the systematic collection of data. Thank you, I just wanted to be clear.

Q268 Viscount Hanworth: Are the Arctic ice-core data at all comparable to the Antarctic data, which of course have been acquired by various parties, including the Russians? What is their quality, and are they accessible data?

Professor Julian Dowdeswell: The Arctic ice-core data from Greenland are of very high quality. In fact, arguably they are at better resolution than the Antarctic data because the accumulation rate is higher and therefore you get a higher resolution to the record and in some cases you can count back almost annually for thousands of years of Arctic change. This is probably the single most key baseline data set for Arctic environmental change over the last 1,000 to 100,000 or so years, but the record is shorter because the accumulation rate is higher.
The Chairman: There is one other thing that I want to come back to on Lord Tugendhat’s original question. Is there any UK body with a role like that of the Norwegian Polar Institute which specifically advises the FCO? Is there anything in the UK that works in that way?

Professor Jane Francis: The British Antarctic Survey is now extending its remit. It has worked in the Arctic for some years now, but now we are officially broadening out and extending our work into the Arctic. We have had British Antarctic scientists working in the Arctic for many years. We do not as yet have an Arctic strategy, but we are developing one. We are not particularly funded for scientific work in the Arctic specifically, so we have to do that on grants.

The Chairman: That is fine. That answers the question very well.

Professor Julian Dowdeswell: One of the intentions of the newly formed UK Arctic and Antarctic partnership, which involves scientists in both government research laboratories and the HEI sector in Britain, is to provide a focus for the information that we have from various disparate although very strong scientific grants that are being worked on at the moment. The idea is that that will, we hope, develop into an institution where the FCO has a point of contact that it can come to and say, “Right. Who are the experts in this particular area?”.

The Chairman: Do you think that FCO is interested in having that?

Professor Julian Dowdeswell: Oh yes, I am sure it is.

The Chairman: Okay. What about the Ministry of Defence? Does it show any interest?

Professor Jane Francis: Not in the Arctic, as far as I am aware, at the moment.

Professor Julian Dowdeswell: The MoD obviously has Arctic operations involving both submarines and military on the ground, and it is interested in the Arctic as an arena and how it is changing and so on. That is important. An example is the MoD’s support for the Polar
Library of the Scott Polar Research Institute to some degree, precisely because it sees the information on both the Arctic and the Antarctic as being important.

**Lord Hunt of Chesterton:** And a lot of people in the MoD speak Russian.

**Professor Julian Dowdeswell:** Yes.

**Q269 Lord Addington:** This is a more general point. How important is British Arctic science to maintaining the UK’s influence in the Arctic, and to what extent is it important to at least keep up with the other observer states, particularly those who have a good scientific base and some sort of history of Arctic science or Antarctic science?

**Professor Julian Dowdeswell:** I think it is really important. It is one of the principal ways in which we can recognise that Britain makes a strong contribution to what is going on in the Arctic at the moment. Although we have said that there are many different groups and that they are not as easily recognisable as our Antarctic work, throughout the science community and more widely in relation to the Arctic Council it is the UK science presence, including the British base in Spitzbergen, that is one of the important things there.

**Professor Jane Francis:** I think that we also need to look at it in terms of the science. The Arctic is changing, not because of what is happening in the Arctic but because of what is happening globally. The changing Arctic is also affecting the rest of the globe, and it is particularly affecting the UK. Our strange weather at the moment looks as though it is being affected by what is going on in the Arctic. So we absolutely cannot ignore that area. It is a fundamental part of our whole Earth system. If we do not work on understanding change in the Arctic, we cannot answer some of the questions about how it is going to impact on the globe and on the UK. So it is absolutely vital that we send our experts into the Arctic. It would be a disaster to retreat from that area.
British Antarctic Survey, Scott Polar Research Institute, and Scottish Association for Marine Science – Oral evidence (QQ 260 – 272)

Lord Addington: So effectively we cannot just say that it is the Arctic. The Arctic is a good place for studying exactly what is going to happen to us in five winters’ time. It is that straightforward.

Professor Jane Francis: Yes. It is a fundamental part of the whole Earth system. If we do not study that, we will not be able to understand how the Earth system operates. You can see how in the last year or so scientists have come to believe that some of the things that are happening in the Arctic, with the warming of the Arctic, are changing our UK weather. In some conversations with scientists who are about to produce papers, they have said that some of the weather systems that we have had more recently—where pressure systems have stalled over the UK so that we have had continuous rain and continuous drought—are due to the warming in the Arctic. It is absolutely critical that we understand what is going on in the Arctic in order to understand what is happening in the UK.

Lord Addington: So it is not just a question of prestige; you are saying that it is more fundamental than prestige. You are saying that planning has a direct effect.

Professor Julian Dowdeswell: The answer is that it is the most sensitive part of the global climate system and it is changing more rapidly than any other part of the globe at the moment. Given what Professor Francis has said about the linkages, it must be very important to us for that reason.

Dr Ray Leakey: And we can learn from that in terms of other areas that are going to change. Certainly in the biological round, how organisms adapt in the Arctic in a very short timescale can give us an insight into how changes in other areas of the planet may occur.

Lord Soley: My understanding, Professor Francis, is that you have done a lot of work on the history of the Earth in terms of changes in climate. When you talk about this additional research that we need in the Arctic, I gather that history suggests that there might have
been very dramatic weather changes in the North Atlantic. Are you able to say any more about the work that you do there, and is it sufficient or do we need to do more?

The Chairman: We are going to come on to the question of the gaps when we come to Question 7, Lord Soley.

Professor Jane Francis: I would like to say one more word about the influences. For example, when we were both at the Arctic Circle meeting in Reykjavic recently, one of the things that came up was that deep-water fish are moving north. Fisheries around the UK are being affected by that, so there is quite a lot of commercial interest as well in the Arctic.

The Chairman: We are going to come on to fisheries right now, I think.

Q270 Viscount Hanworth: My question is primarily for Dr Leakey. What are the main gaps in our understanding of the Arctic marine ecosystems? How much do we know about what is happening under the polar ice cap? Do we understand how the distribution and the relative abundance of marine species are changing? Finally, does the UK have a role in increasing our understanding of these matters?

Dr Ray Leakey: The UK certainly does have a role. In my view, marine ecosystems are important from three perspectives. First, they are important for essentially pumping carbon down to the sea beds. There is a carbon cycling role that marine ecosystems play a role in. There is also the issue of marine productivity and fisheries, which is important. And then there is also the issue of charismatic species, biodiversity and conservation, including migrant species that come to the UK. So it is clearly an important area.

In terms of the major gaps, I think they are both quantitative and qualitative. With regard to the quantitative aspect, we really do need better spatial and temporal resolution data. We also need to be able to look back into the past to try to get a more constrained baseline as to how marine ecosystems should behave and what their natural variability is. There is also the
qualitative question as to how organisms will respond to change—their resilience and their resistance. So there are two different tiers to this.

In terms of filling those gaps, the quantitative side is going out and monitoring, doing paleo studies on what past ecosystem structures were like, and essentially using that information to help validate and test predictive models.

The qualitative aspect is important. There is a lot about the functionality of organisms in the Arctic that we do not understand. If we do not understand those processes, it is very hard to embed them into models and to have the models respond accordingly in terms of predicting how ecosystems will change.

I would say that in general the prognosis at the moment is that the Arctic is a bottom-up system. It is driven by a lack of light and nutrients. As you remove the ice, you allow more light in and you will get more plant growth. That plant growth will feed up through to a more productive ecosystem. That is a general prognosis. There are some factors that operate against that and which may drive it somewhat in the opposite direction.

However, a further complication is how the ecosystem will respond in terms of the composition of the organisms. You may have a more productive ecosystem but you may not have one that looks as Arctic—one that has the same sort of components. That may present a problem, particularly for highly adapted Arctic species, which tend to rely on productivity associated with sea ice and with energy which is efficiently transferred up into larger organisms. So we may lose the character of the ecosystem if it changes, even if it becomes more productive.

Viscount Hanworth: So there is a lot more to be discovered. Specifically with regard to what is happening under the polar ice cap, are we making inroads into that absence of knowledge?
Dr Ray Leakey: The central Arctic is a big knowledge gap. Some expeditions have been through there but they are few and far between. So we know something about the biodiversity and productivity there but certainly much less than we know about the more marginal seas.

In terms of the importance of that central Arctic area, it will potentially become more important if the ice edge moves north. If that lid of ice is removed from the central Arctic, we can envisage that area becoming potentially more productive and certainly more attractive in terms of fisheries in the longer term. But there is a lot that we do not understand about that part of the Arctic.

Viscount Hanworth: Is there anything that we could do to encourage the acquisition of knowledge in that area?

Dr Ray Leakey: We have a new polar research vessel, which may be able to access that area more easily. I think that there is some interest within the UK biodiversity community in terms of going into that area. Britain is particularly strong on ecology and biodiversity research, so I think that a lot of the knowledge that we have in the UK can be applied there, whether it is basic taxonomic skills to identify the organisms that are present or whether it is aspects of ecological theory to understand how the ecosystems in the central Arctic operate.

Viscount Hanworth: Thank you. That has been very informative.

Lord Hunt of Chesterton: The fact is that there has been a huge experiment in terms of fisheries in Iceland because of the cod wars and the restrictions relating to them. Is there something that we can learn from the history of the last 40 or 50 years in moving forward to having marine protected areas? Obviously one of the big questions concerns fishing fleets going north to move into these fishing areas. Can we give very solid advice to the Foreign Office and others as to how we should be developing policy?
British Antarctic Survey, Scott Polar Research Institute, and Scottish Association for Marine Science – Oral evidence (QQ 260 – 272)

**Dr Ray Leakey:** Fish stocks do not necessarily respect boundaries. They will go where they wish to go, and the warming Arctic will change the patterns of those fish migrations. I would say that when it comes to trying to protect fish stocks, it has to be a more international approach where we work with different nations, particularly where fish stocks move from one area to another.

**Lord Hunt of Chesterton:** But have we learnt something from the past?

**Dr Ray Leakey:** Fisheries are not my particular area of expertise. I would say that following a scientific approach to fisheries management is really important, as is being more cautious in our approach to taking fish stocks. Having a more sustainable approach would certainly be the way forward.

**The Chairman:** Could you respond very briefly, Professor Francis, because we are running out of time now?

**Professor Jane Francis:** The British Antarctic Survey has specialists who work on the conservation of fisheries and on fish stocks in the Southern Ocean. I think that those techniques and that expertise could be applied to the north.

**Lord Hunt of Chesterton:** Will they be applied? This requires some organisational change, does it not?

**Professor Jane Francis:** Yes, with support from the Foreign and Commonwealth Office.

**Q272 Lord Hannay of Chiswick:** Could we look at this issue of gaps—future as well as current ones? In what direction do you think international research should be moving in terms of priorities for the future in the Arctic? I think that we have gone over some of the permafrost and fisheries gap issues. Therefore, perhaps as ancillary to that, what should the priorities be for the UK’s Arctic science in the period ahead?
The Chairman: Perhaps in the remaining time I could ask each of you to give your bullet point opinions on what you see each of those priorities being. Perhaps Professor Dowdeswell would answer first.

Professor Julian Dowdeswell: I think that we should continue our measurement and our modelling of the cryosphere of the sea ice, the glaciers and the ice sheets. The UK is a world leader in this and that work should be continued. I think that we could move much more into the areas of permafrost and methane. Also, it is very important to get at data that already exist and utilise those data, particularly from the Russian Arctic sector, which is huge. There are also some areas—for example, the sea floor in the Arctic Ocean and indeed the seas further south within the Arctic Circle—that are simply not mapped yet. We do not know what their shape is. We know the shape of the moon better than this. That is also a priority area.

Professor Jane Francis: Long-term monitoring is absolutely critical so that we understand variability in the Arctic Ocean. In future, we can do that more efficiently with autonomous vehicles and a lot more technological innovation in the Arctic so that we do not have to have expensive expeditions there, although we still need to have those. There is a huge opportunity in the Arctic for science and industry to work together. Industry could help us to do some of that monitoring and data collection.

Dr Ray Leakey: The monitoring side and the observational data are certainly really important. In terms of Britain’s contribution, we need to play to our strengths in the areas where we already do very well and where we can add value to the international effort. I am talking about the areas which are feasible for us to work in, where we have the platforms to be able to contribute to that international effort.
Lord Soley: I was struggling to remember the word paleoclimatology, which I think is your area. I wonder whether we should do more there in order to put what we have done in geological time, which is relatively short term, into a longer-term context. Is that right or not?

Professor Jane Francis: We are at 400 parts per million CO$_2$ at the moment. The last time the Earth was in a state where it had 400 parts per million CO$_2$ was about 3 million to 5 million years ago in a geological period called the Pliocene. If we go back and study rock records from that era—we have good records, particularly from Antarctica and also from the Arctic—we can try to work out what the Arctic, the Antarctic and the world will be like in that high CO$_2$ world. It is one of melting ice sheets, I can tell you.

Lord Soley: So we should do more on that.

Professor Jane Francis: Absolutely. Looking backwards in time would help to give us a picture of where we are going.

The Chairman: Professor Dowdeswell, Professor Francis and Dr Leakey, thank you very much for an excellent session of evidence, which I think the Committee will find extremely useful. Thank you very much indeed.

While we change over, I remind colleagues that we are still being broadcast.
Background to the evidence

1. Credibility

My evidence is based on 47 years of research and research leadership in every Arctic country. I hold concurrent Professorships in Sheffield (Professor of Arctic Ecology) and Russia (Professor of Botany) and I am a Distinguished Professor of the Royal Swedish Academy of Sciences. I hold honorary doctorates from 3 of the 8 Arctic Countries, part of the group award of the Nobel Peace Prize to IPCC and medals from H.M. the King of Sweden and H.M. Queen of England (Polar Medal Arctic). I have published over 420 scientific papers and I am classified as one of the world’s “most cited and influential researchers”. My main current task is to coordinate INTERACT, a network of over 70 Arctic and northern research stations based in every northern country (www.eu-interact.org). This year, the stations in the network have hosted over 5,100 researchers spending over 410 person years in the Arctic and 76 individual environmental networks. INTERACT has given grants to many UK researchers to visit Arctic research stations. INTERACT is happy to facilitate this enquiry and has the capability of fact-finding throughout the Arctic.

2. Basis for the Evidence

My work encompasses thousands of printed pages. It includes highly detailed research papers on specific aspects of climate change and its impacts in the Arctic, synthesis papers of multiple changes in specific regions of the Arctic and large-scale international assessments e.g. changes in ecology (Arctic Climate Impact Assessment, 2004), changes in snow, permafrost, ecology and feedbacks to climate (Snow Water Ice and Permafrost in the Arctic, 2011), and IPCC Polar and Ecology chapters 2007 etc. The syntheses and assessments have involved numerous co-authors from many countries but I have led many of them. In 2013, I summarised the local and global changes and their implications in a very short paper presented at a Royal Colloquium arranged by H.M. the King of Sweden. This succinct paper is attached [not reproduced] but I have not appended the detailed papers and assessments which this is based on. However, all this material is readily available if required. Below, I use my experience and my published work to specifically focus on those questions posed by the Select Committee on the Arctic. I have not used referencing of each statement but the major sources can be found in the attached paper [not reproduced] while other sources can be provided if required.

Evidence

Summary

The observations show that the Arctic’s climate is warming twice as fast as the global average and that this rate of change will lead in 100 years’ time to mean annual temperatures approximately 3 to 6°C higher than those today. The temperatures between 2005 and 2010 have been the highest on record. Such dramatic climate changes are likely to be associated with profound changes in permafrost, the duration of snow cover and snow
melt in winter. Changes in ecosystems are more variable: vegetation productivity has increased over only 37% of the Arctic’s surface and although trees and shrubs are expanding in some areas, disturbance events such as warm events in winter when snow thaws, forest, tundra and peatland fires, forest insect pest outbreaks and flooding have moderated or even over-turned expected vegetation responses. However, possibilities for agriculture and forestry, availability of water resources and possibilities for human settlement are likely to increases in the future.

At a global scale, including the UK, changes in the Arctic’s landscape are expected to accelerate subsequent warming through a range of feedback mechanisms and increase sea levels.

At local scales, ecosystem services for local peoples will change as traditional food sources dwindle and well-being and livelihoods will be challenged as an inability to read weather affects transport and everyday life. There will be economic and commercial opportunities resulting from increased access to resources but the risk of severe environmental damage is great.

The UK is playing an important role in the Arctic and can continue to develop and apply its science to forewarn Arctic and Global communities of impending change. A specific example is offered in which a network of over 70 research hosting thousands of researchers each year could be used to develop a rapid response capability for environmental hazards throughout the North.

Questions

What are the main issues arising from recent and expected changes in the Arctic, and how will these impact on the Arctic and on the UK?

This is a huge topic and I would refer to the following published papers for detail.

Climate. The Arctic’s climate is warming twice as fast as the global average and this rate of change will lead in 100 years’ time to mean annual temperatures approximately 3 to 6°C higher than those today. Winter is warming faster than summer. In sub-Arctic Sweden where records exist for 100 years, temperatures are now significantly higher that the early warm period of the 20th Century and are probably the highest in the past 2000 years or more.


Permafrost in the Arctic is warming almost everywhere and in some areas permafrost has disappeared. Loss of permafrost and thawing permafrost have local impacts in disrupting buildings, pipelines and transport routes and changing hydrology: ponds are formed in some areas and lost in others. Thawing permafrost also has a global impact – including on the UK – in that carbon stored over thousands of years can be released into the atmosphere accelerating climate warming.


Snow cover duration reached a record low in 2012 throughout the Arctic. Spring has advanced by about two weeks in the past 3 decades. Changing snow conditions affect local communities (e.g. transport, flooding at melt, hygiene etc) and global communities. The latter is affected because a positive feedback to the climate system seems to be operating: warming leads to earlier snow melt, earlier snow melt allows more solar energy to be absorbed by the ground that would have otherwise been reflected back to space, a warmer ground results in even earlier snow melt etc. This positive feedback from albedo changes could affect the climate in general. Extreme events in winter are increasing. These include rain on snow events and periods of winter warming which melt the snow pack which refreezes. These events prevent animals from reaching their food or escaping predators. Millions of wild reindeer have died in the past 3 decades and lemming cycles have decreased in many places. Other aspects of biodiversity have also changed.

Ecosystems. While changes in the cryosphere (snow, ice, glaciers, Greenland Ice Sheet, permafrost) are dramatic, changes in ecosystems are very variable. Only 37% of the Arctic vegetation has significantly increased in growth over the past 3 decades. Trees and shrubs are moving northwards, but not everywhere. The general increases in summer temperature that stimulate plant growth are being offset in many areas by extreme events – tundra fires, insect pest outbreaks and the winter warming events described above. The increased drawdown of atmospheric carbon dioxide suggested by some models (which would lead to general climate cooling) cannot therefore be anticipated and models need to be refined to include the events. While winter warming is killing many populations of animals, animals adapted to the Arctic such as Arctic fox are declining as competitors move northwards from the South. Despite the complexity of ecological response to warming, it is likely that in the long-term (50+ year), the Arctic will support more forestry and agriculture but with the potential loss of some iconic Arctic animal species and a reduction in current sup-abundant plant species.


Will changes in the Arctic lead to new economic and commercial opportunities?
This is not my area of expertise but published work and experience suggests that access to oil, gas, minerals (including uranium and iron ore in Greenland) will become easier. New transport routes for shipping (northern Sea Route and North West Passage) will generate economic advantages for transnational industries and the southern regions of northern countries such as Russia could benefit from new railroads and infrastructure connecting the coastline with centres of population to the South. Experience of developments of coastal oil reserves in northern Norway suggests a drain of skilled labour from adjacent regions and logistical problems away from the area of development. A “long-shot” is the commercial development of methane hydrates on the Arctic’s coast shelves, such as in the Laptev and New Siberian Seas. Such development would provide a long-term energy source while reducing the global risk of methane emissions from the shelves to the atmosphere – a 1% release would double atmospheric concentrations of carbon.

In the longer term future, improved forestry and agriculture and perhaps exportable renewable energy are likely to generate economic opportunities although there will be new requirements for innovations in mitigating against fire, pest and parasite outbreaks.

How should economic development be balanced with environmental protection in the Arctic?
What should the UK’s role be?
This is not my area of expertise. However, as an ecologist, I know that many ecosystems – marine and terrestrial – are very sensitive to disturbance. Many plants and animals grow very slowly in the short Arctic summers and therefore live for many years to compensate. This is necessary for reproduction. For example, some caterpillars may take 14 years to become a moth; cushions of flowering plants may live for hundreds of years and at least one clonal sedge has survived in one location for 6,000 years. Clearly, any disturbance such as an oil spill will either persist for generations or it will open up niches for invading southern species to occupy. At the same time, disturbance of vegetation on areas of permafrost often leads to a feedback process in which vegetation that cools the soils surface, once disturbed, leaves a black surface that absorbs solar radiation and this then thaws surface permafrost and a pond is formed. There are many examples of this “thermokarst” effect in the Arctic resulting from driving on the tundra. At sea, an oil spill will take many generations to repair and there is still no technical method to “clean-up”.

The UK can contribute a process-based understanding of disturbance impacts on Arctic ecosystems. Perhaps it can contribute to developing remedial measures and it should insist on environmentally friendly development when it has the opportunity to do this. Regulating insurance companies such as Lloyds and UK based industries by offering insurance and support only when credible, sound environmental impact assessments have been mad.

What is the potential impact of the changes for local populations?
Changes in climate interact with globalisation to provide more challenges than opportunities to local communities. Their contributions to global emissions of greenhouse gases are minimal and their populations are too small to provide meaningful mitigation. The local
communities must therefore adapt to change caused by nations elsewhere. As the changes are extremely variable, particularly changes in ecosystem services (traditional food and fuel etc), adaptation is a very local issue and generalisation is impossible. For example, adaptation to changes faced by Greenlanders who depend on marine resources (seals, fish, whales, shell fish) and who need specific ice and weather conditions for hunting and travelling is very different from Sami and Nenet reindeer herders who are losing their summer mountain and tundra grazing lands to tree and shrub encroachment. Unfortunately, science focuses on generalisations and up-scaling and there is currently a miss-match between scientific requirements by local populations and the appropriateness of science output. Examples are models of future climate at small enough spatial scales to be relevant to local inhabitants, road and rail administrations etc.

Scientific activities also currently fail to model future environmental change at time scales appropriate to local communities. Extreme events (tundra and forest fire, winter snow thaw and rain on snow events, spread of invasive species and pathogens etc) occur as “surprises” and cannot be predicted. However, they can often over-turn long-term trends. For example a tundra fire on the North Slope of Alaska in 2007 released in a few weeks carbon that had been captured and stored “safely” in soils for 50 years. Similarly, advancing treeline over past decades are decimated in some places by insect pest outbreaks. Also, pathogen-carrying ticks are a new threat to reindeer.

Although local peoples will experience new commercial developments on their doorsteps as access to resources and new transport routes increase, experience shows that there is little financial benefit as skilled labour forces are brought in from outside. Such developments adversely affect the local culture while new issues of land ownership – for example – in Greenland – are likely to arise. If we speculate into the far distant future (50 year +), it is likely that many Arctic areas such as Siberia will have more benign climates, increased possibilities for agriculture and forestry and plentiful non-renewable and renewable resources, particularly water. Local communities and cultures are likely to be threatened by huge (10s of millions) human migrations from areas suffering from desertification and sea level rise. The ultimate scenario is one of possible conflict or land annexation. Already, over 200,000 Chinese residents have moved into Siberia, but peacefully.

Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

I am not an expert on governance or security but I will address a few specific issues. Dealing with anticipated challenges. The UK has an extremely strong science base. It is already making major contributions to understanding changes in the cryosphere and biosphere. These are important at multiple scales: at the local scale, work on ecosystem services and biodiversity can potentially improve the well-being of local communities while modelling of landscape processes such as vegetation, snow and permafrost thaw and its implications for water resources will forewarn local inhabitants of likely future challenges. At the same time, the UK is strong in research on physical (energy exchange), biological (greenhouse gas emissions) and cryospheric (glacier decline) processes that lead to globally important issues such as sea level rise and amplified warming. This UK research base could be strengthened but should be encouraged to develop some activities more relevant to local communities (e.g. downscaled models and inclusion of environmental events and hazards) and partnerships with international groups should be encouraged or be even mandatory –
the size of the challenges are too great for any one nation to solve. INTERACT is happy to facilitate work throughout northern landscapes. The UK could also play an important role in the development of an early warning system and rapid response to potentially hazardous events in the Arctic. For the first time, INTERACT offers a geographically comprehensive coverage of the whole Arctic: one e-mail or one phone call can activate over 70 research stations to make observations or collect samples should there be an alert such as release of radionuclides, spread of pathogens, contamination of snow by black carbon, spread of invasive species, emissions of volcanic ash etc. Such warning of hazards is extremely important to local communities and the Northern Hemisphere. INTERACT is proposing the development of an early warning system to the EU and the Global Observing System GEO. However, although INTERAVCT can observe in the field and collect and ship samples, analytical laboratories and emergency date-handling systems are required: the UK could make a major contribution here.

Stewardship of the Arctic environment. As the UK does not own Arctic territory, it can only advise. However, by modelling future changes in Arctic landscapes and ecosystems, it can direct attention to urgent needs for conservation and design co-management systems where stakeholders with different interests (e.g. the forest and reindeer husbandry enterprises) compromise and work together. A general need is for innovative conservation management to be developed. So far, the Arctic is rich in protected areas because of relatively little commercial value in Arctic lands. However, future ease of access might challenge the protected status of some of these areas as seen in the Alaska Wildlife Refuge issue. As the UK has no land rights, it could play a role as “honest broker”. Furthermore, protected areas only protect against direct human exploitation – not climate change. Innovations of conservation management are urgently needed.

Tourism. Substantial increases in cruise tourism and tourism in general have occurred and are expected to continue. These increases require stronger regulations for direct (e.g. trampling) impacts on sensitive northern ecosystems and on the tourist industry per se. Currently, the rescue capability in the Arctic is insufficient for the size of cruise ships and there is no law that they should sail the Arctic in pairs (only a cruise ship can save the passengers on a cruise ship in distress).

How effectively does the UK interact with Arctic governance structures? Is the UK Government’s approach the right one?

Although this is not my field, there is an attitude I am aware of in international political circles that the UK could and should be more active in Arctic issues. My humble advice would for the UK’s contribution to Governance be in partnership and active but not dominant.

September 2014
Professor Alex Calvo – Written evidence (ARC0007)

1. What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?

The opening of the Northern Sea Route is bringing the UK and Japan closer, at a time when bilateral security and defence relations are gaining traction, with a number of agreements having been signed in recent years. Arctic navigation adds another dimension to Anglo-Japanese relations, with the two countries sharing an interest in the Northern Sea Route’s availability, safety, and security. It may be advisable to bear this in mind and ensure, among others, a continued exchange of views and information, joint Royal Navy – MSDF (Maritime Self-Defense Forces) / Japanese Coast Guard drills, and the presence of an Arctic expert at the British Embassy in Tokyo.

2. Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities, and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?

The UK Government must ensure that the Armed Forces retain and develop the means and expertise to operate in Arctic and near-Arctic environments. This is an essential foundation of economic diplomacy, since only countries with those capabilities are likely to become serious players in the region. Given some geographical similarities with the Falklands, South Georgia, and the British Antarctic Territory, the development of these capabilities also has a positive impact on deterrence in the South Atlantic.

3. How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?

The Falklands Islands have been moving cautiously yet decisively in recent years to ensure that economic development, in particular oil exploration and production together with tourism, is sustainable, safe, and compatible with the highest standards of environmental protection. It may be advisable for the UK Government, in conjunction with the Falkland Islands Government, to highlight these policies and ensure that they are widely known in the Arctic region. In addition to amounting to a significant contribution to the economic development and environmental protection of the Arctic, this would serve the purpose of boosting British and Falklands soft power. The contrast with revisionist powers in the South Atlantic with a rather poor economic and environmental record would clearly illustrate the practical advantages of traditional British values and liberties.

7. Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

By Alex Calvo, guest professor at the Law Department of Nagoya University (Japan), acting in his personal capacity.
The UK should retain and increase existing levels of military cooperation and joint training with Canada and Norway. These should be expanded to include Japan.

August 2014
The Canadian Polar Commission monitors and reports on the state of knowledge of the Polar Regions and works with Canadian and international institutions to determine scientific and other priorities and encourage and facilitate collaboration (please see www.polarcom.gc.ca for more information). In 2014, the Commission published a Report on the *State of Northern Knowledge in Canada* which analyses significant research gains made since the beginning of International Polar Year in 2007 with a view to determining today’s high-level research opportunities and assisting decision-makers in identifying and acting on key knowledge gaps most critical to Northerners and the Canadian North. The report is built on semi-structured interviews with 114 northern researchers and practitioners, two-thirds of them resident in Canada’s North. Interview input was corroborated through an extensive survey of peer-reviewed and grey literature and reinforced by further expert consultation. Responses to the questions from this call for evidence are based on the findings of this report. The full report including references is available on the Canadian Polar Commission’s website: http://www.polarcom.gc.ca/eng/content/download-northern-knowledge-report.

1) *What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?*

Based on the findings of the Commission’s *State of Northern Knowledge in Canada* report, some of the main issues and associated impacts arising from recent and expected social, economic, cultural, and environmental changes in the Arctic region include the following:

- **Preparing for large-scale resource development** – how to ensure sustainable development and management with meaningful benefits for Northerners; and minimize negative environmental, socio-economic and cultural impacts;
- **Increasing community sustainability** – how to address the high cost of living and doing business in the North; support local and regional economies; understand and adapt to climate change implications for transportation systems and infrastructure including housing; improve the reliability and use of renewable and alternative energy to facilitate a transition away from non-renewable fossil fuels; increase food security including access, availability, and quality; and improve health care systems;
- **Strengthening resilience** – how to address social determinants of health to improve mental and physical health and well-being; improve educational success and attainment; and ensure continued transmission and application of traditional knowledge and practices; and,
- **Understanding environmental change** – how to better understand, predict and respond to environmental change resulting from natural and anthropogenic factors through research and monitoring.

The UK has many human, environmental and commercial interests in the Arctic, especially given its close proximity to the Arctic Ocean, as outlined in *Adapting to Change: UK Policy Towards the Arctic*. Changes in the Arctic will have a significant impact on each of these areas of UK interest. For example, with reduced sea ice there is the potential for increased marine traffic from shipping, tourism, and resource development activities. There are,
however, implications for human safety, for example, given insufficient and dated charting/hydrographic data to support safe navigation. While there is the potential for increased access to oil and gas reserves, there are numerous challenges to address to facilitate sustainable development and management.

2) **Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities, and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?**

While some changes in the Arctic are leading to new economic and commercial opportunities, other changes have the potential to do so. Opportunities include the potential for increased shipping, greater access to oil and gas reserves, increased land and cruise-based Arctic tourism, and new commercial fisheries. There are, however, many barriers that can impede the extent to which these economic and commercial opportunities can be realized.

It can be challenging to operate in the sensitive, remote and cold environment of the Arctic. As well, in many regions of Canada’s North, existing infrastructure including community infrastructure, transportation systems and communications infrastructure is underdeveloped, aging, and in need of significant repair and/or upgrades to support current and future use, especially in terms of attracting and sustaining resource development activities. Further science and technology is, therefore, needed to inform the sustainable development and management of economic and commercial opportunities, and to identify, test and adapt associated technologies that are affordable and suitable for northern conditions. Given the strength of the UK research and technology development community, this is an area in which the UK can make a substantial contribution.

It is important that research pertaining to Canada’s North involve Northerners, including community-based groups and organizations, in decision-making at all levels. This involvement is needed to ensure that the research undertaken addresses areas of priority and that new knowledge is translated readily into improved policies, programs, interventions and services that are appropriate in the local, northern context.

3) **How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?**

Further science and technology research is needed to inform ways in which economic development can be better balanced with environmental protection in the Arctic. With the strengths of the UK research and technology development community, there are opportunities to contribute in this respect, including in collaboration with Canadian researchers. The planned Canadian High Arctic Research Station (CHARS) is one avenue for research collaboration. Based in Cambridge Bay, Nunavut, CHARS will anchor a strong research presence in Canada’s Arctic and advance Canada’s knowledge of the Arctic with world-class research to improve economic opportunities, environmental stewardship, and the quality of life of Northerners and all Canadians (please see www.science.gc.ca/chars)
for more information). One of the short-term priorities in the first CHARS Science and Technology (S&T) Plan (2014-15 to 2018-19) is strengthening baseline information to support assessment, regulatory approvals, and management for resource development. Important work is also being carried out in Canada’s North by other research groups and institutions to inform sustainable resource development practices. For example, research is being conducted at the Yukon Research Centre to improve mine water treatment and management and terrestrial reclamation practices in the Arctic.

It is important that Northerners have a central role in decisions regarding how best to balance economic development activities that are taking place in Canada’s North with environmental protection in the Arctic. The involvement and local knowledge of Northerners is also critical with respect to research and monitoring to better understand changes in the environment stemming from resource development and identify ways in which these impacts can be minimized.

4) What are the human aspects of the expected climatic and economic changes in terms of local populations, current and future?

There are numerous human aspects associated with the expected climatic and economic changes in terms of local populations, both current and future. Given existing challenges and the rate and magnitude of environmental and economic change that is occurring in the Arctic, it can be difficult for Northerners to adapt.

Aboriginal Northerners have a deep connection with the land that has been transmitted across generations. Environmental changes in the Arctic, therefore, have significant impacts, especially on well-being. For example, changing habitats and declining wildlife populations in many caribou herds can reduce access to nutritious and culturally important country foods that are significant for mental and physical well-being. Reduced sea ice and extreme weather events can make it difficult to access the land for subsistence harvesting. While subsistence harvesting is important for food, it also serves as a way of life and a means to transfer culture and community values. The shift from country foods towards less nutritious store-bought foods also has health implications such as increased chronic disease.

In many areas of Canada’s North, infrastructure and transportation systems are inadequate to meet current and future use and design, and maintenance practices have been poorly adapted to permafrost conditions. Warming permafrost can, in turn, impact stability and accelerate the deterioration of infrastructure. The reliance on imported diesel fuel, along with inadequate infrastructure and transportation systems, contributes to a high cost of living and doing business.

There is concern among many Northerners about potential negative cultural, socio-economic and environmental impacts on communities from increased resource development. For example, it may be challenging for some Northerners to benefit from increased job opportunities that this development may generate if they lack the required skills and training. With the dependence of the northern economy on resource development, Northerners are vulnerable to the accompanying boom-bust cycle. While
efforts have been made to enhance economic diversification by developing and/or strengthening other areas such as tourism, further work is required.

It is important for Northerners to play a central role in shaping development that occurs in the North. Decision-making processes used within some northern regulatory and co-management boards may not be reflective of more traditional Aboriginal approaches to governance. This can, in turn, reduce the capacity of these boards to more fully incorporate traditional knowledge into their practices and in turn affect the extent of participation and influence of Aboriginal peoples in decision-making.

5) Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?

Given the magnitude and extent of changes and interconnectedness, more data is needed to make informed policy decisions. Based on the findings of the Commission’s State of Northern Knowledge in Canada report, further data is needed to provide a better understanding of the following:

- **Preparing for large-scale resource development** – current socio-economic, cultural and environmental conditions, including the needs of communities, and the impacts of resource development; and climate change impacts on resource exploration, production and delivery to inform adaptive measures and technologies;
- **Increasing community sustainability** – vulnerabilities of current infrastructure and transportation systems and climate change implications for the built environment through monitoring and assessments; and labour force characteristics at the industry and community levels;
- **Strengthening resilience** – public health status of Northerners through enhanced surveillance; and social determinants of health; and,
- **Understanding environmental change** – baseline conditions; how northern ecosystems function (including terrestrial, coastal, freshwater, marine) and how environmental and human-induced change will affect them, including cumulative effects; complex feedbacks such as climate-vegetation-hydrology-permafrost relationships; subsurface carbon, methane and contaminant stores including estimates and characterization; impacts of the changing cryosphere; and wildlife population sizes, trends, and geographic ranges, and the impacts of habitat change.

Given the complex and interconnected nature of the drivers of change in the Arctic, and the overlapping consequences for Northerners, their culture, communities, and natural and built environments, there is a need for further collaborative, multi-disciplinary research and response from both Arctic and non-Arctic states. Given substantial capacity and knowledge of the Antarctic environment, the UK research community is well placed to transfer its expertise across the Polar Regions where relevant to assist in addressing environmental gaps in knowledge in the Arctic.

In order to ensure that research is able to address priority information gaps and that new knowledge is translated readily into improved policies that are appropriate in the northern context, strong involvement of Northerners, including community-based groups and
organizations, is needed in all stages of research. Additional northern capacity is, however, needed in this regard which can, for example, be addressed in part through research partnerships with northern Aboriginal groups, and field-based and mentored research relationships.

6) Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?

Community-based participatory processes have been undertaken in Canada’s North in order to increase capacity, knowledge and understanding within communities of climate change related vulnerabilities and impacts in areas such as health and well-being and food security. These processes have also been used to inform the development of community-based adaptation strategies, many of which involve the use of traditional knowledge and are holistic in nature. For example, in Nunatsiavut (northern Labrador), the ‘Going Off, Growing Strong’ community-based initiative works to addresses mental wellness and food security while strengthening resiliency and community and cultural ties by pairing at-risk youth with elders to provide them with the opportunity to go out on the land and learn to harvest country foods for a community freezer. Given that the socio-economic, cultural, and environmental contexts and adaptive capacities of communities can vary across the North, there is a need to further develop, deploy and test community-based adaptation strategies, and evaluate the extent to which current strategies are effective in response to environmental risks. Further environmental monitoring is also needed in this regard, including that which is community-based, to provide baseline information and enhance community capacity.

Much of the infrastructure (housing, community, industry, energy) and transportation systems in Canada’s North have been built according to southern-based standards that have not been adapted to the current and changing northern environment. While much effort has been made to better characterize permafrost terrain, identify vulnerabilities, adapt building codes and practices, and improve engineering approaches, further made-in-the-North solutions and testing and adaptation of southern-based approaches are needed.

There are opportunities for the UK research community to collaborate with Canadian researchers and Northern communities to further develop, deploy, and test adaptation strategies. For example, the planned world-class Canadian High Arctic Research Station (CHARS) will undertake science and technology research in support of its current 2014–15 to 2018–19 Science and Technology Plan, which focuses on strengthening baseline information preparedness for development; increasing the use of alternative and renewable energy; better predicting the impacts of changing ice, permafrost and snow on shipping, infrastructure, and communities; and supporting infrastructure for development. Collaborative research opportunities also exist with other Canadian researchers and research institutes and stations located across Canada’s North, many of which are part of the wider Canadian Network of Northern Research Operators (CNNRO) (please see http://www.cnro.ca/ for more information), who are deploying and testing climate change mitigation and adaptation strategies local to the Arctic.
7) **Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?**

Given the magnitude of change and associated implications for people, structures, and the natural environment, further science and technology research is needed to better understand, predict, and appropriately respond to changes. There is an opportunity for increased science and technology cooperation among Arctic and non-Arctic states, including undertaking collaborative research and sharing research logistics and infrastructure.

There is an opportunity for increased participation of Northerners, including community-based groups and organizations, in decision-making at all levels to ensure that Northerners are able to shape their destinies and the destiny of the North. This extends to research, where the involvement of Northerners is essential in ensuring that research is undertaken to address areas of priority and that new knowledge is translated readily into improved policies, programs, interventions and services that are appropriate in the local, northern context.

8) **How effectively does the UK interact with Arctic governance structures? Is the UK Government’s approach, as set out in the Arctic Policy Framework, proportionate and appropriate?**

As stated in *Adapting to Change: UK Policy Towards the Arctic*, science and cooperation are important. The Memorandum of Understanding on polar research cooperation signed in 2008 by the Government of Canada and the UK Government serves as a framework that can facilitate this. Significant opportunities for partnerships and collaboration between the Canadian and UK polar research communities exist with the planned world-class Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut (http://www.science.gc.ca/chars) and with other Canadian researchers and research institutes and stations located across Canada’s North, many of which are part of the wider Canadian Network of Northern Research Operators (CNNRO) (please see http://www.cnnro.ca/ for more information).

The Canadian Polar Commission is committed to continuing and strengthening its work with Canadian and international institutions, including the Natural Environment Research Council, British Antarctic Survey, and other members of the UK polar research community, to assist in identifying scientific priorities and facilitate science collaboration in the Polar Regions through collaborative research and the sharing logistics and research infrastructure in the Polar Regions.

*September 2014*
TUESDAY 22 JULY 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Moynihan
Lord Soley
Baroness Symons of Vernham Dean
Lord Tugendhat

Examination of Witnesses

Professor Robin Churchill, University of Dundee, Professor Maurice Mendelson QC, Blackstone Chambers, and Professor Philip Steinberg, Centre for Borders Research, University of Durham

Q50 The Chairman: Professors three, I welcome you to the Select Committee on the Arctic. This is our fifth public evidence session. Today we have been looking at security and defence and now at the law of the sea, UNCLOS in particular. I remind you that we are being broadcast. I think you have a good idea of the sort of questions that we will ask. I ask you to try to keep your comments to the point. I know that is sometimes difficult, as we ask broad questions on occasion. In particular, I remind you that you do not all need to answer all the questions, but if you have something important to contribute, please do so. We leave it up
to you on who wants to lead on which questions. Perhaps Viscount Hanworth could start us off.

**Q51 Viscount Hanworth:** I have a general question about how the provisions of UNCLOS apply to the Arctic in respect to the various areas of the ocean—namely, the territorial and contiguous seas, the exclusive economic zone and, indeed, the continental shelves. The provisions of Article 76 of UNCLOS, regarding the continental shelves, seem to me to give inordinate rights to the seaboard nations. I also presume that any objections to this would have been muted by the supposition that these nations would, in reality, have rather little interest in the distant reaches of the continental shelf. Could you comment on this? Also, could you tell me whether there is any likelihood of a moratorium being declared in respect of the regions surrounding the North Pole, similar to the moratorium that prevails in the Antarctic?

**Professor Maurice Mendelson QC:** I think that the chances of the present regime being changed regarding the continental shelf in particular and its extent are negligible. Originally, from about 1945 onwards, states have claimed sovereign rights—not full sovereignty, but sovereign rights—over the natural resources, living and non-living, of the seabed. Originally, this was regarded as being only the natural prolongation under the sea of the land—the continental crust—and it went out only for a relatively short distance. Because of a number of developments, one of which was the emergence of the concept of the exclusive economic zone, going up to 200 nautical miles from the baselines, it was decided at the third UN Conference on the Law of the Sea, the one that produced the Law of the Sea Convention in 1982, that all coastal states that did not have others in the way, as it were, could claim up to 200 nautical miles regardless of whether they had a real natural prolongation or not. It is a bit like the caucus race in *Alice in Wonderland* where all the creatures have to have a prize.
Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

That was rather the philosophy at the Law of the Sea conference and it was generally accepted with little demur.

Countries that have a real natural prolongation beyond 200 miles were certainly not willing to give that up as well, so you have the states with long natural prolongations, such as the United States, the United Kingdom, Canada, Australia and so on, definitely wanting to hang on to that, and it was generally accepted that they would be able to do so. The only complication was that there is no sharp division geologically between the end of the physical continental margin and deep seabed—the abyssal plain—which are supposed to be under a different regime. Very complicated scientific criteria—or a menu, if you prefer—were drawn up and set out in Article 76, which enabled the outer limit of the continental margin to be determined. Then you have this system of the Commission on the Limits of the Continental Shelf, which is supposed to police this, if that is not too strong a word.

In respect of the second part of Lord Hanworth’s question about the possibility of a moratorium, personally I think that it is extremely unlikely. The moratorium embodied in the Antarctic Treaty came about at a fairly unique period in history where—you will have to forgive these metaphors—there was a thaw in relations between the West and the Soviet bloc and it was felt that one way of giving effect to that was through scientific co-operation in, among other places, the Antarctic. The nature of the territorial claims, such as they were in the Antarctic, was rather special and different from what you find elsewhere. You had countries that were not riparians of the Antarctic, such as the United Kingdom, but others too, making claims there. So in 1959 there was a unique moment and opportunity. The Arctic is rather different and I do not see that the rather small number of riparian states—the eight riparian states—are likely to agree to any internationalisation of the area. I think
Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

there is scope for greater co-operation. Indeed, recently there has been greater co-operation in non-contentious matters.

The Chairman: Professor, can I make one request? When we talked briefly before the session started, you said that it would take a long time to go through the questions that we wrote down originally about how the provisions of UNCLOS apply to a body of water such as the Arctic Ocean and so on. Rather than go through that mechanically, would it be possible to give us a written answer, which we could use for the report?

Professor Maurice Mendelson QC: Certainly.

The Chairman: That would be a useful approach to that side of it.

Q52 Lord Hannay of Chiswick: I have a follow-up question. Does the fact that one aspect of the Law of the Sea Convention was reopened in the 1990s, on deep-sea mining, but none of the rest of it was rather reinforce your view of the likelihood of anyone contesting the continental shelf arrangements?

Professor Maurice Mendelson QC: A further little tweak was made in 1995, when there was a straddling stocks agreement, but essentially it does not undermine your point. My copy of the Law of the Sea Convention is inscribed by a very distinguished practitioner and subsequently judge in the International Court of Justice with the words, “Tantae molis erat”. The full quotation is “Tantae molis erat urbem Romanam condere”, or “What a great effort was required to found the city of Rome”. This Convention required such huge effort that I think states are very unlikely to want to or to be able to muster sufficient unanimity or agreement to amend it in these respects.

Viscount Hanworth: I also have a brief question. I believe that the limits on the continental shelf are defined by a submarine contour at 2,500 metres. I am seeking confirmation of that. If that is the case, clearly it is a huge depth—I can measure that from ground level up into
the sky and it is very far in my experience. Is it a reasonable contour or could it be much closer?

**Professor Maurice Mendelson QC**: There are in fact alternative criteria for measuring the outer limit, but it is essentially the choice of the coastal state which one they want to deploy. I am sorry, but I do not quite follow the point about the height, because this is height under water.

**Viscount Hanworth**: I was intuiting what sort of depth it would be, simply because I know what it equates to above sea level.

**The Chairman**: Shall we let Professor Churchill come in?

**Professor Robin Churchill**: Thank you, Lord Chairman. I think that what has just been said is an oversimplification of the position under the convention. The outer limit is fixed either by reference to points that are 60 miles from the foot of the continental slope or points where the thickness of the sedimentary rocks is at least 1% of the distance from that point to the foot of the continental slope. Each of those criteria is subject to two overall limitations. One is the 2,500 metre isobath; the other is 350 miles from the baselines. There is a further provision, which is particularly relevant to the Arctic, especially the Russian Arctic, which is that you can go beyond 350 miles on submarine ridges. So I think the position is perhaps a little more complicated than was indicated previously.

**The Chairman**: I think we are going to move on to Lord Moynihan at this point.

**Professor Maurice Mendelson QC**: Could I just add a further small correction? The outer limit can be 100 nautical miles from the 2,500 metre isobath. It is not the isobath itself.

**The Chairman**: Professor Steinberg, I think you wanted to make a point.

**Professor Philip Steinberg**: No, I think we have got that pretty well settled.
Question 53 Lord Moynihan: You have very kindly indicated that you are going to respond in writing to the practical details of the legal framework, which covered the totality of my original question.

The Chairman: I was really referring to question 1.

Lord Moynihan: With my gratitude for that and the time that it has given me, let me ask a related question about how disputes are settled and the role of the International Tribunal for the Law of the Sea. If you could cover that in writing, that would be very helpful. For the benefit of our work, what is really interesting is how this lex maritima will apply to the Arctic and where you see tensions developing between the application of that body of law to the fact that in the Arctic the focus tends to be on the work of the Arctic states in resolving issues. With Russia becoming increasingly prominent in exercising its authority in the rights of passage of foreign vessels through Russian waters, do you anticipate that your workload is going to increase significantly, particularly Professor Mendelson’s, in that context? In other words, where are the likely tensions going to develop in the context of this body of law with regard to fishing, navigation and shipping? How collaborative is Russia being within this framework?

Professor Robin Churchill: Thank you. That is a very big question. I will take the issues one by one. Before we leave the seabed completely, I should say that there is a likelihood of possible dispute about the outer limit of the continental shelf. Only the Norwegian outer limit of the continental shelf has been established in accordance with the convention—that is to say, the Commission on the Limits of the Continental Shelf making recommendations and then those recommendations being accepted by Norway. All the other Arctic states—to leave aside the United States for the moment—are in the process of doing that. Russia, for example, made a submission in 2001 and was told that the Commission on the Limits of the
Continental Shelf did not agree with its view of its outer limit of the continental shelf. The commission asked the Russians to go away and make a resubmission. Thirteen years later, they have still not done that. There are rumours that the Russians are going to do it, but one can imagine that there is a potential point of tension there, especially if the Russians and the commission do not agree where the outer limit of the Russian shelf is. It is still unknown what will happen with Canada and Greenland, because those submissions are still in the process of being considered.

There is also the position with the United States, which cannot make a submission because it is not a party to the convention. If it establishes the outer limit of the continental shelf beyond 200 miles unilaterally, there is the question of how far that may be accepted by other Arctic states and, indeed, by the generality of states.

As for fishing, within 200 miles that would be regulated by coastal states, but if in several decades the central Arctic becomes ice-free and open to fish—and, indeed, if there are fish there—there is still no regime beyond the general obligations of the Law of the Sea Convention to co-operate. The general view is that some sort of regime ought to be developed fairly quickly in a precautionary way to prevent the same kind of destruction of high-seas fisheries as has happened elsewhere. I think that Professor Steinberg will comment on the navigation issues.

**Professor Philip Steinberg:** Sure. Before getting into navigation, on the continental shelf delimitation there are two potential areas of contestation—perhaps that is a little too strong—or disagreement down the way. The first is the Commission on the Limits of the Continental Shelf determining geophysically where the limits should be, which, as was just mentioned, as been done only with Norway in the Arctic. Then, of course, if the limits of the shelf are found to be overlapping between two different countries, that in turn has to be
negotiated, just as it does with other maritime waters and boundaries. So there are two potential areas there, although, returning to the previous question, there is the question of how much this really matters. How much economic activity is really going to take place on the seabed in these extreme depths and extreme distances from land? Right now, even in more temperate, more accessible waters, no economic activity is taking place beyond the outer continental shelf, so certainly the Arctic would not seem to be a primary candidate for that kind of very high-risk activity.

Secondly, although it comes back to the first question and the complexities of the formula for defining the limits of the continental shelf, I want to point out as the representative from Durham University, which created the map that I see you all have in front of you—I did not create it; I came after they made the map, which is just a disclaimer—that the lines that you see on the map are the furthest hypothetical extent of where the lines might be drawn. What you see there is a mix of the 350 nautical mile limit and the 2,500 metre plus 100 nautical mile limit. Those are all the potential outer limits, but that in turn is dependent on determining that the continental shelf geophysically goes out that far. Those data, except in the case of Norway, have not yet been certified or made public, so I want to make it clear that what we see on that map is the potential, which very likely will not be realised when all the geological data comes in.

On the other challenges, to return to that question, the navigational challenges are posed not only by the melting of ice but by the persistence of ice. Right now—this is coming out a lot, particularly as Canada has tried to make its claims for the North-West Passage being internal waters—there are various references to the Arctic not being normal water because of its partially frozen character. Where does that change things? Once you take the specific climate of the Arctic away, in a lot of ways, as came out in the previous session, the Arctic is
much like any other maritime region and can be governed in such ways. The climate, though, provides real challenges for navigation and leads to the different livelihoods of the people who live there, which partly comes out in their permanent participation in the Arctic Council. These issues will come out more when we talk about Article 234.

Q54 The Chairman: I owe an apology to Lord Moynihan. I meant to quote the first question rather than the second, so I apologise to him for that. In fact, it would be useful if we could agree with our clerk afterwards who might give us formal evidence just going through the mechanics of how the law of the sea works and the disputes procedure. Perhaps I could press you on one issue. When we read a number of articles about the tribunal, we find that it seems to take an awfully long time to come to a decision and perhaps has a queue that is equal to those of other international courts. Is it respected? Does it have the capacity to deal with these disputes or does this need to be fixed by the United Nations?

Professor Robin Churchill: Perhaps I might respond to that. Under the convention, where a dispute cannot be settled by agreed means by the parties to the dispute, either party to the dispute can refer it to binding legal settlement. Then there is a choice of means: the International Court of Justice, the International Tribunal for the Law of the Sea, and arbitration. States can make a choice of means. As it happens, only about a quarter of the parties to the convention have made any choice at all and less than a quarter have chosen the tribunal. Only where the choice of the parties to a dispute coincides—in other words, where both parties to the dispute have chosen the tribunal—will the tribunal hear the case. Statistically there is a very small chance of the tribunal hearing cases. In fact, it has dealt with only half a dozen disputes so far for that very reason. Most disputes go to arbitration.

The Chairman: So are they sitting around twiddling their thumbs—in Hamburg, is it?
Professor Robin Churchill: Yes, in Hamburg. Not entirely, because the tribunal has two other kinds of jurisdiction. One is what is known as the prompt release of vessel jurisdiction where, if a fishing or other vessel is arrested for an alleged pollution offence and the coastal nation does not release the ship on payment of a bond, the tribunal can order its release. The other is that the tribunal can prescribe provisional measures to ensure that the rights of the parties are not injured pending a case that is being heard by an arbitral tribunal. That has happened in relation to one case involving the Arctic, which is the current case between the Netherlands and Russia over the arrest of Greenpeace’s ship the “Arctic Sunrise”. You may remember that last September Greenpeace protesters tried to board a Russian drilling platform in the Sea of Kara. The ship was arrested, as were the protestors. The Netherlands has brought a case against Russia, which is currently going to arbitration. Although the Russians have said that they do not intend to play any part in that arbitration, nevertheless the arbitration is going ahead without the Russians. The Tribunal for the Law of the Sea ordered provisional measures in that case, which were that the ship should be released upon payment of a bond and that the crew and protestors should be released. That did in fact happen, as part of a general amnesty by President Putin, along with the release of members of Pussy Riot and others. Whether he was influenced by the tribunal, whether it was world opinion or whether this just got swept up in the general amnesty, I do not know.

The Chairman: I think that if we knew the mind of President Putin, we might all be better off.

Lord Hannay of Chiswick: Could I just follow up that thought a little? Is it correct to say that a lot of weight is put in academic terms on the existence of this tribunal in Hamburg and its ability correctly, if empowered, to deal with disputes? All the anecdotal evidence that we have tends to point to a great unwillingness of countries to allow themselves to be
Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

submitted to the tribunal in Hamburg. For example, the Chinese reaction to the Philippines’ attempt to get their territorial waters dispute dealt with in that way is probably pretty instructive. Are we right in thinking that UNCLOS is capable, through the machinery that it has, of dealing with these problems in the Arctic, or is it a purely theoretical capability that may well be frustrated?

Professor Maurice Mendelson QC: My Lord Chairman, if I may say so, I think that this whole issue of the Tribunal for the Law of the Sea is a red herring. The Tribunal has decided only one maritime delimitation case. If you want to know how continental shelves, exclusive economic zones and so on get delimited between opposite or adjacent states, it is, first, by the International Court of Justice in The Hague, which has resolved quite a significant number of such disputes, secondly, by arbitral tribunals and, above all, by agreement between the states themselves. With great respect to that august tribunal, I personally would almost exclude it from the discussion. There are other means by which delimitation can take place.

I also stress, because I think that it is relevant here, that the machinery for delimiting between opposite and adjacent states is different from the machinery for deciding the outer limit of the continental margin beyond 200 nautical miles. That is the Commission on the Limits of the Continental Shelf. It is a body of scientists, not of lawyers—there is not a single lawyer on it. This is a further point that I wanted to underline: the Commission presents its own problems because it is extremely slow at determining these submissions. In 2011, it said that it thought that it would take until 2032 to resolve the most recent of those submissions. Since then, there have been something like 17 further submissions, so we are going way out to the 2050s, probably, not to mention the ones that have not yet been put in or the Russian one that has not been resubmitted.
The Chairman: That is very useful. Lord Hannay, do you want to continue with the United States?

Q55 Lord Hannay of Chiswick: There has already been some reference to the signature but non-ratification by the United States of the Law of the Sea Convention. Could you comment on how that affects the situation in the Arctic? Does the US lose by not ratifying this and bringing it into effect, although of course it treats it as customary international law? What impact does that have in the overall question of governance of the Arctic?

Professor Maurice Mendelson QC: The United States, as the Committee may know, initially refused to ratify the convention because it was dissatisfied with some of the provisions relating to the deep seabed, as well as probably on ideological grounds. However, when—due to a very large extent, I might say, to the efforts of British Foreign Office official, David Anderson, now retired—a new so-called agreement relating to the implementation of Part XI of the deep seabed mining provisions, perhaps more appropriately called the “agreement on the emasculation of Part XI of the Law of the Sea Convention”, was concluded, those obstacles were removed. Indeed, there was a joint statement, I think in 2012, from a number of eminent former Secretaries of State or National Security Secretaries such as Condoleezza Rice and Henry Kissinger saying that the obstacles had been removed so there was no reason not to ratify, while the current President and his predecessors have said that it is in the interests of the United States to ratify. The problem is in the Senate. It is clear that some of the opposition is ill informed. People think that it is going to stop them fishing in the lakes in their own states. The United States says that it regards the convention as embodying customary international law, which is a body of law developed through state practice that binds all states. But, as has already been indicated, the main disadvantage for the US is that it cannot get a determination from the Commission on the Limits of the Continental Shelf.
Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

that would be binding on all other member states regarding its outer limits. It does not have the legal standing to apply to that commission. That is one problem. Another problem is that the US has other interests in other parts of the world—for example, it is resisting some of China’s maritime claims in the South China Sea that the US regards as excessive—but it rather limits its ability in political terms to object to those claims and to rely on the Law of the Sea Convention if it is not itself a party.

Professor Philip Steinberg: Going back to the original question of whether the United States loses or gains anything, it really does not gain anything from not being a party to the law of the sea, certainly with regard to the recognition of the outer limits of the continental shelf margins, on which the US is going through the motions of gathering all the scientific data. I have asked people in the US Government, “What will you do with these data once you get them?”, and I have never really gotten a good answer. It does not appear as though ratification or accession is anywhere on the horizon. Even at the time when that was probably most likely, about eight years or so ago when there was a Democratic supermajority in the Senate of 60, it still was not the two-thirds necessary for ratification. I had a number of discussions with key Senate Foreign Relations Committee people at that time, and effectively they said, “We’re not going to bring it to a vote because we think we’ll lose, and that would just create a whole political cascade”. In terms of the damage caused to UNCLOS as a whole, though, it is arguable that the US consistently saying that it is customary law strengthens it.

The Chairman: What about legal security and investment?

Professor Philip Steinberg: That is of course where it hurts the US.

The Chairman: If ever economic development is going to take place it is going to be very expensive; you have to raise capital and there needs to be legal certainty.
Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

**Professor Philip Steinberg:** Right. That will hurt the US because it will discourage investment in its exclusive economic zone or outer continental shelf; it does not have the same level of certainty under UNCLOS and has not been delimited in the same way in which other countries’ shelves are. That, of course, is a point that is being raised by the mining and petrochemical industries in the US—much the same dynamic that led to the original seabed regime in 1982 where various interested parties, both nation states and private enterprise, were willing to give up a degree of rights in return for security for their investments.

**Q56 The Chairman:** We move on to a question that came up regarding Article 234. I knew of UNCLOS but had never heard of Article 234 until it came up in one of our seminars. It appears to be important because ice is disappearing and it gives special rights. I do not want to get into this in huge detail, but it seems to be one of the dynamics over the next decade, or beyond that, and I would like very briefly to understand the implications.

**Professor Philip Steinberg:** The first thing to specify is exactly what the rights are that Article 234 grants. They are relatively limited. Basically, coastal states can exercise additional environmental protections in their exclusive economic zones, if those zones—this is a direct quote—have “the presence of ice ... for most of the year”. Of course there is a lot of ambiguity in that. It also has to be non-prejudicial to transit. Obviously all those issues themselves can be contested. What does “non-prejudicial to transit” mean? What does “environmental protection” mean, since all kinds of things are done under the name of environmental protection? But there is also the question: what is “the presence of ice”? The presence of ice is in no way identified. Clearly it does not have to be 100% ice cover, because if we are thinking about the environmental hazards caused by ice to navigation, floating ice sheets are often much more dangerous than a solid chunk of ice that you are taking an icebreaker through and you know what you are going through. Canada, in interpreting this,
Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

has chosen the threshold of 10%, so if on a satellite image 10% of the pixels show iciness, they say, “These are ice-covered waters”, but that is an entirely arbitrary decision. “Most of the year” is of course easier to define; presumably it is more than six months. Depending on how one defines “ice-covered”, which presumably means a substantial presence of ice, for the foreseeable future in the Arctic there is likely still to be a substantial amount of ice for most of the year—that is, for more than half the year. Certainly the weakening of ice cover means that that cover will not be multiyear ice since it freezes and melts each year, so it is much easier to take an icebreaker through and the like. That is likely to encourage navigation but is unlikely to mean that Article 234 will not be relevant. However, the other half of that is the fact that Article 234 does not give that many protections anyway; there is not that much that states can do under the article. It gets conflated with the whole issue of the North-West Passage and Canada drawing straight baselines and declaring internal waters, but you do not need iciness to do that. In fact, Article 234 becomes irrelevant if they are Canada’s internal waters.

Q57 Lord Soley: I would like to understand a little better if I could the effectiveness of UNCLOS in settling potential disputes in the area of the maritime map, if you like. I found your map very helpful, although I was slightly puzzled. Whenever I see shaded areas I get worried, because they are usually areas of potential conflict. There is a bit between Denmark and Russia where we know there have been disputes over the Pole, but Canada comes into that as well. So, first, how effective is UNCLOS at settling potential disputes? Secondly, a very simple question: how settled would you describe the maritime boundaries of the Arctic at the moment? Are they settled or seriously unsettled?

Professor Philip Steinberg: On the first question about how UNCLOS is leading to the settlement or potentially facilitating it, seabed mapping is a very good example, in that you
have contesting states actually mapping together. The US and Canada, which you can see on
the map have a contested area between them—that is an actual maritime boundary, not
just the limit of the shelf—are working together in mapping the border regions. Effectively,
the US is doing the bathymetric data and Canada is gathering the seismic geological data,
because if the US were to make a filing, both states would need both sets of data to make
their filings. Likewise, on the other side, Canada and Denmark, which also have disputed
regions, are sharing data and working together on the same research ships and the like. So in
that sense the provisions for beginning to define the rules are being worked through on the
ground.

How settled are the boundaries? The states are all making their filings to the Commission on
the Limits of the Continental Shelf. In many ways, we have to wait until the commission
makes all the Arctic determinations, which presumably will be in quite a while, and then see
how much overlap there is. Here I am echoing something from the previous session: given
that these are often actually relatively low-stakes conflicts in terms of economic good,
national pride of all sorts is involved in several of the countries, but very often we see
conflicts that reflect conflicts in other regions, so they should be relatively easy to resolve
since there is a mechanism for resolving them.

Professor Robin Churchill: If I may, I will just add one or two points on your second question
about the boundaries. If we are talking about boundaries between neighbouring states,
Norway and Russia have agreed the whole of the maritime boundary from the land terminus
to the outer limit of the continental shelf. There are agreed boundaries between Greenland
and the Norwegian island of Jan Mayen, between Iceland and Jan Mayen, and between
Iceland and Greenland. There is a boundary between Greenland and Svalbard, which belongs
to Norway, covering the area within 200 miles, but I understand that they have agreed in
principle on the boundaries either side of that. There is an area of outer continental shelf—that is, beyond 200 miles—in the Norwegian Sea called the Banana Hole because of its shape, and there is a three-party agreement between Iceland, Denmark and Norway where they have agreed provisional boundaries, subject to possible revision in light of the recommendations from the Commission on the Limits of the Continental Shelf. The main boundary that is not agreed is between Canada and the United States in the Beaufort Sea, which has been a long-standing bone of contention and as far as I know is not close to being resolved, is it?

**Professor Philip Steinberg:** No, but it is not being worked on either. It is not causing friction. It is not an area where anyone wants to be drilling for oil.

**The Chairman:** There are a couple of supplementaries. Lord Soley wants to ask a quick one, then Viscount Hanworth, then Baroness Symons. I want to make sure that we leave time to talk about the countries in the area as well.

**Q58 Lord Soley:** To be clear, all three of you are saying UNCLOS is basically fit for purpose in what it is doing to limit potential dispute. You think it is about right. Is that correct?

**Professor Maurice Mendelson QC:** The provisions of the Law of the Sea Convention about delimitation of the continental shelf and exclusive economic zones between opposite or adjacent states are extraordinarily vague. They basically say simply that these areas shall be delimited in accordance with international law in order to achieve an equitable solution. Happily, however, the case law of the International Court of Justice and arbitral tribunals has given a number of pointers, so that it is not a totally subjective test, although it would be equally true to say that these are not mathematical criteria.

**Q59 Viscount Hanworth:** It seems to have been a difficult and lengthy process to gather information on the topography of the continental shelf and the seabed. I just wonder...
whether this is indeed the case. I had imagined that all the information had been gathered many years ago as an adjunct of submarine warfare, so the question arises: is there a genuine difficulty in determining the topography, or is it mainly a sort of diplomatic blind?

Professor Philip Steinberg: From my understanding it is genuinely a long, painstaking, difficult and very expensive process. I do not know whether either of the other witnesses can speak about the military data. It could be that some of them are not being made public even within their countries. Ultimately, the deliberations by the Commission on the Limits of the Continental Shelf are not public and the submissions are not public until they are agreed upon, but there are some provisions in which potentially classified data could work their way into the open. In a lot of cases, though, I believe that even those data probably do not exist and are being gathered now.

Professor Robin Churchill: A lot of the problem is the interpretation of the data. Whether something is part of the natural prolongation of the state or whether there is some discontinuity is one of the major issues. It is not totally straightforward.

Viscount Hanworth: Those are the ridges that you were talking about.

Professor Robin Churchill: Yes.

Q60 Baroness Symons of Vernham Dean: I might be being very dense about all this, but I could not help noting the point that you made earlier about the Tribunal for the Law of the Sea being a bit of a red herring, that it had not actually decided very much—one tribunal case, I think—and that the rest were dealt with at the International Court of Justice in The Hague. The US is not a party to UNCLOS, while Russia has gone away for 13 years to think about resubmitting a case. With regard to the business about seabed mapping, the US and Canada could have done that anyway without UNCLOS surrounding them. I suppose I am saying that it seems to be a huge edifice for not really deciding very much.
Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

**Professor Maurice Mendelson QC:** If you are talking about the edifice of the International Court of Justice, arbitral tribunals, and to a limited extent the International Tribunal for the Law of the Sea, first you have to bear in mind that the existence of these means of settlement are themselves important, because they create not binding precedents but guidelines and so on and so forth, which can be used in negotiating boundaries. Secondly, quite often states like to have an international tribunal to blame if the line gets put in the wrong place. When the United Kingdom delimited its boundary with Norway and huge fields in the North Sea turned out to be on the Norwegian side, Ministers and civil servants got quite a bit of egg on their faces. So when it came to the English Channel and the Western Approaches, it was thought a good idea—no doubt there were other reasons—to go to a special Court of Arbitration and say, “You do it”, because if there turned out to be an oilfield on the other chap’s side, you could say, “It wasn’t our fault. We didn’t agree to this. It was this tribunal”. So there are good reasons why the third-party settlement system exists, although obviously if states can agree between themselves, that is best.

**Baroness Symons of Vernham Dean:** But when the biggest and most powerful economy in the world is not a party to it, and another very important state has decided that it will take its bat and ball away for 13 years, does that not undermine the value of such an enormous edifice of law?

**Professor Maurice Mendelson QC:** The outer-limit issue is one thing—the reference to Russia is about the outer limit and so on and the United States being precluded—but the system of boundaries and quite extensive areas of continental shelf up to 200 miles is all a going concern. It works, and it does not exist only for the benefit of the Arctic; it applies throughout the world and is quite useful for solving disputes between states. Even the
United States of America went to the International Court of Justice with Canada over the Gulf of Maine dispute, for example. It is a tool that states find useful.

*Professor Philip Steinberg:* I would just add that it also provides a language, as it were, for each state arguing for what it wants, and in that sense it delimits the debate and provides potential grounds for a compromise. So whether it is China saying that the South China Sea is its historic waters—and one can debate whether this huge swathe of water very far from its boundaries is potentially its internal waters—or various straight baseline directives that are likewise challenged, in particular by the US, as illegitimate in terms of preserving freedom of navigation and for drawing straight baselines, the argument is being made back to UNCLOS and back to the standards that are being set up. That then provides a means for challenging whether that is, say, a legitimate declaration of historic waters, a straight baseline or the like, and out of that challenge comes some form of compromise. Whether it is formally worked out in arbitration, in the International Tribunal for the Law of the Sea, in the ICJ or diplomatically, it gets a dialogue going.

*The Chairman:* Professor Churchill, did you want to add a sentence on this?

*Professor Robin Churchill:* I will make just two or three very small points very quickly. The importance of the Law of the Sea Convention is that it is really in a sense a framework, particularly for jurisdiction and the way the sea is divided up into zones. We take that for granted now, but that was not the position when the convention was being negotiated; there were huge disagreements about how far offshore states had jurisdiction over fisheries, the protection of the environment and so on.

The point about dispute settlement is that historically in international law most disputes have never been settled by an international court; they have nearly always been settled by negotiations or other diplomatic means. International courts and tribunals are really a back-
up, and sometimes the fact that states know that there is a court there induces them to come to an agreement, which they might not have done otherwise, because they do not want to be taken before a court.

**The Chairman:** Baroness Symons, do you want to continue with a very short supplementary on this?

**Q61 Baroness Symons of Vernham Dean:** That is a nice little segue into China, really. Obviously there is growing international interest in the Arctic, whether it is because of climate change and the ice melt or whether it is because of the increasing interest in the commercial potential of the region. What is the attitude to UNCLOS of states that have been developing those interests in the region? I touched a moment or two ago on the United States and Russia in particular, but what about China? Is China engaged at all? Do we know anything about how it views UNCLOS?

**The Chairman:** I assume that all three of you probably have some interest in this question, so perhaps I could go along the row for a concise answer to the question. One thing that also comes out of this is that China has unofficially been taken to court over the Philippines. Some of the literature that we have read has suggested that China might say, “Well, forget UNCLOS. We’ll move out”.

**Professor Robin Churchill:** There is some Chinese practice generally that is not in accordance with the convention, but you can say that about a lot of states, so the Chinese are not unique in that. The dispute with the Philippines has gone to arbitration; it has not gone to the International Tribunal for the Law of the Sea because neither the Philippines nor China had chosen that as their preferred means, and China has said that it will not take part in the arbitration proceedings, which is very unfortunate. Actually, it could probably have put up a good case that the tribunal did not have jurisdiction, but it has chosen not to do that.
Professor Robin Churchill, Professor Maurice Mendelson QC, and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

**Professor Maurice Mendelson QC:** I think it is important to stress that international adjudication or arbitration requires consent, either ad hoc or in advance. China clearly has some interests in Arctic waters, notably fishing. I am not sure that it will be that interested in the North-West Passage or the northern passage because there are other alternatives, one of them being—I declare an interest here—the Grand Nicaragua Canal project, which will enable goods to be moved through rather more temperate waters from one side of the world’s oceans to the other.

**Professor Philip Steinberg:** A very quick answer is that I am not aware of any state that has challenged UNCLOS applying to the Arctic. There has certainly been some creative interpretation in some cases in suggesting that because of certain issues in the Arctic—and of course Article 234 already suggests this kind of thinking—there might be specific provisions, or certain ways of applying, UNCLOS, but I do not believe that the overall framework of the UNCLOS zonation of the ocean that you see reflected on the map and the like has been challenged by anyone.

**Lord Soley:** Very briefly, you have left me feeling—I think this is right, but maybe it is not—that UNCLOS, together with other methods, is really a series of processes that are allowing us to resolve the problems without difficulty, and that it is not a set body as such but is like the British constitution: it does not exist but it works. Is that a fair summary of where you are at?

**Professor Robin Churchill:** I think there is a great deal in that, yes. As I said before, it is a framework treaty, and a lot of the details get filled in by other agreements elsewhere, whether bilateral, regional and so on. As I think was mentioned in the previous session, there are now two regional agreements in the Arctic. It is typical of seas generally that more
detail on fisheries, environmental issues and navigational issues get supplied by agreements outside UNCLOS but in accordance with its general principles.

**Q62 The Chairman:** Very quickly, there is just one area that I want to clarify. We have mentioned the North-West Passage a number of times. On the map, the baseline, which is the fundamental thing from which everything is measured, is drawn by Canada across huge areas of sea from one island to another. Is that interpretation unique worldwide, is it derided generally, is Canada really chancing its arm, or is it credible?

**Professor Maurice Mendelson QC:** It is being very creative but it is not the only state to have been creative in this way. Others resist it. There are some criteria. I would not like to express an opinion on whether it has been too creative, but certainly it is not unprecedented for extensive claims of that sort to be made. It also backs it up with an historic waters claim, although that is also contested.

**Professor Philip Steinberg:** In fact the two are necessary, because if straight baselines are not around historic waters, you do not have all the internal waters rights that come with historic internal waters. I believe that the United States has protested—how many hundreds of straight baseline claims around the world?

**Professor Robin Churchill:** Seventy-odd.

**Professor Philip Steinberg:** Is it just 70-odd? I thought it was over a hundred, but it is quite a long list.

**The Chairman:** Professor Churchill, Professor Mendelson and Professor Steinberg, thank you very much indeed for giving us your evidence today. We look forward to your written evidence on the factual detail of some of these areas of the world. At this point I end the public session, and I must ask members of the public to leave so that we can tie up our business here.
Following my appearance before the Committee on 22 July 2014 together with Professor Maurice Mendelson QC, Blackstone Chambers, and Professor Philip Steinberg, Centre for Borders Research, University of Durham, we were asked to provide answers in writing to the Committee’s questions. My colleagues are providing answers to Questions 1, 3, 5 and 6. Here I provide answers to Questions 2 and 4. This evidence is given in a personal capacity.

Question 2. How are disputes relating to the law of the sea typically settled? What is the role of the International Tribunal for the Law of the Sea? What part does the Commission on the Limits of the Continental Shelf play? What is the effect of decisions by these bodies?

How are disputes relating to the law of the sea typically settled?
1. Most disputes relating to the law of the sea, like most disputes in international law, are settled by direct negotiations between the States concerned. Litigation is very much the exception. The only dispute concerning the Arctic that has so far been litigated is the Arctic Sunrise case between the Netherlands and Russia, which is currently before an arbitral tribunal constituted in accordance with Annex VII of the UN Convention on the Law of the Sea (UNCLOS). The case concerned the arrest of Greenpeace protesters and their Dutch-registered vessel following an attempt to board a Russian oil platform in the south-eastern Barents Sea in September 2013. Russia is refusing to take part in the arbitration. It is unlikely that the tribunal will give its award before the latter part of 2015.

What is the role of the International Tribunal for the Law of the Sea?
2. Part XV of UNCLOS provides that where States cannot settle a dispute relating to the interpretation or application of UNCLOS by agreed means of their choice, either party to the dispute may, subject to some exceptions, unilaterally refer it to binding judicial settlement. States may at any time choose one or more of the International Tribunal for the Law of the Sea (ITLOS), the International Court of Justice (ICJ), arbitration in accordance with Annex VII or, for disputes concerning fisheries, the environment, marine scientific research and navigation, arbitration in accordance with Annex VIII as their preferred means for settling a dispute. If the choices of means by the parties to the dispute coincide, that will be the means by which the dispute is settled. Otherwise settlement is by means of Annex VII arbitration. Currently only 32 States have chosen the ITLOS as (one of) their preferred means. Of those States, two are members of the Arctic Council (Canada and Finland) and a further three (Germany, Italy and Spain) are observers. Thus, statistically the chances of an Arctic dispute being submitted to the ITLOS for settlement is quite small. It should also be noted that where litigation has been initiated under Annex VII, the parties may agree to transfer the case to the ITLOS, thus saving the parties the costs of arbitration. This has happened in a few cases (though none involving the Arctic).

3. The ITLOS has two other roles part from settling disputes. First, where a dispute has been referred for settlement to an arbitral tribunal, the ITLOS may be asked to prescribe provisional measures of protection to preserve the respective rights of the parties or to prevent harm to the marine environment pending the establishment of the Annex VII tribunal if the urgency of the situation so requires. This happened in the Arctic Sunrise case, when the ITLOS, in response to a request from the Netherlands, ordered Russia to release the Greenpeace protesters and their vessel. Second, Article 292 of UNCLOS provides that where a State has detained a foreign vessel for an alleged fisheries or pollution offence, and
it is alleged that the detaining State has not complied with the provisions of UNCLOS requiring the prompt release of the vessel and its crew upon the posting of a reasonable bond or other financial security, the flag State of the detained vessel may seek its release by applying to the ITLOS. The ITLOS is to determine the level of the bond or other financial security, and once the latter has been posted, the detaining State must promptly release the vessel.

**What part does the Commission on the Limits of the Continental Shelf play?**

4. Article 76 provides that a State that considers that its continental shelf extends beyond 200 nautical miles in accordance with that article must make a submission setting out the data supporting its view of the extent of its shelf to the Commission on the Limits of the Continental Shelf (CLCS) within 10 years of the entry into force of UNCLOS for that State or 2009, whichever is the later. The CLCS, which is a body of 21 experts in geology, geophysics or hydrography sitting in a personal capacity, is to examine the submission and make a recommendation to that State. Limits established on the basis of a CLCS recommendation are ‘final and binding’. The main reason for requiring States to make submissions to the CLCS is to try to ensure that they comply with the complex criteria of Article 74(4)-(6) when establishing the outer limit of their continental shelves beyond 200 miles from the baseline. If a coastal State disagrees with the recommendations of the CLCS, it must make a revised or new submission. The UNCLOS is silent as to what happens if a coastal State disagrees with the recommendations of the CLCS in respect of its revised or new submission. A subsidiary role of the CLCS is provide scientific and technical advice to a coastal State preparing its submission, if so requested.

5. Of the Arctic coastal States, Denmark (in respect of southern and north-eastern Greenland and the area north of the Faroe Islands), Iceland (in respect of the Reykjanes Ridge south-west of Iceland and the Aegir Basin east of Iceland), Norway and Russia have made submissions. The CLCS has so far approved the submissions of Denmark (in respect of the Faroe Islands) and Norway. The CLCS approved Russia’s submission in the Barents Sea but asked it to make a resubmission for the central Arctic, which it has not yet done. Canada has given preliminary information that it intends to make a submission in respect of the Arctic. Overall, the CLCS had received 75 submissions and two revised submissions and had made 20 recommendations as of 25 September 2014.

**What is the effect of decisions by these bodies?**

6. Decisions of the ITLOS are binding. Therefore, any failure to comply represents a breach of international law. The effect of decisions of the CLCS is explained above.

**Question 4. Do the provisions of UNCLOS limit the potential for dispute over maritime boundaries in the Arctic? To what extent are boundaries in the Arctic Ocean ‘settled’?**

**Do the provisions of UNCLOS limit the potential for dispute over maritime boundaries in the Arctic?**

7. UNCLOS provides, in Articles 74 and 83, that EEZ and continental shelf boundaries between neighbouring States are to be delimited ‘on the basis of international law . . . in order to achieve an equitable solution.’ Clearly this is a very vague and rather subjective formula. However, the reference to ‘international law’ includes the case law of international courts and tribunals. Since around 2000 the ICJ, the ITLOS and arbitral tribunals have developed a
consistent methodology for delimiting maritime boundaries. This is the so-called ‘equidistance/relevant circumstances’ method, according to which a court first draws an equidistance line as the provisional boundary and then modifies it in the light of any relevant circumstances in order to reach an equitable solution. Relevant circumstances in this context refer primarily to geographical circumstances, such as the shape of the coast (for example, an excessively convex or concave coastline will have a significantly distorting effect on an equidistance line) or the presence of small islands (which may also distort an equidistance line in ways that would not be regarded as equitable). While the equidistance/relevant circumstances method does not mandate a precise boundary, it limits the scope of possible boundary lines to a relatively narrow spectrum, and in the ten or so cases in which it has been applied has generally led the court to find a solution that has been acceptable to the parties.

8. Articles 74 and 83 also require States, pending agreement on a boundary, to make every effort to enter into provisional arrangements of a practical nature and not to take action that would jeopardize or hamper the reaching of a boundary agreement. In practice, a number of provisional arrangements of a practical nature have been agreed. Furthermore, Articles 74 and 83 provide that where States cannot reach agreement on a boundary within a reasonable period of time, they shall resort to the dispute settlement procedures of Part XV of UNCLOS, which were outlined above. However, it should be noted that Article 298 allows States at any time to make a declaration excluding disputes relating to the delimitation of maritime boundaries from the compulsory dispute settlement procedures of section 2 of Part XV. So far only 30 States parties to UNCLOS have made such declarations, but they include two Arctic States, Canada and Russia. Denmark and Norway have also made such a declaration in respect of arbitration, but not in respect of the ICJ, which is their preferred means of settlement.

To what extent are boundaries in the Arctic Ocean ‘settled’?

9. In so far as the question refers to the outer limit of the continental shelf (the boundary between the continental shelf and the International Seabed Area), the position has already been explained in answering question 2. As regards maritime boundaries between neighbouring States, the position is as follows:

Canada-USA (Beaufort Sea). No boundary yet agreed. However, the lack of a boundary is not seen as a pressing issue by either State.
Denmark (Faroe Islands)-Iceland-Norway. Boundary beyond 200 miles in the Banana Hole in the Norwegian Sea agreed in 2006, subject to possible readjustment following CLCS recommendations.
Denmark (Faroe Islands)-Norway. Boundary within 200 miles agreed in 1979.
Denmark (Greenland)-Norway (Jan Mayen). Boundary within 200 miles agreed in 1995.
Denmark (Greenland)-Norway (Svalbard). Boundary within 200 miles agreed in 2006. Agreement in principle on the boundary beyond 200 miles.
Norway-Russia. Whole of the boundary in the Barents Sea, including areas beyond 200 miles, agreed in 2010.
Russia-USA. Boundary both within and beyond 200 miles agreed in 1990.
10. Depending on where the outer limits of the Canadian, Greenlandic and Russian continental shelves are eventually established in the central Arctic, there may be a need for boundaries between those shelves.

*September 2014*
Evidence Session No. 6
Heard in Public
Questions 63 - 80

Members present
Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Moynihan
Lord Oxburgh
Lord Soley
Lord Tugendhat

Examination of Witnesses
Kiran Khosla, International Chamber of Shipping, Colin Manson, Manson Oceanographic Consultancy, and Dr Martin Stopford, Clarksons Research Services

Q63 The Chairman: Welcome to the Lords Arctic Committee and our first session on shipping. I think you have some idea of the sort of questions that we will be asking. I remind you again that you do not all necessarily need to answer all the questions, but if something is very pertinent to you, please contribute. We are being recorded and a transcript will be taken. Perhaps I could ask you to introduce yourselves briefly.

Kiran Khosla: I am Kiran Khosla. I am the legal director of the International Chamber of Shipping. Our organisation represents national shipowner associations. We are their international body, so we represent shipowners at the IMO and at other regulatory fora, and
we deal with: the safety of ships; maritime security; seafarers and employment issues, and legal liability and insurance issues for ships at the international level. 5

Lord Hannay of Chiswick: Could you just say what is meant by a British shipowner? You say that you represent them, which is absolutely splendid, but I just want to be clear about how a British shipowner is defined.

Kiran Khosla: We do not actually represent British shipowners.

Lord Hannay of Chiswick: I am sorry. I thought you said you did.

Kiran Khosla: Our membership includes the UK Chamber of Shipping, and this represents a individual shipowners registered in the UK and/or flying a UK flag. We represent national shipowner associations. We are an “association of associations”; I think that is the way to put it. So for example we have the UK chamber, the Japanese chamber, the French shipowners’ association; they are our members.

Lord Hannay of Chiswick: Thank you very much.

Colin Manson: I am Colin Manson from the Manson Oceanographic Consultancy. I am an independent consultant. About three and a half years ago I retired from the Royal Navy, where I had been an environmental impact adviser: that is to say, I advised on the impact of the environment on us, rather than the other way round. I worked in particular for the

5 Note by the witness: The national shipowner associations are the official voice of the shipping industry in their respective countries. The members of these national associations are the individual shipping companies that are registered in that country and/or their ships fly its flag. They include operators of all types of ship (for example, container ships, bulk carriers, oil/chemical/product carriers, passenger vessels), and cover all types of trade. The national shipowner associations are members of ICS. ICS represents the national associations at the international level, speaking on their behalf in international fora such as the UN and its agencies, most particularly, the International Maritime Organization (IMO) in London but also UNCTAD, UNCITRAL, WTO, OECD. ICS has currently 34 national shipowner associations, representing shipowners from all parts of the globe.
strategic defence and security review in 2010, when I first became particularly interested in the Arctic, although I have had an interest in it for a long time. I have also dealt with a lot of the issues involving the Arctic: ice melt, climate change and sustainability. I also represented the Institute of Marine Engineering, Science and Technology on the IMO Polar Code working group for about three years, and I have continued to provide advice along those lines.

**Dr Martin Stopford**: I am Martin Stopford. I am the president of Clarkson Research. I have spent all my life as a shipping analyst and maritime economist. I have written a book that is quite widely used around the world for analysing shipping. I retired from the Clarkson PLC board two years ago and am currently non-executive president of the research operation.

**Q64 The Chairman**: Thank you very much. Perhaps I can start the questions. How realistic, in your view, is the prospect for a significant increase in trans-Arctic shipping, how might the prospect for transit shipping differ from the potential for an increase in destination-based shipping, and how are these currently split in terms of proportion? There is a lot of talk about the great opportunities for shipping, but is it overblown? We are thinking very much in terms of transit shipping, but are destination shipping, tourism shipping and assistance for mineral extraction vessels much more important? How does this situation look, and how will it move in the future? Who wishes to start?

**Dr Martin Stopford**: Perhaps, as the economic generalist, I could start. If you step back and look at the world that we live in today, opening up the Arctic sea routes would be extremely useful; it would fill a yawning gap in the transport system. Today, most of the heavyweight economic activity is in the north Atlantic, and clustered round the South China Sea. The big trades are east-west trades, making use of the Suez Canal and the Panama Canal, which give us a link between the oceans. There is a second access route around Cape Horn and the Cape of Good Hope, but at the moment any economic activity north of the critical mass of
activity in Europe and North America is a long way from the international markets. Ships have to do a sort of dog leg to get round, and if this direct Arctic route could be opened up it would be extremely useful for northern economic activities and would balance the transport world.

Colin Manson: The Northern Sea Route is the one that is most likely to become active and open, as opposed to the other two routes through the Arctic: the North-West Passage, which goes across the top of America; and the great circumpolar route itself, which would pass more or less over the Pole. The latter is many, many years away from being even vaguely useful. The Northern Sea Route needs a season of a reasonable length—at least 60 days—before it becomes a viable transit corridor. A hundred days would be better. Some of the analysis that I have undertaken indicates that the ice is melting faster than the IPCC would perhaps lead us to believe, and by 2020 we may well have a 60-day window, or season, through the Northern Sea Route with no ice in it whatsoever. At that point—by 2020—the route will become particularly viable. The 100-day window will probably be in 2025, so it is a little further afield. That Northern Sea Route will represent a huge saving in time and emissions—the carbon footprint per tonne, if you like—but by 2020 there will be a good case for a significant increase in the traffic that goes along that route: the intra-polar transport that services fixed installations, mineral extraction, oil and gas extraction—those kinds of activities. I do not think it will be particularly affected by the opening up of the sea routes. The vessels will have to operate all year round anyway, so in the winter when the ice returns they will still need to have icebreaker capability. So I am not so sure that the internal Arctic transport system is really going to be affected that badly by the melting of the ice.
The Chairman: But is there not a synergy, if you like, in that the more accessible the Arctic is to vessels, the more can be done economically to establish mineral extraction or other economic activities? One perhaps causes the other.

Colin Manson: There will be an element of synergy between the two aspects in that you are likely to have local transport—i.e. spoke transport from the extraction capability to a port somewhere: a hub distribution system—but the volume of those minerals in the short to medium term, the next 10 years or so, will be fairly low. It is going to be the increase in bulk transport between the Far East and the EU in particular, and potentially east-coast America as well, that will really open up the sea route.

The Chairman: If you will excuse what probably seems to you a naive and simple question, when we talk about those 60 or 100 days, does that mean that ordinary vessels that would normally go through the Panama or Suez Canals could, without any modification, go straight through there, or not?

Colin Manson: The Polar Code and the regulations therein deal with non ice-strengthened vessels using that route.

Q65 The Chairman: Okay. We will come on to the Polar Code later on. Kiran Khosla, are your members excited about this opportunity?

Kiran Khosla: They are very excited. They have been encouraging their member states to be very active in all the discussion about the Polar Code. For shipowners it represents a great opportunity because the routes are shorter, so it represents a saving for them in fuel costs. Fuel costs are the largest operational costs for a shipowner, so that would be of huge benefit, but it will also be of huge benefit for the international community. Shipping is the most ecological form of transport in terms of CO$_2$ emissions for example. Shipowners are
trying to understand how the trade routes would operate and what the opportunities would be, but they are certainly very positive.

Coming back to your question about trans-Arctic shipping and destination shipping, trans-Arctic shipping is notionally very attractive, but we need better, or fuller, analysis of future trade projections for the Far East to Europe and the west coast of America, which I am not sure we have seen; ICS does not really get involved in that sort of activity. That remains to be seen, and presently there are more attractive routes at the moment for certain trades, such as through the Suez Canal, because you can get larger container ships through there now. Most commodities are carried on container ships now, and we are not really sure what the capacities would be for container ships going through the Northern Sea Route. We are just trying to assess what the situation would be, but in principle we are very enthusiastic and very excited about this.

We think though that destination shipping is going to be the area that will develop the quickest—and of course there is eco-tourism, which is also something to be aware of.

Q66 Lord Hannay of Chiswick: You have spoken about the technical aspects. Could each of you just say a word about political risk? I imagine that if we were sitting here talking about the huge advantage that would accrue from the opening of a Suez Canal, none of us would have any difficulty in talking about political risk. I wonder whether you could do the same about the Arctic.

Dr Martin Stopford: There is always an element of self-interest in these things. We have seen the type of risk that you mentioned—for example closure of the Suez Canal—over many years. That did not damage the canal’s role in the long term as a key route; it was an essential part of the world economy. I would like to think that there is enough self-interest to counter some of the political risk, and I can imagine, if you take the view of the
broadening global economy, which I think we are seeing today, that it would be very much in Russia’s interest to have a thriving maritime traffic along their coast. It would be good for transit, although there is quite a lot of local trade anyway: there has been up to 7 million million tonnes a year of local cargo moving there\textsuperscript{6}. But you should set against the obvious political risk, the benefit that it might very well bring.

**Q67 Lord Moynihan:** Can I press you on the economic case? You say that a lot of your members are very excited about the prospect of this opening up, but in reality is not the economic case unanswered yet? In other words, while there is a clear reduction in mileage to be covered, there are significant additional costs from reinforcement for ice, the use of icebreakers, the potential for Russian costs and charges in transiting their waters, and—further to what Dr Stopford has just said—the economic costs associated with insurance for political risk, which are likely to be high, particularly in the current climate. Have any of you done detailed analysis on what this looks like?

**Dr Martin Stopford:** Some analysis has been done. The Norwegians are particularly good at this. They have done a number of quite detailed studies. In one I happened to look at yesterday, the Suez transit costs for the ship were $135,000, so you have something to put towards your icebreakers. If you look at anywhere that is north of, say, Korea or Japan, you are saving 30% to 40% in sea days. Fuel today is at $600 a tonne, and we are moving towards a position where low-sulphur fuel on the high seas may cost up to $1,000 a tonne. As my colleague mentioned, this has changed the whole order of magnitude in shipping. Six or seven years ago the cost of the ship was much more than the fuel that it burnt on a voyage.

\textsuperscript{6} This 7 Mt figure relates to the peak reached in the late 1980s. By 2008 the volume had fallen to 1-2 Mt a year, ore, oil and gas exports and food imports ref: Ragner, Claes Lykke, ’Den norra sjövägen’. In Hallberg, Torsten (ed), Barents – ett gränsland i Norden. Stockholm, Arena Norden, 2008, pp. 114-127.
Today, the fuel costs two or three times as much as the ship, so the ability to save, say, a third of the voyage is very helpful.

One extra point is that the IMO has committed the industry to cutting its carbon footprint by 50% by 2050, if I remember rightly. Here you have one very tangible way of reducing the distance and the steaming days, so it is a quantifiable reduction. Every ship that goes round the northern passage is quantifiably reducing the industry’s carbon footprint.

Lord Moynihan: You have not taken into account the fact that the largest and most powerful icebreakers cost up to $1 billion and can take eight to 10 years to build. Each of these voyages has to have expensive icebreaker support, which needs to be factored into any economic analysis.

Dr Martin Stopford: We are hoping that the weather is going to sort that one out for us.

Colin Manson: Very briefly, the big issue at the moment is that the Northern Sea Route takes you inside a great deal of Russian territorial waters, but as the ice retreats further and further the route can stay outside them, at which point the Russians can no longer insist on icebreaker assistance when there is no ice. Therefore, as that ice moves north and the route becomes open in the 60 days that I was talking about, when there will be no ice, that is when the real economic costs will fall, because you do not need that escort.

Kiran Khosla: Very briefly, we absolutely agree with that point. It also worth mentioning that when the Polar Code comes into effect it will involve an examination as to whether icebreaker assistance is required. There will be vessels that can sail through the region without icebreaker assistance if they are properly classed, and we are already seeing more flexibility on the part of the Governments and the authorities in that region with regard to the costs of icebreaker assistance. Given the political system there, negotiations are much more difficult, but that is now changing and the companies operating icebreakers are
beginning to have the authority to be a little more flexible in their negotiations on costs, and we hope this will continue to improve.

**The Chairman:** Lord Moynihan will ask more about barriers later on, and Lord Oxburgh will ask about critical infrastructure. Lord Oxburgh and Viscount Hanworth also have supplementary questions.

**Q68 Lord Oxburgh:** I should declare an interest as the director of two small renewable energy companies. None of you has mentioned the weather, but the Arctic has a pretty fearsome reputation in that respect. Are you implying that modern shipping does not care about the weather and will not affect the use of these routes?

**Colin Manson:** No. I am actually a qualified meteorologist and weather forecaster, so the weather is dear to my heart, even though some people find my conversation boring because of it. The issue is that the regulations, the mandatory elements of the Polar Code, which I know we will come to later, look at how a ship needs to be prepared for adverse weather conditions and the way in which the weather will affect it, as well as the way that climate will actually open up the Northern Sea Routes. There are already elements in place to provide for the weather aspects, but it remains true now, and as far I can tell for the foreseeable future, that the weather forecasting and ice forecasting systems are not yet in place to support large volumes of ships going through that area. We need to take those aspects into account. I refer again to hydrographic charts, but that is a separate issue.

**Lord Oxburgh:** The implication of that is that if the weather is severe, the transit times are going to be longer, or is that not the case?

**Colin Manson:** Inevitably that would be the case, but when you are considering a difference in transit speeds of perhaps eight knots down to six knots, that does not make a huge difference. Where you can get up to, say, 18 knots and you then have to come back to six
knots, that is a problem. Within those transit routes, the likely transit speed is going to be fairly reduced anyway, so it is not going to make too much of a difference.

**Viscount Hanworth:** In reference to something Dr Stopford said, what is the motive for the adoption of low-sulphur fuel?

**Dr Martin Stopford:** It is really to clean up the pollution and the wish to remove sulphur from ships’ fuel so that it does not—excuse me, I have lost the right word.

**The Chairman:** Is it set out in the Polar Code?

**Dr Martin Stopford:** That is part of the issue. The industry has been going down a line for some considerable time now towards dealing with all the emissions from ships, of which sulphur is one of the most toxic.

**Lord Hunt of Chesterton:** Sulphur produces acid rain.

**Dr Martin Stopford:** Thank you so much. That was the phrase I was searching for.

**Viscount Hanworth:** Who are the protagonists of this pollution?

**Dr Martin Stopford:** The protagonists are many. It is interesting that the container shipping fleet has the same installed capacity as the German power generation industry. It comprises a big chunk of engine power and thus has very high emissions. On the whole, the fuel being used by shipping is the bit left over. The old bunker C is the bit of the barrel of oil that cannot be distilled any further. All the distillates have been taken off and you are left with the residues. Traditionally, those residues have been sold to shipowners cheaply. The shipowners have burnt them and thus have produced a lot of emissions. The aim is to get rid of the nitrous oxide and sulphur, and in due course the carbon monoxide that is being emitted: in other words, to clean up the whole act. To do that, it may be necessary to burn a distillate fuel or special extraction equipment will have to be fitted to the ship. That is very much an ongoing issue at the moment.
The Chairman: Perhaps we can come back to supplementary issues on the environment when we reach the questions on the Polar Code, even if they have not been listed, particularly if they make up part of the point.

Q69 Lord Soley: By implication, Dr Stopford, you and your colleagues have implied that the bulk of the shipping transport is going to be cargo from the eastern seaboard of North America and Europe to the Far East, and presumably Greenland as well, I would think. Can you tell us from your research what other shipping options there are? One of you has mentioned tourism. Is there very much after cargo on the list or is it essentially cargo?

Dr Martin Stopford: I did look through some statistics for the transits that were made last year. Some 71 transits were made, of which 14 were ships ballasting, so these were ships that were returning quickly to their loading zones because they did not have any cargo on board. Another six that were non-cargo ships repositioning, so quite a few non-cargo ships are going through the Northern Sea Route—I should stress that these are figures just for the Northern Sea Route. A lot of the balance was made up of various oil products in the form of gas oil, diesel oil and a very big cargo of LNG. Some 68,000 tonnes of LNG went through for the first time. A couple of big tankers of 70,000 or 80,000 tonnes carried condensates through. A positive feature of this route is that it can take big ships, which has been a great problem with the Panama Canal and was for many years a problem with the Suez Canal. Perhaps my colleague knows how big a ship could get through.

Colin Manson: I, too, have looked at the ships that transited last year. The largest ship that went through was a 112,000-tonne iron ore carrier, so quite large cargoes can get through. However, it is all cargo that is going through. A lot of shipping might go into the Arctic, stay around for a while for tourism reasons and then come back out, but very few passenger-type
ships are likely to go all the way through from east to west or the reverse. They will tend to go in for reasons of eco-tourism and then come back out again in the same direction.

**Q70 Lord Soley:** Can you tell me a little about the predictability of this? If I was a shipowner, I would be asking how confident I could be that my ship would get through and deliver the goods on time, given that there is uncertainty about the extent of the ice at certain times of the year.

**Dr Martin Stopford:** Using the same statistics, I looked at the number of transits made during each month of last year. The first transits started in June, when there were two. They were followed by 12 in July, 15 in August, 21 in September, 14 in October and four in November. So the season ran effectively from the end of June to the beginning of November.

**Lord Soley:** An operator must decide whether or not to put one its ships through the Arctic route on the basis of using only a certain timeframe in the window. I can see that it is an opportunity within the limited timeframe, but given that operators can use other routes during the rest of the year, why will they use Arctic routes?

**Dr Martin Stopford:** They are cheaper.

**Lord Soley:** Is it literally about saving money? It is the predictability that interests me. The sea ice might not retreat as fast as you think at a particular time of the year. How can you be sure that you are going to be in the right window to deliver your goods?

**Dr Martin Stopford:** A lot of the cargo is made up of oil products, which tends to be a very opportunistic cargo. The traders who deal with it are quite likely to look at what works. The refiners sometimes produce a lot of one product, which means that sometimes you can sell a product very well in, say, Asia because the price is high or vice versa. The traders work out the price they can buy and sell for and the transit follows if the transaction is profitable.
Colin Manson: I want to consider the window of opportunity. To start off with, there would be a little bit of ice that is still there or is starting to form again at either end of the window. Those conditions are for ships that have been ice-strengthened or that have some kind of capability in ice. But there will be an increasing window when there is no ice at all. I know you cannot say that weather is climate, because it is not, but climatologically speaking you will be able to look at the historical data and predict that next year there is likely to be a window that can be used. In that way, you can plan for the longer term. If it transpires that you cannot get through without meeting some ice, that is the risk which the owner has to factor in: suddenly he is going to need an icebreaker escort.

Lord Soley: I have a final question on this, and again it is on the unpredictability of the weather. I am fascinated to find out why an operator would use these routes because my memory is so conditioned by visions of the Arctic convoys of the 1940s. We saw ships toppling over because the ice snarled them up so much. Presumably modern ships can deal with that without incurring massive additional cost. Either they must be designed for the conditions or there must be a way of removing the ice quickly. I should imagine that de-icing is not a cheap option.

Colin Manson: I am going to have to refer back to the Polar Code, because there are elements in it that deal with the granting of a certificate to a ship to enable it to travel into the polar area. That certificate is dependent on a ship’s preparedness for travelling in hazardous conditions, so when they are required, ice clearance systems must be in place.

Lord Soley: What does ice clearance mean? Is it an additional cost?

Colin Manson: There are elements in the Polar Code to deal with how much ice can be expected and how much can be allowed for before it has to be cleared away using mechanical means, pneumatic means, heating systems or whatever it might be. There are
Clarksons Research Services, International Chamber of Shipping, Manson Oceanographic Consultancy – Oral evidence (QQ 63 – 80)

aspects of the Polar Code that will cover those issues. Without that being defined in the polar water operational manual for each ship, it will not be given a certificate. Without the polar certificate, the ship is not going to go into the Arctic anyway.

Lord Soley: It must be a disincentive to using that route.

Colin Manson: It is a disincentive, but the savings in time, costs, fuel and emissions will offset those additional costs.

Q71 Lord Addington: We are concentrating on this one area. I wonder whether there any other major shipping routes with variables of this kind built into them that must be considered. Can we see any compatibility with the polar route anywhere else, or it a totally one-off, new place?

Dr Martin Stopford: The shipping industry is quite used to working in ice. There are currently over 10,000 ships with some sort of ice classification, 2,500 of which are class 1A. On the more sophisticated vessels, that will include features like covers for the decks when there is a lot of ice. Also, the deck is designed so that the ice falls off, a point that was made earlier. About five to 10 years ago the Gulf of Finland was a big issue. People could see that the Russians were developing offshore oil in the White Sea and the Kara Sea. There was a big move on the part of the shipping industry to order ice-class ships, which would be class 1A vessels. The owners paid extra for them and were happy to do so, but it did not work out that well because there was not as much oil as they expected. However, they are still around and I think that is what the shipping industry is there to do. The industry looks very hard at these things.

Lord Addington: That was not really the question I was asking. I wonder whether there is anywhere else in the world that has any experience that we could draw upon so as to make a comparison of the different variables. It does not have to be ice; it could be variability in
the weather creating the problems that we all agree are going to be experienced for the foreseeable future, even if they do disappear after a period of time. Is there a major shipping route anywhere else that merits this sort of consideration?

**The Chairman:** Kiran, I believe that you would like to come in on this point.

**Kiran Khosla:** I will try. The Arctic is a unique area and the only other comparable area would be the Antarctic. There is an agreement in place that formed a model, as I understand it—I was not involved in the detail—for the Polar Code. The Polar Code has drawn heavily upon it, but the Antarctic does not have the same degree of trade and shipping patterns. I think the Polar Code is unique in that sense.

**Lord Hunt of Chesterton:** The insurance industry is familiar with extremely high risks. Another point to make vis-à-vis Arctic surveys is that all these ships are fitted with satellites and forecasting equipment so they can move around. You seem to imply that the level of technology is not that high, or that we are not using what we know effectively enough.

**Colin Manson:** Perhaps I may answer that question.

**The Chairman:** We shall move on to some of this later, but please do make a brief response at this point. I am sure that Lord Hunt will want to follow it up later as well.

**Colin Manson:** My brief response is that I think we are going to cover many of these issues anyway, but satellite coverage in the polar areas is very poor. It is not like it is in the lower latitudes. By the time you are above 75 degrees north, you are starting to lose accuracy on GPS signals quite significantly, and radio communication in those areas is poor. Lastly, the amount of forecasting of the weather runs at a fairly low level.

**The Chairman:** We are coming on to critical infrastructure right now.

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7 Correction by the witness: I said “Polar Code” when I meant to say “Artic Area”
Q72 Lord Oxburgh: You have been telling us about the amount of traffic using the Northern Sea Route in recent years, but the ICS position paper makes the general point that a good deal enhanced infrastructure is necessary. What do we need beyond what people seem to be managing perfectly well with at present?

Kiran Khosla: Perhaps I can come in on that. What we are referring to when we talk of critical infrastructure is the need to ensure that there are systems in place to allow shipping to operate safely and that they are sufficient and can respond to preserve the marine environment. Provision must also be made for safety of life, especially with the eco-tourism industry taking off in the region.

We have identified a number of aspects that really need to be addressed before we can conclude that the Arctic is a safe area. There is a problem, for example, which has already been touched upon, about the lack of up-to-date hydrographic charts. The region has not been mapped for many years. We need better and more accurate mapping of ice movements, which we do not have at present, and satellite communications systems need to be put in place. These are all aspects that are either identified or dealt with in the Polar Code. Looking at the documents, I see that this also refers to extended periods of darkness, which can affect navigation and human performance; there are seafarer training issues with ice handling and so on; systems must be put in place to provide for adequate crew training.

Lastly, and what is probably most important, is the need to put emergency response provisions and measures in place. If there is a pollution incident or a collision, especially one involving a vessel with passengers on board, we need to be able to get a swift and sufficient emergency response out there. Those are all aspects that are the responsibility of the coastal states in that region, as they are in other regions. I have cited just a handful of the issues that need to be addressed.
Clarksons Research Services, International Chamber of Shipping, Manson Oceanographic Consultancy – Oral evidence (QQ 63 – 80)

Lord Oxburgh: Thank you. The coastal states are going to have to pay for all this and it will be quite expensive. Clearly training and so on is not the responsibility of the coastal states, but search and rescue, hydrographic mapping and things of that kind will be. How is this going to be co-ordinated and who is going to pay for it?

Kiran Khosla: The coastal states have obligations under international conventions such as SOLAS to make sure that these provisions are in place, and they really do have to comply with their obligations. But what we do see as an industry, and especially in the discussions on the Polar Code, is that there are proposals for the industry to upgrade ships in order to address these issues and to put on board better or enhanced equipment, such as lifeboats, and to make sure that there are charts on board. We are trying to make sure that the coastal states recognise that they have obligations under international conventions. There is in place a clear set of obligations which they have to comply with.

Lord Oxburgh: Who does anything about it if they do not?

Colin Manson: The Arctic Council already has systems in place for co-ordinating search and rescue elements. The different nations within the Arctic Council, the full members of the council as it were, have already made bilateral and multilateral agreements to ensure that search and rescue and oil spill response assets will be available. At the moment they are available for the current level of shipping, of course, but they would not necessarily be available for the full use of the Northern Sea Route when it comes into its own. It is those who have influence within the Arctic Council who will be able to push this forward as the Northern Sea Route develops. But inevitably there will be additional costs to transport. Any flag state will have to bear the cost of the improvements. As my colleague has said, shipowners are going to have to alter their ships. Mentioning the Polar Code once again, it contains mandatory regulations along with guidelines for improving those systems.
Lord Oxburgh: So the attractiveness or otherwise of transit through the north sea route is going to depend partly on extra costs for shipowners to fit their ships as well as on the rents extracted by the states through whose waters they pass.

Colin Manson: Through the waters and through the harbours that they use. Those costs will have to be recovered. That brings me to another bit of the critical infrastructure. Part of the Polar Code is going to restrict—in fact it is going to ban—the discharging of oily wastes in the polar area, even within the current limits of MARPOL. Vessels will need to have additional discharge facilities in harbours, which in turn will have to be constructed. That is also where additional costs will come in.

Q73 Lord Hannay of Chiswick: I think I am deducing from your answers that you are saying that the critical infrastructure issue cannot best be handled solely by the coastal states. You need some international dimension, and indeed you have talked about the Arctic Council and so on. Presumably the balance between the coastal states and international infrastructure provision will tend to shift a bit as more of the sea becomes open. Can you comment on how the balance is going to be achieved other than by a sort of hit-and-miss approach: that is, you find that something is not in place when you need it, there is a great flap about it and it is then provided. That is not very satisfactory, particularly in the case of an accident.

Kiran Khosla: I will try to answer that if I can. Perhaps I can cite one example that we have for the international community in relation to places of refuge. Places of refuge is an issue that is very much on the agenda for shipowners, because if there is an incident it is most likely that disaster can be avoided if a ship is able to go into a place of refuge, unload her cargo and make herself safe rather than remain afloat on the high seas and be subject to the perils of the weather. There is also the increased danger of a major pollution incident if the
condition of the ship deteriorates. The IMO has developed guidelines that require coastal states to put certain mechanisms in place in order to assess, when a ship asks for a place of refuge, whether that request can be accommodated. The guidelines set out certain criteria that must be looked at. Within Europe, those guidelines have been actively incorporated into the Vessel Traffic Monitoring Directive, which recognises that that sort of issue is of interest not just to the coastal state that receives the request but to neighbouring coastal states as well. If there is a ship-source pollution incident, it could affect the coastal environment of several states. Member states are required to co-ordinate and to have systems in place whereby they talk to each other, and I think they are working quite hard to improve their communications and co-ordination systems. It is a very good system. The model was in fact the UK SOSREP system, which has been seen to work very efficiently and would be a great model for the Arctic states. Taking on something like that would actually enhance their emergency response systems. It is a model that is well known and has been seen to work well. I can respond to the question by referring to that example. We would like to see the Arctic Council States, and the other interested states and the shipping industry consider communication and co-ordination at that sort of level.

Lord Soley: Perhaps I may press you a little further. You indicated earlier that some of the shipping increase might well be for tourism. I do not whether ships as large as the “Costa Concordia” would go up there, but if you had an emergency of that type, that would mean a massive rescue operation. How would it be mounted? It could be an incredible risk, could it not? When we look around the world we can see that there have been a number of big disasters and even countries that are quite well equipped to deal with them have encountered problems.
Colin Manson: That is going to come down to the individual national application of the regulations and to the training regimes that are put in place and enforced. The ships that go up into the Arctic area, and indeed to the Antarctic although that is outside this subject, will have to have certification to enable them to go into the polar areas. Moreover, that certification will be dependent on the level of training of the crew and the additional life-preserving systems that are put in place for such an event. If there is a loss, a grounding, the vessel getting stuck in the ice or whatever it might be, there are going to need to be enforcements by the various national state flag authorities around the world. That can come about only through agreement in places like the IMO, but also in conjunction with the Arctic Council, to which the UK is a visiting member, putting pressure on the local area—the coastal states of the Arctic—to ensure that sufficient assets have been put in place to deal with the increasing traffic.

Q74 Baroness Browning: Regarding the need for investment in infrastructure, not ships but in port facilities and so on, is there any indication that there is a great deal of interest by the Chinese in that area?

The Chairman: We shall be glad to hear from whoever wants to take the question.

Dr Martin Stopford: Most of it would be—

Baroness Browning: Surely the Chinese are not investing in Russian territory.

Dr Martin Stopford: I should have thought not, no.

Kiran Khosla: I think that China has established some sort of think-tank, if I can call it that, to look into the viability of the Northern Sea Route as a trade route, but whether that is buying into it in the same way as China has been seen to be buying into other regions, I am not so sure. It goes back to the points I raised in relation to trans-Arctic trade. I am not sure how attractive this actually is for China, because its future projections for development seem to
be focused on the southern hemisphere. The point is a very interesting one and I think that China’s role in trans-Arctic trade will be crucial. But what level of interest the Chinese have in it at the moment is, I think, open to question.

**Baroness Browning:** I was thinking more of the geopolitical incentive.

**The Chairman:** We are particularly interested in regulation and governance in this area. Is one of the approaches that agreements such as SOLAS and MARPOL need to be modified to have specific Arctic clauses in them rather than inventing something completely new?

**Colin Manson:** Perhaps I can address that question. The Polar Code regulations are in fact an adjunct to SOLAS, MARPOL and other current international instruments. The regulations have been developed in conjunction with all the different regulations overseen by the IMO. The Polar Code itself is not really a standalone, or separate, document; it will be an adjunct to the existing instruments and will be applied through them.

**The Chairman:** That is very useful, thank you.

**Q75 Lord Moynihan:** You have touched on a number of issues, which I would like to ask you about in a moment, but can I press you on the last question as well? I was under the impression that China, strategically and commercially, took a very high level of interest in what is happening. The very fact that it has 20% of the Yamal LNG project, that CNPC has recently signed a contract for 3 million tonnes of LNG from Siberia, and that it is in a joint venture with Mitsui to build three LNG carriers equipped with icebreakers seems to me evidence that it has this potential market very high on its strategic and commercial radar screens. Maybe you would like to comment on that.

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Comment by the witness: Current information suggests that China’s interest at the present time is in “destination” shipping to the region, for example, to facilitate the servicing of extraction of important energy resources from the area and transportation of those resources from the area.
Let me come on to the substantive issue that I wanted to question you about. Are there any additional environmental factors that you believe limit the potential growth in Arctic shipping? Allied to that, will further issues such as insurance, licensing and permit requirements limit the competitiveness of Arctic routes? You have already commented on many of the issues relating to that, such as the winterisation process, the ice navigation radar systems, arrangements for pipes to be heated et cetera. All those are additional costs, and there are key environmental issues that drive those costs. A lot of what you have said on this subject is that work is being done, that there is important further work to be done and that we are not there yet. Does that mean that you are not satisfied at the moment with the certification process for the current trade, which is principally destination shipping? It seems to me that we have talked a lot about transit shipping, but destination shipping, today and in the immediate future, is what it is all about. Are you completely comfortable that all the ships that are certified at present for work in those Arctic conditions meet the necessary certification requirements to avoid any serious disaster or incident, or do you believe that in this unique environment there are real concerns that we should share about the level of preparedness for Arctic conditions, particularly in the context of the environment, under the current certification process?

Colin Manson: I shall address that. It has been recognised that the current regulations laid down in SOLAS, MARPOL and all those other instruments are not sufficient, but while there was very little traffic and very few ships in the Arctic it was seen as the elephant in the room. We now know it is no longer viable to keep going down that route and that we need to introduce additional stringent measures. Again, the Polar Code addresses a lot of those environmental issues. The Polar Code is divided into two parts, the safety part and the environmental protection part, and the IMO working group believes very strongly that we
Clarksons Research Services, International Chamber of Shipping, Manson Oceanographic Consultancy – Oral evidence (QQ 63 – 80)

need to get these additional measures into place. Modifications to the hull, modifications to life-saving equipment, the restriction on what you can and cannot discharge overboard and where you can and cannot discharge it overboard are all addressed in the Polar Code. One reason why it is taking so long to bring the Polar Code into being is that we are trying to get those elements pinned down sufficiently to deal with environmental concerns but loosely enough so that shipowners are not going to incur huge costs, when then reduce the viability of the sea route in the first place. That balance is being struck in developing the Polar Code. It addresses all those environmental issues, and a large number of vessels will never be allowed into the Arctic because they are not going to be able to meet those regulations. The IMO is addressing those issues.

Lord Moynihan: But at the moment are there many ships currently operating within the Arctic that will not meet those regulations and that therefore provide an unacceptable risk?

Colin Manson: They meet the current regulations.

Lord Moynihan: Which you are arguing are insufficient.

Colin Manson: I am saying that they are insufficient.

Lord Moynihan: And a serious risk as a result of being insufficient?

Colin Manson: There is a risk, which I am sure is being dealt with by the various owners, the insurance companies and others, but I think the ICS will be able to answer that much more clearly.

Kiran Khosla: I am not sure that there is research showing that they are operating in a risky manner. What we are trying to achieve with the Polar Code is to ensure that the standards that ships operate according to are global or at least accepted by the community and are based on risk that is actually there. At the moment, some of the Arctic states are attempting to impose their own national standards for ship operation and ship safety, such as the
requirements to sail in convoy with icebreaker assistance, when these might not always be required. We are trying to achieve a genuinely risk-based assessment and to ensure that the ships, having gone through that assessment, actually comply and can deal with the hazards that are recognised for the particular type of ship, particular type of trade and particular area in which they are trading.

Lord Moynihan: But you are worried that many of those ships do not do so today.

Kiran Khosla: I could not say that they do not do so today, because the number of ships that are trading there is quite limited.

Lord Moynihan: But not destination shipping. A lot of shipping that companies use is destination shipping.

Kiran Khosla: I think there is a lot of uncertainty about what the standards should be. The Polar Code would reassure us a little more that we have gone through an assessment process and that there is a recognised organisation that will certify that a ship is safe. All I can say is that there is uncertainty about what the standards should be for the region, and that is being addressed in the Polar Code.

The Chairman: Three Members wish to ask supplementary questions. I am aware of the time and our progress. Perhaps we could go through those questions quickly.

Lord Hannay of Chiswick: In an earlier answer it was said that a substantial increase in the use of the polar route would help the IMO to meet its 2050 emissions target. Does that mean that a rise in the use of the polar route might be so attractive in that respect as to exempt the vessels using from applying sufficiently strict standards themselves?

Kiran Khosla: I think I understand from your question that using Arctic shipping routes would enable ships to have lesser standards.
Lord Hannay of Chiswick: I think you said that the ships using the Arctic should consider limitations on all sorts of emissions from them, the use of different fuels and so on. I am asking whether, if an increase in shipping is going to be so beneficial to the IMO collectively, it will turn a blind eye to that sort of thing.

Dr Martin Stopford: I cannot speak for the IMO, but I think that the point being made is an economic one. At the moment, we are using a pool of ships that have been built for the Gulf of Finland and other ice areas and have ice-class standards that were set for those areas. I think my colleague might be saying that the Northern Sea Route could be a bit more hazardous in some circumstances, although there is no obvious evidence that that is the case. The new regulations are designed to dot the “i”s and to look for areas where supplementary standards are needed, but for many years the industry has had ice-class standards. The St Lawrence seaway and the Great Lakes, for example, ice up over the winter and have been a standard trading area for 100 years. So I do not think that the issue is the IMO turning a blind eye to the standards, because that is a matter for the regulators, for those who inspect the vessels and for those who build them. The issue is whether we can get an economic impetus that will make this route successful.

The Chairman: We will come on to enforcement later.

Lord Addington: I have a general comment. We seem to be jumping around and talking about international agreements, individual waters and everything else, but basically most of the time we are talking about Russia. Is there any consensus that Russia is prepared to take on, for instance, safety work or making standards? I would just like to clear that up, and you seem to be the right people to say how much they are playing the game. Are we expecting them to back up what has gone on?
Dr Martin Stopford: In these cases mention was made, I think very vitally, of China’s interest in LNG. These are very big infrastructure projects that we are talking about here, and when you look at the map there is not an awful lot along the route. The towns along the Northern Sea Route are tiny, so I would have thought that the most likely way to get the infrastructure for the sorts of things that we are talking about is in a project run by large organisations, which might very well be Chinese oil companies, which will undertake the whole funding of the project, including building terminals.

Lord Hunt of Chesterton: I am getting more and more steamed on this question of the current codes at IMO and ACAPs. You go to Singapore and the non-agreement on shipping is appalling. You go to the United States and it is much more restrictive on shipping pollution, as in China. One of the things I want your opinion about is whether, given the considerable disagreements at the moment between the different countries on the existing MARPOL regulations, there will be some qualitatively different attitude on the part of the countries in developing the Polar Code, because at the moment IMO is deeply split on many of these environmental issues.

Colin Manson: The companies using the Northern Sea Route in particular as well as the countries whose vessels are going through that area will have a large reputational issue to deal with, should there be a problem or a disaster of some sort. That, in my view, is likely to be the point at which something major happens. It is unlikely that these regulations will be enforced really strictly until something happens.

Lord Hunt of Chesterton: Exactly.

Colin Manson: This is one of those unfortunate areas where it is going to take a “Torrey Canyon”, for those of us who old enough to remember, before the regulations are in force with any real stringency. That, of course, is just my opinion, not a fact.
Lord Hunt of Chesterton: That is why you are here.

The Chairman: We will come on to enforcement in a minute. I would like to change the order of questions slightly. Because we are talking about the Polar Code in this area, perhaps I could bring in Baroness Browning and then come back to Viscount Hanworth when we get on to legal certainty.

Q76 Baroness Browning: Can you tell us when we might expect the Polar Code? Has an optimum date been mentioned? What difference do you expect it to make? Lastly, please could you explain how it is going to be enforced, and by whom.

Colin Manson: Having worked on the Polar Code inside the IMO for around three years, I can say that it is incredibly frustrating to see the slow progress that is being made. Originally, it was due to be completed around three years ago. The next deadline is in fact this summer, but on going through the regulation as it is written in the last iteration back in May, which was the last time the working group actually met, it is clear that there are still a number of optional clauses that need to be clarified. I therefore cannot see it coming out this year. However, there is a lot of pressure on the working group to find an agreement that will be acceptable to all the delegates by the end of this year, with the intention that it is put in place by the end of 2015, but that is only putting it out there. It then needs to be ratified by all the members. I am not sure how long that will take, but it will probably be two to three years, if not slightly longer—and I am being optimistic. The regulations should be put in place by the middle of 2015. A lot of work needs to be done by a number of the delegates within the working group to push for the date and get the regulations in place. They want them to be in place, and it is merely a question of trying to find expressions for the clauses that contain no ambiguity so that they can go into the rules. It is a matter of driving that process forward. A number of the national delegates, along with some of the NGOs and IGOs, are
pushing for the regulations to come into force as soon as possible, and it is not that other
delegates are trying deliberately to slow or delay the process because they do not want it; it
is just that we need to have clarity in the clauses that make up the document so that it
cannot be interpreted in too many different ways.

Baroness Browning: You have said that globally this is a unique concept. How is it going to
be monitored and enforced? Who will be responsible for doing that?

Colin Manson: It will be for the individual authorities that grant the certificates to allow
vessels to go into the area. If you are in the national waters of any of the Arctic states, they
will have the right to inspect.

Baroness Browning: Perhaps I may put one more point to you. Given the concept of the
freedom of the seas, which is well known and you will know as a former mariner in naval and
military circles, do you expect to get some push-back once this is in force from nations that
would regard it as a real push against the concept of the freedom of the seas?

Colin Manson: National rules always apply inside territorial waters. It is only once the
Northern Sea Route becomes clear of national waters—although defining what national
waters in that area are is another moot point—and vessels are outside of territorial waters,
then the port of departure and the port of arrival will know where the ship has gone. If it
travels through the polar area, those two ports should ensure that the certification is in
place for that ship to do so. They are the bodies that will carry out any inspection.

The Chairman: I think Ms Khosla wants to come in at this point.

Kiran Khosla: Yes. I am trying to remember what I was going to say.

Dr Martin Stopford: On a point of clarification, the legal responsibilities lie with the flag
state. Today, some 70% of ships are flagged out to Liberia, Panama, the Marshall Islands and
so on. They are the ones that sit in the IMO and have the legal responsibility for
implementing the IMO conventions for the ship. Then, as the ship sails into territorial waters, the port state that it has sailed into also has certain rather different legal responsibilities. The authorities can inspect the ship under the system set up by the industry, the port state control system, which really has been pushing back against the offshore flags. The port state authority representatives can inspect the ship for defects under, for example, SOLAS. However, I am not so sure that the things they would inspect a ship for are necessarily the ones that would affect the transit element. Indeed, the big question in my mind is whether Russia will sign up to this. Technically, you could ratify the convention without Russia signing up to it.

Lord Hannay of Chiswick: I should like to follow that up. I am sorry to be so ignorant about this, but is the Polar Code one of those international conventions that will come into force when a particular number of countries have ratified it, irrespective of whether other countries have done so? This is the Russian question. Could the code become customary international law when, say, 60 countries or whatever the minimum is have signed, or is it a code that everyone has to ratify, and anyone who does not do so is not covered by it at all?

Dr Martin Stopford: I am not sure that there is a difference. Generally the draft convention will include a timetable and a percentage of states that need to ratify it before it passes into law.

Lord Hannay of Chiswick: So it is one that falls into that category.

Dr Martin Stopford: They nearly all do.  

Lord Hannay of Chiswick: If the Russians did not ratify, it would still be in effect.

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9 Correction by Dr Martin Stopford: The Polar Code is one of the exceptions. It does not fall into this category because it is not a convention; it is a code of practice brought into force by an amendment to the existing SOLAS convention (a new chapter XIV), which was agreed in principle in May 2014.
Dr Martin Stopford: Yes, but of course it would not be in effect in Russia.

Kiran Khosla: The Polar Code is an adjunct to existing conventions. As I understand it, although I have to make a disclaimer because I am not involved in the detail, once the Polar Code is approved by the IMO it will come into force six months afterwards. It sits on top of existing conventions that are already in force. I think it would be fairly straightforward because it is largely applicable to shipping. Ships are governed by their flag states in terms of how they comply with the Polar Code and operations within the code.

Perhaps I may come back to an earlier question. ICS is a little more optimistic about when the code will come into force because there seems to be a real push not only by the Arctic states but by other states that are interested in trading in the area. They want it to come into force because that will allow ships to sail there, with certain assurances. There will be an intersessional group meeting at the same time as the next technical meeting of the IMO where this will be discussed in order to make progress on the outstanding issues. That is being done in the hope that it will be approved either by the end of this year or by the beginning of the next year, and it will then come into force six months later. My marine department has told me that the end date is 2016, but whether it will be at the beginning of that year or at the end depends on how much agreement can be reached at the October meeting, which of course is coming up quite soon. I shall have to come back on what it was that I forgot to respond to.

Q77 Viscount Hanworth: I think my question has in part been pre-empted and it may be for Kiran Khosla. As a precursor to the question, I should say that Colin Moynihan and I have heard it said authoritatively by a Russian that Russia does have clear territorial ambitions in

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Comment by the witness: The time in which the Polar Code will come into force after adoption at the IMO has still to be agreed. It may be 6, 12, or, 18 months from the date of adoption at the IMO.
the Arctic that extend all the way to the North Pole. This tends to be in contradiction to some of the assertions that we have heard to the effect that in general the Arctic nations do not have such strong ambitions. From what I understand, current shipping routes through the Northern Sea Route pass through Russian territorial waters and Russia is inclined to exercise strict control over the vessels passing through its waters. As the ice melts, there will be an opportunity for ships to pass at a greater distance from the Russian coastline, but they would still pass through the exclusive economic zone, if not through the regions that Russia claims as part of its continental shelf. Do you believe that in such circumstances Russia would still wish to exercise close control over the shipping? One might observe that the recent ICS position paper on Arctic shipping calls for greater legal clarity regarding the status of the Arctic waters. Can you characterise some of the current lack of legal clarity?

*Kiran Khosla:* There are issues not just with Russia but with Canada relating to the extent over which those states want to exercise control beyond their internal waters and territorial seas. The jurisdictional framework for international shipping for the international community is set out in the Convention on the Law of the Sea 1982. It seeks to balance the interests of coastal states, flag states and port states, and it does that by dividing up the oceans into zones. The starting point for a zone is the baseline, which is, as I understand it, at the point where the water shelves. The waters landward of that are the internal waters of the state over which the state has absolute jurisdiction. That is why when a ship calls into a port, it is actually within the internal waters of that state and therefore is subject to its national laws. Some 12 miles beyond that on the seaward side is the Coastal state’s territorial sea, over which it has sovereignty, but it has to exercise that sovereignty in accordance with international law and internationally accepted rules and standards. So, as far as shipping is concerned, especially in relation to pollution from a ship, any standards which the ship has
to comply with are usually set by its flag state, and which should be in accordance with international law and standards. A coastal state seeking to exercise control in that area will be required to do that in accordance with international standards. Beyond that, you have the exclusive economic zone, which is 200 miles beyond the baseline, over which the coastal state can extract or use the sea bed mineral deposits and fossil deposits for its own benefit. It has limited jurisdiction in those areas. Beyond that you have the high seas. So for ships that are sailing within a state’s territorial seas—this has reminded me of where I wanted to come in earlier—there is the concept of innocent navigation. As long as a ship is sailing through territorial seas, it is allowed to do so without fear of being stopped and without fear of having imposed on it any additional interruption. As long as it is engaged in innocent navigation, which is what ships are generally doing if they are trading normally, they are allowed to pass through these territorial seas. It is only when they call into port in internal waters that a coastal state will be able to board the ship and ensure that it complies with the national laws relating to pollution measures, ship criteria or whatever. But, again, they should recognise internationally agreed rules and standards because they are controlled by the flag state. That is the mechanism which the law of the sea has established to enable ships to trade through these territorial seas.

Where we have seen problems in relation to Russia and Canada is with the limited exemptions within the UN Convention on the Law of the Sea. States can exercise or impose standards greater than the international standards. One of those is in relation to ice-covered areas. Russia and Canada are saying that they are allowed to impose stricter standards than those set out in MARPOL or the other international conventions under the provisions set out in Article 234 of the Law of the Sea Convention. There are uncertainties, to which our position paper alludes. We need clarity on what is meant by “ice-covered areas” and the
extent of the ice so that a state can impose standards that are different from the international standard. Does the exemption allow a state to impose its own standards up to the economic zone or only within the economic zone? That is another question and we are not sure about it. Can it also be within a territorial sea or is it just within the exclusive economic zone? I have heard it mentioned that Russia is trying to take this even beyond the exclusive economic zone. Those are all issues that need to be clarified in order to know whether the standards by which we as an industry are operating will be sufficient. The flag states need to know too. We need to know whether what Russia is doing is lawful. There is a counter-argument from the United States to what is being attempted here using another provision of the Law of the Sea, which states that if you have international straits you have the right of innocent passage. The US is saying that that right of innocent passage trumps any rights that a state might have under Article 234 of the Law of the Sea Convention. These are things that we as an industry would like the international community to resolve, and thus provide us with clarity.

**Lord Hannay of Chiswick:** But who has the right?

**Kiran Khosla:** The US is not a party to the Law of the Sea Convention, although it has accepted it as part of customary international law. Norway or any other state that is interested in this can raise it, under enforcement measures in the Law of the Sea Convention, to the International Court of Justice, I think it is, where there is a dispute. I think there is also a commission that deals with boundary lines.

**Lord Hannay of Chiswick:** It is a tribunal in Hamburg.

**Kiran Khosla:** Yes, the International Tribunal for the Law of the Sea. When you ratify the convention you sign up to all the other provisions as well as to enforcement. It would be
another state that raised an argument against the rights that are being exercised in these areas.

**The Chairman:** So rather than the signatories coming together and saying, “This is what this means”, it has to be done in an individual context.

**Kiran Khosla:** They could do it that way as long as there was a clear understanding. It really depends on whether there can be agreement within those states. If not, it might be ratcheted up to the next level.

**Viscount Hanworth:** So there is plenty of contention then, but perhaps you can comment on whether Russia might be becoming less amenable to negotiation in view of current conflicts elsewhere.

**Kiran Khosla:** I do not think I am qualified to comment on that. It is difficult for me to do so because we just deal with the ship operation aspects, not the political situation. All I would say, though, is that Russia has been very well engaged in the development of the Polar Code and is very much engaged in the Arctic Circle community of states. It has very clear economic interests that it would like to develop, and there must be a recognition that it has to do that through co-operation and through the recognition of international communities’ rights.

**Viscount Hanworth:** So it is not going to cut off its nose to spite its face, you would say.

**Kiran Khosla:** I would be surprised if economic interests were not very, very prominent.

**Q78 The Chairman:** As you said, one of the areas of greatest uncertainty seems to be the Canadian North-West Passage and what are internal waters and what are not. Is there a practical outcome from that, or is it at the end of the day just a great thing for lawyers to earn lots of money out of but actually makes no difference. Will it make a difference in the next few years to getting on practically with shipping business?
Kiran Khosla: The issue with Canada is the way in which it has drawn its baselines. It has drawn straight baselines.

The Chairman: We went through some of that in a previous session. What are the practical effects?

Kiran Khosla: The practical effect is that it is claiming its right of jurisdiction over a greater ocean space, which has an impact on other states that require their ships to be allowed innocent passage. If that is through internal waters, they would have to seek permission.

The Chairman: I am trying to get at whether non-Canadian-flagged vessels have to avoid those waters because of that.

Kiran Khosla: Not at the moment, because the standards which Canada is imposing in those regions are no stricter than the international standards. But there is an issue as to what might happen in the future. That is where the concern is.

Q79 Lord Tugendhat: My question breaks new ground, I have to say. I wonder whether you could comment on how you think an increase in Arctic shipping might benefit the United Kingdom, whether you think there are differences between the degree to which the United Kingdom might benefit or not benefit and the degree to which other European states might benefit, and what the implications of all this are for UK national and commercial interests. I do not know which of you would like to kick off.

Colin Manson: I will address this first. I first addressed this issue in 2010 during the SDSR, mainly because I was looking at trade and how that would change, not just at military stuff. One of the issues for the UK is that the Northern Sea Route means that ships come down from north Cape round the top of Norway and down into the EU. It is then a matter of what their point of entry into the EU is. There are a number of places it could be. It could be Norway, Denmark, Rotterdam.
Lord Tugendhat: It could hardly be Norway.

Colin Manson: It could if they have reasonable links for the trade to move onwards from that point. But then there is also the UK. No one is going to come down the North Sea and go into London rather than Rotterdam, so from the UK point of view, if we wish to take advantage of vessels coming through the Northern Sea Route or the polar route in decades to come we need to ensure that we have an attractive point of entry to the EU for vessels to stop at rather than going all the way into some of the more congested areas: Hamburg, Rotterdam, places like that. Of course, they have a natural benefit in that they are already on the mainland of Europe. The UK is not, and we would need to move that cargo onwards. It would make sense for the UK to take advantage of that additional inbound, or even outbound, traffic around the Northern Sea Route by having an attractive port that large vessels would come into and that would act as a hub for the European distribution of cargo. How that would be done and where it would be I do not know, but places such as the north-east of England save large vessels a day’s sailing rather than going into places such as Rotterdam and will make an attractive proposition. At least, the analysis that I have gone through so far indicates that; perhaps my colleagues will be able to answer that question in more detail. From a UK point of view, to get that trade we need to have a point of entry into the EU that is attractive.

Lord Tugendhat: So we are talking about quite large ships. Are there any ports along the eastern seaboard that you think might be particularly suitable for this? One that comes to mind is Hull, but are there any ports whose depth of water and other facilities make them stand out as potential candidates?

Colin Manson: Hull is about the only one I have thought of, because if you come much further south you might as well go to Rotterdam. You have to be relatively far north. You
Clarksons Research Services, International Chamber of Shipping, Manson Oceanographic Consultancy – Oral evidence (QQ 63 – 80)

have to save the big ships that additional day’s sailing in order to make it viable for them, but the onward shipping system has to be in place to make it viable for the owners of the cargo to move it forward in a different way. I do not think that coming much further south than Hull is really viable. As I say, you might as well go straight across to Rotterdam. But of course to make that attractive you must have the infrastructure to move the cargo onwards, which means better road and rail links, the Tunnel of course, but also internal waters, or North Sea transport systems, and smaller ships to take that spoke from the hub.

The Chairman: Perhaps we could hear from you other two colleagues. Dr Stopford, could you comment on the UK?

Dr Martin Stopford: It is a difficult question. This is a long-term perspective. We are only scratching the surface in what has happened so far. The UK has a very good position in maritime services, law, insurance, shipbroking, information management—things like that. The issue here, I would have thought, is that any significant change will shake the tree a little, and we have to be careful that we do not lose our position by missing out to, say, the Scandinavians, who are taking this very seriously. I see this as a defensive issue that we need to watch. The reason for watching it is just to make sure that we do not lose market position on the service side.

Kiran Khosla: I represent the International Chamber of Shipping, and the members who have been really pressing for this have been the Scandinavian members. From the UK perspective, if I may I will go back to our UK chamber, ask them for their perspective, and come back with some comments in writing.

The Chairman: Yes, please do offer written evidence.

Lord Hannay of Chiswick: Your answer seems to me a very narrow interpretation of the question Lord Tugendhat asked. It implies that the improved trans-Arctic trade route would
benefit the UK only if the containers were actually landed in the UK, but presumably the UK economy could perfectly well benefit from it if they were landed in Rotterdam too and then transshipped. A rather wider interpretation, which I think Dr Stopford gave, brought in insurance and all the other services that we provide. It is not just a geographical question of whether we will be able to get these large container ships into a port on the east coast of the UK because that is of benefit to the UK. Is that not right?

**Dr Martin Stopford:** I think you are perfectly right. The issue is much broader; it is not simply geographical. I am not in a position to comment on insurance and all the other things, but I am aware of some of the more direct trade issues, which is why I answered the question that way.

**Q80 The Chairman:** We need to finish, but I will ask one more question. If there was one thing that you felt was really important for us as a Select Committee to concentrate on in our report, what, in one sentence, would you say that should be in the context of the subject that we have been discussing today? Perhaps I could start with Dr Stopford.

**Dr Martin Stopford:** I would say for the reasons I mentioned at the beginning that this is potentially a very good thing. If you look at the history of trade, it will balance up the world economy and it will help the northern economies to develop, which is excellent, but do not hold your breath.

**Colin Manson:** It is really important that the UK pushes hard in the international community to get the Polar Code installed as soon as is feasible but also takes a very active role inside the Arctic Council to develop additional support to the international search and rescue capabilities and disaster relief, so that the UK really does help in those areas. It might just be that we agree to reposition some of our assets into Norway’s waters, for example, if the
Norwegian search and rescue effort suddenly has to deal with an incident in the Arctic Circle. That kind of international agreement or co-operation is a critical element.

*Kiran Khosla*: As the international arm of shipowners’ bodies, we urge the UK to use its influence to promote global standards for a global industry. We have seen the problems with regard to the Law of the Sea Convention issues that I highlighted earlier. If the UK can help to direct that discussion towards global standards that can be measured and that are recognised, that would be very helpful.

**The Chairman**: Thank you very much indeed for giving evidence. We will produce the report in February next year. If there is anything else that you think we have not covered, please let us know. I am particularly interested in having any written evidence on future projections of volume and the legal side: port state control, flag states, who is responsible for what. That would be very useful to us. Dr Stopford, is that an area of yours?

**Dr Martin Stopford**: I do not think I can advise you on what will bring the Polar Code into force, but could try to look at some of the other issues.

**The Chairman**: It would be very useful to have a note on who is responsible for what in shipping that goes through this region. I bring public session to a close at this point. Thank you very much indeed, and thank you to the public who have attended and watched as well.
HE Nicola Clase, HE Pekka Huhtaniemi and Alan Kessel – Oral evidence (QQ 311 – 318)

TUESDAY 25 NOVEMBER 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Viscount Hanworth
Lord Hannay of Chiswick
Lord Moynihan
Lord Oxburgh
Lord Soley
Lord Tugendhat

Examination of Witnesses

HE Nicola Clase, Ambassador of Sweden to the United Kingdom, HE Pekka Huhtaniemi, Ambassador of Finland to the United Kingdom, and Alan Kessel, Deputy High Commissioner for Canada to the United Kingdom

Q311  The Chairman: Your Excellencies, Deputy High Commissioner, can I welcome you to the Arctic Committee of the House of Lords? This is the second session this morning. You should have received a copy of our interests as Members and an indication of the sorts of areas that we are going to talk about and ask questions on this morning. Perhaps I could ask each of you to briefly introduce yourselves and then we can go straight into questions, if that works. Perhaps I could ask Ambassador Clase to start us off and then we will move through.

Nicola Clase: My Lord Chairman, thank you very much for inviting me. I am the Swedish Ambassador, Nicola Clase, and I am now serving in my fifth year here in London. Thank you.

Pekka Huhtaniemi: Yes, my Lord Chairman. My name is Pekka Huhtaniemi. I am the Finnish Ambassador to the Court of St James’s and I am also in my fifth year here. As to my Arctic experience, I have never dealt with Arctic dossiers directly but of course I have followed with interest the developments in the high north.

The Chairman: Thank you.
Alan Kessel: Thank you, Chair. My name is Alan Kessel. I am the Deputy High Commissioner for Canada. I have been here for a year now. Prior to that, I spent about 10 years as legal adviser to the Canadian Foreign Ministry, which included areas of Arctic concern, particularly the extension of the continental shelf and dealing with issues related to Arctic sovereignty and security. Thank you.

The Chairman: Thank you, colleagues. Could I also remind you that we are being broadcast? To those that are listening, to state the obvious, obviously you are all Arctic Council members. Previously we had observers. Lord Moynihan, you wanted to start us off.

Q312 Lord Moynihan: Good morning. I would be very grateful if you could set out your current priorities in the Arctic region. To what extent have your policies and priorities been affected by growing international interest in the region in recent years?

The Chairman: Go in whichever order you wish to take it.

Nicola Clase: Sweden has a natural interest in the entire Arctic region being driven by a positive political, economic and ecological dynamic. Ever since the Arctic Council was founded in 1996, there has been a strong consensus that economic, environmental and social development must be seen as a single concept to create long-term sustainable development in the region. Continued Swedish research and education initiatives are something that we find essential if progress is to be made.

Our concrete priorities can be defined as: climate and the environment; economic development; the human dimension, which is improving the situation for the Arctic people; and ensuring that the Arctic remains an area of low tension. It can be seen in that context. Thank you.

Pekka Huhtaniemi: Yes, my Lord Chairman, the Finnish priorities are very parallel to what you just heard from my Swedish colleague. Finland regards herself as an Arctic country, although the whole country is not really Arctic. It does not look like an Arctic country in the south, but one-third of the surface definitely is very Arctic. Geographically, we are located as high in the north as Alaska but the climate is obviously milder thanks to the Gulf Stream. We think that we are an Arctic country, an Arctic nation. We believe we have capabilities and capacities to contribute to useful international co-operation in the Arctic region.

We particularly want to protect the Arctic environment. We hope and we think that we can give a useful contribution to economic development in the Arctic region based on the ideas of sustainable development. Like my Swedish colleague, we emphasise the wish that the
Arctic region could be kept as a low-tension area politically and militarily. The continued stability of the Arctic region is very much in our interest. This requires openness and cooperation among Arctic states. We have to take into account the interests of the people who are living in the Arctic areas, particularly the indigenous peoples. We have a Sami population in Finland, which is our indigenous Arctic population.

We think Finland can make a contribution to the economic opportunities that are offered by the Arctic region, because we have extensive knowledge and competence in certain areas like Arctic shipping, transport, logistics in those difficult conditions, meteorological technology, rescue technology and so forth. All this means that we are favourable to the development of the economic resources that exist in Arctic areas, as long as we take very good care of the requirements of the environment and sustainable development. These are perhaps the main priorities.

Has the growing international interest had an impact? Yes, because we have had Arctic strategies before, but they have been, let us say, narrower in scope. A new more comprehensive Arctic strategy was drafted by a Government task force last year, and that is now the basis of our policies in the Arctic region. I do not know if you are familiar with the Finnish Arctic strategy. If not, I have copies for you to submit. Thank you.

**The Chairman:** Feel free to distribute them after the meeting. Thank you, Ambassador.

**Deputy High Commissioner.**

**Alan Kessel:** Thank you, Chair. I know you have had the opportunity to hear from Vincent Rigby on a number of issues. I will try not to duplicate, but clearly he and others have said how dramatically the Arctic is changing. It is a testament to how our common vision comes out when you see the three of us saying very similar things. Let me just talk a little about the Canadian interest. Essentially, we have 104,000 Canadians who live in the north, whose interest we, as a Government, have to promote and protect. We launched our northern strategy in 2009—I am sure you have copies of that—and it clearly articulates our approach to what we are doing.

There are four interlinked areas that are of interest to us, focusing on the exercise of Canadian sovereignty in the north and dealing with the reality that, while the Arctic has been a protected area in the past, we are now seeing intrusions from areas in the south. To that end, we have been upgrading our level of coastguard protection and expanding our Arctic patrol vessels. Another example, of course, is that we are very much following the
requirement of the UN Convention on the Law of the Sea that we do an extension on our continental shelf, and to that end we submitted a partial submission as of last year. Of course, the recent discovery of the remains of the Franklin expedition also helps to attract attention. That has gained a tremendous interest not only in what we are doing but in how joined up Canadian and British history are—and we can talk about that a little more—as well as what, in fact, we can do together.

Other issues are, of course, promoting social and economic development, a theme that you have heard here already, and our environmental heritage. Part of the Canadian Government’s intent is also to improve the devolving of governance in the north. I point to the creation of Canada’s newest territory in 1999, Nunavut, and this followed largest land claim settlement in Canadian history. Of course, we are now developing province-like responsibilities for this territory.

In the broader Arctic region, our priorities can be summarised under essentially four headings. We are encouraging our neighbours to resolve boundary issues. We are securing international recognition for the full extent of our extended continental shelf. There is also Arctic governance generally, but the overarching issue is environmental stewardship. You have heard from us and certainly, I would hope, from other Arctic Council states that we are working to create, essentially, international conditions for sustainable development. That is essentially seeking trade and investment opportunities while promoting an ecosystem-based management approach with Arctic neighbours and others. I can certainly pursue this further with other questions, if required.

**Q313 Lord Moynihan:** Thank you for what is broadly a common vision. The Committee is very conscious that 50% of the Arctic region lies in Russia and that some 50% of the indigenous people, if not more, are Russians. Where do you see your policies and priorities differing from those of the Russians? Could you give some specific examples of that? Two of you spoke about the tensions that exist and the importance of recognising those tensions. Could you tell us what causes the tensions that concern you?

**Alan Kessel:** Those who mentioned tensions should maybe talk about the tensions.

**Pekka Huhtaniemi:** If I may start, my Lord Chairman, it is not a high-tension area at the moment, but we just hope it will not become one in future either. Obviously, however, when important natural resources are located in a certain area, it can lead to some sort of rivalry and competition for those resources.
Regarding differences in the approach of various countries concerning their indigenous populations, I know how we deal with that issue in Finland. The Sami population actively take part in local politics in the regions where they are living. They have their own Sami Parliament, which deals with issues of their cultural autonomy and tries to enhance their own cultural identity. I know that a similar parliament exists in Norway and Sweden—although not in Russia, as far as I know. However, there is the Sami Parliamentary Council, where these national Sami parliaments have their representatives, and that, I understand, includes some representatives from the Russian Sami minority, although they do not have a parliament of their own in Russia. There are differences in how the various countries are dealing with these issues, but it is difficult for me to speak very deeply about the practices of others.

**Nicola Clase:** I can only concur with the Finnish Ambassador. We see the Arctic Council as a big asset, and it is a major achievement that eight Arctic countries can sit together in an intergovernmental forum and discuss these issues, whether they are environmental issues or many other aspects. The work that is being conducted and now taken on by the Canadian chairmanship to continue to strengthen the Arctic Council is critical. The addition of observers is also critical, because observers can play a key role as well—as we have seen with the Committee taking this interest in the Arctic. We strongly welcome that, but there is so much more work to be done. That is very clear.

**Alan Kessel:** If I could just support the views of my Swedish colleague, if you take a look at the Arctic Council it is really a remarkable, visionary organisation that was created quite a few years ago in Ottawa. In fact, it has been the bedrock of our relationship within the Arctic region. It has allowed us to share views on where we wanted to go and how we get there. It has allowed us to know our neighbours in a way that we could not in very tense times back in the early part of last century. From its inception, it has done something no other organisation has done: it has included indigenous peoples as Permanent Participants—as members of an organisation that is based on building consensus around a table. In essence, we have done quite a bit to encourage that relationship between the states and also to allow, if necessary, those bridges to be crossed if and when we need to in more tense times. We have done quite a bit to maintain the integrity and security of a region that is of interest to all of us.
Lord Moynihan: Would it be right to conclude that there is board consensus between the three of you and the Russians at the moment on policies and procedures in the Arctic?

Alan Kessel: You say “in the Arctic”. That is a very general question.

Lord Moynihan: It is. I am very happy to hear specific examples where there is not.

Alan Kessel: Quite frankly, we sit around a table together. We have done so for many years. We continue to sit around a table together. We work by consensus, so by definition we are not voting. Unlike our parliaments, we are encouraged to come to conclusions together. We have been very successful up until now, and I expect we will continue to be successful. It is an intimate environment. It is quite interesting that you did discuss the issue of observers—maybe we will get into it in more detail later on—but that intimacy is a rather important thing that we created all those years ago. That intimacy allows for a capacity to talk to one another in a way that you would not when you are in a fishbowl.

Lord Hannay of Chiswick: Could I follow up on this point of security and tension? Obviously, you are as aware as we are that the relationship between Russia and the western countries has sharply deteriorated in the last year and that sanctions have been imposed on Russia as a result of its actions in Crimea and Ukraine. Could you tell us whether any of your three Governments have identified any spillover or increase in tension in the Arctic area as a result of that deterioration? If the answer to that is “no”, are you confident that that will continue to be the case? For example, if Russia were to block the EU’s application for observer status, would you regard that as a spillover of the tension?

Pekka Huhtaniemi: My Lord Chairman, I am sure the question of EU observership will come up in the next Ministerial Meeting of the Arctic Council in north-east Canada. It remains to be seen what the Russian position is. At least in Finland we hope the application of the EU could go forward and be adopted. If Russia decides to block that, one can of course speculate that the more general situation is behind this, but that remains to be seen. We have not seen acute expressions of new high tension in the Arctic in recent times. We hope it stays that way. That is why these co-operative platforms such as the Arctic Council—let us not forget the other one, the Barents Euro-Arctic Council, where we are all members; you are observers there as well—are important platforms, where the dialogue and co-operation hopefully can go on despite the tensions elsewhere. At least that is the sort of credo that we wish to voice regarding these co-operative arrangements—that they could continue as normally as possible, despite the tensions caused by the Ukrainian situation.
Nicola Clase: I would just add that dialogue, transparency, confidence-building measures and co-operation in line with international law in the Arctic area with the Russians is something we must pursue, and that can very much add to the goal of keeping it a low-tension area.

The Chairman: Does Sweden believe that potential harassment by Russian vessels recently potentially increases tension in the Arctic?

Nicola Clase: It is always wise to have an ongoing dialogue. In the case of the Russians, that is something we need to pursue. If there is something that happens that is not in conformity with how we see that things should be done, we should deal with it—and we should deal with it in a transparent way.

Alan Kessel: The issue of observership was raised and I just wanted to make it clear at least that, certainly from the Canadian perspective, as you will recall in July 2014 both Canada and the EU negotiated a declaration, a joint statement, on the access to the European Union of seal products from indigenous communities in Canada. Following the conclusion of the talks that we had with the EU, Canada lifted its objection to the EU’s application to be an observer at the Arctic Council, so we see no impediment from our point of view.

Baroness Browning: Did the recent announcement by the Russians of their plans to increase their military capability in the Russian Arctic by 2016 not cause some comment or tension within the Council? I know the Canadian Prime Minister was reported as having given quite a robust response to that announcement.

Alan Kessel: Our Prime Minister is on the record as to his views. I have not had personal experience in the council of the discussions on that. Maybe Mr Rigby could have filled you in on that and, certainly, if you need further information I am sure Mr Rigby could fill you in. However, I have no personal knowledge of those discussions in the council.

Baroness Browning: Does the council regard this announcement by Russia as being a proportionate response to their obvious right as a sovereign nation state to defend themselves? As it is specific to the Arctic, however, does the council regard that as proportionate?

Pekka Huhtaniemi: My Lord Chairman, I do not know if it has been deliberated on or discussed under the auspices of the council, so I simply do not have information on this particular point. Who knows? Maybe this will come up in the ministerial in April, but that is
still quite a few months away. We always hope that the sort of general tensions may be reduced by that time.

**Nicola Clase:** Can I just add something? The Arctic Council does not have a mandate to discuss military issues. We should remember that when we refer to the Arctic Council.

**The Chairman:** One thing I would just say is that obviously we are not just interested the Arctic Council. That may have been the framework of the question, but we are interested in Arctic policy generally, outside and within the Council.

**Q314 Viscount Hanworth:** How should economic and industrial developments in the Arctic, including oil, gas, mining and shipping projects, be balanced with the need for environmental protection? How does the perception of the appropriate trade-off vary among Arctic nations? How do the ways they propose to manage it vary? I would indeed like to have comments on the perceptions and practices of others. Even though there may be a consensus among you, there may be others that differ.

**Nicola Clase:** The real issue is how we manage economic development so that commercial advantage is not gained at the expense of the life of the indigenous people or environmental destruction. This is very much echoed in the Kiruna declaration from 2013, which stresses the importance of the sustainable use of resources and environmental protection and commits to strengthen efforts to diminish the negative effects of climate change on the fragile Arctic environment. It is critical that we get regulators, Governments, policymakers and administrators working together to create the conditions in which Arctic development can be safe, environmentally sound and sustainable. Here the Arctic Council has an important role as a platform in raising awareness of these issues. The council could promote best practices and this could also be a task for the newly established Arctic Economic Council.

Sweden very much promotes greater use of environmental impact assessments in the Arctic: for example, in the mining, shipping and oil extraction industries. We see it as important that especially sensitive areas should be protected from exploitation, and the reports produced by the Arctic Council should focus on increasing the level of protection.

We did have agreements on oil spills and search and rescue enter into force during the Swedish chairmanship, and we are very pleased that recently the IMO adopted the international code for ships operating in polar waters—the so-called Polar Code. That is going to be mandatory and should enter into force at the beginning of January 2017. During
HE Nicola Clase, HE Pekka Huhtaniemi and Alan Kessel – Oral evidence (QQ 311 – 318)

the Swedish chairmanship of the Arctic Council, Sweden introduced the concept of corporate social responsibility in the Arctic and arranged for a conference on Arctic shipping in London, which took place in March this year. CSR is a concept that also could be further developed in the Arctic.

Viscount Hanworth: Could I give you back your own words? You said that this economic development should not be at the expense of the environment, but invariably it will be. Perhaps there are opinions that there should be moratoria on things like fishing and mining, which some of you are proposing it and others are opposing.

Nicola Clase: We have to look at both challenges and opportunities. It is easy to say that we should not be doing anything in the Arctic, but that is not realistic. But when we do things, we should do them in a sustainable way. That is what we should be focusing on.

Pekka Huhtaniemi: Yes, my Lord Chairman, this very much coincides with the Finnish approach. It is often said that Arctic nature—the Arctic environment—is particularly fragile. I think that is generally accepted. Usually, in other parts of the world, nature heals itself easily, but in the Arctic regions, for obvious reasons, that does not happen very quickly if there has been a heavy intervention. However, the economic opportunities are really considerable in the Arctic regions. There are these possibilities regarding mining, oil, gas and shipping. More road and rail links will surely be needed. Tourism is going to be, I am sure, of some importance—maybe of major importance to some parts of the Arctic. We just have to be somehow able to develop or exploit these possibilities, but crucially always bearing in mind the environmental fragilities and trying to work on the basis of principles of sustainable development. This is very much the guiding philosophy or approach in the Finnish Arctic strategy that I was talking about earlier.

Alan Kessel: Chairman, you will be hearing the refrain often, which we all share, that since the establishment of the Arctic Council one of its pre-eminent objectives has been a commitment to sustainable development. Sustainable development has evolved since we started and has become a guiding principle and an economic reality in a very difficult environment. We, Canada, are committed to responsible resource development in a manner that balances economic, social and environmental imperatives. This is very much consistent with our northern strategy, which is also consistent with Canada’s position as Arctic chair. It is very much a seamless transition from the Swedish chair, and there will be, in a way, as you see the Americans come on board, another seamless transition. There is a
theme of continuing to build for our communities. You mentioned the Kiruna ministerial. The agreement on co-operation on marine oil pollution, preparedness and response in the Arctic is a very interesting development, because we now have, together with search and rescue, two binding documents, which changes the nature from our non-binding discussion group into a much more norm-setting environment. For those of you who are looking for an evolution in what the Arctic Council has been doing and what we in the north have been doing in relation to changes in the environment, we have gone from the development of and then talking about binding instruments.

Under Sweden’s Arctic Council chairmanship, the eight Arctic Council members at Kiruna launched a new task force on oil pollution prevention to develop an action plan to be presented to the ministerial meeting in April 2015. We are all very much aware of the Gulf of Mexico BP experience—nobody in their right mind could not be—and to address some of these things, in Canada we have developed a comprehensive off-shore drilling review undertaken by the Canadian national energy board, which has resulted in a new Arctic offshore oil and gas regulation. That will, in fact—and we are very proud of this—ensure that the Canadian Arctic region is subject to one of the most robust oil and gas regulatory regimes in the world and that we are sure that the board has the necessary tools in place to protect the safety of workers, the public and the Arctic environment.

Maybe to toot our horns just slightly, 40 years ago in the 1970s—it is hard to believe—we were rather innovative in coming up with what we called the Arctic Waters Pollution Prevention Act, which was considered quite extraordinary at the time. Some people still consider it extraordinary. We consider that Act, which extends our jurisdiction out to 200 nautical miles within our EEZ, to apply an environmental regime within our waters, without extending to the high seas. In fact, we have consistently put a challenge out there to other Arctic states to emulate that legislation, which we consider rather visionary.

Pekka Huhtaniemi: If I may, Lord Chairman, I will just add a point about the Polar Code, which my Swedish colleague mentioned. That is an important new instrument in the making, which is supposed to tackle the important issues that are looming on the horizon in the Arctic region. That work is being done here in London at the IMO, as you know. It has been important that the IMO has been able to have links with the Arctic Council. The Secretary-General of the IMO has been able to explain to audiences in the Arctic Council what is really going on at the IMO regarding maritime disciplines. I think here that some of
our countries that are located in the Baltic sea region have a knowledge and know-how about somewhat similar issues, because we are facing the same kind of situation where, during part of the year, maritime transport has to take place through very icy Arctic waters. The Baltic Sea is also a fragile maritime environment. Our experts have been able to contribute usefully to the work of the Polar Code, which I understand is now reaching its final stages. I guess you will also take evidence from the IMO regarding this particular issue.

**Viscount Hanworth:** I believe that there are substantial differences of opinion among Arctic states on this business of whether a balance can be struck between economic and environmental issues, but we have not managed to extract any of that from you. If you wish to heighten these differences, I would be interested, but I can understand if you want to judiciously ignore them.

**The Chairman:** I think we have gone through probably as much as we need to at the minute, because we need to move on to Lord Soley. Thank you, Viscount Hanworth.

**Q315 Lord Soley:** I wondered if I may turn to the indigenous people again. You have all spoken about that and we have met and talked to representatives of the indigenous groups. Obviously there are good and bad examples of economic development, and I will come to that in a moment. I am trying to get an idea of the overall feeling of some of the indigenous groups—the Inuit, the Sami and others. Are they really welcoming economic development? In others words, if you took a poll or a vote among them, would they be saying, “Yes, we are really pleased about economic development taking place in the Arctic”, or would they back off and say, “No, it is interfering with our traditional way of life”. We will turn to specific examples of good and bad in a moment, but I am trying to get an overall feel of what indigenous people want. Perhaps the Ambassador for Sweden could start on that. I know you have given some thought to it, as I am sure the others have too.

**Nicola Clase:** Lord Chairman, can I first start by commending the Canadian chairmanship? They have been excellent at addressing issues relating to indigenous people in the Arctic. That has been a main priority of the Canadian chairmanship, which we think is very important. The well-being of all Arctic people is fundamental as the Arctic region develops, but it is very important to acknowledge the importance of indigenous people’s traditional ways of life to their economic well-being, culture, health and language. The basic prerequisites for the people living in the Arctic is that there are opportunities for them to earn their livelihood and that there are good communications, social care et cetera. But how
local and indigenous people benefit from economic opportunity depends on where you find yourself in the Arctic. The challenges are not necessarily always Arctic specific but similar to regions—areas with scarce population and limited communication.

As was stressed by my Finnish colleague previously, we have a Sami population in Sweden, and there is very close co-operation between Finland, Norway and Sweden, with Sami parliaments where you can discuss a lot of these issues. There is also a presence in the Arctic Council. Many of the issues that relate to indigenous people can be raised. The fact that the Canadian President is taking a broader approach to this issue is very helpful.

Lord Soley: Can I be clear? Your answer is that broadly the indigenous people in Sweden would welcome more development in the Arctic. Is that what you are saying?

Nicola Clase: If you look specifically at Sweden, if we look at the mining industry, which is a key industry, 90% of the iron ore produced in Europe comes from the northern part of Sweden. There is a Sami population in the area. There is a very interesting project going on. There is the city of Kiruna with 23,000 people. Thirty-five per cent of the city now has to pack its bag and move down the road in order to continue with the mining, otherwise they cannot continue. The contribution to the Swedish economy from the iron ore industry is such that it would not be possible not to continue mining. But there you have a very good discussion. It is not only to do with the indigenous people but with the population of this town. As an example, with reindeer herding, they came up with this project that meant they could continue that in a way that was conducive to continuing the way Sami herders have traditionally done things. It is very much a dialogue.

Pekka Huhtaniemi: In my previous statement, I have already told you about how the Sami population is given a voice in Finnish politics and decision-making. That is an important aspect: that they can, at least, express their pre-occupations, their worries, their interests, and that they are also heard by those who take the ultimate decisions. I have not sensed any sort of opposition for principle reasons against economic development projects in the Finnish high north. What has mainly been happening there is mining projects and then tourism development projects. They are important sources of livelihoods and jobs. I think the Sami population accepts that, as long as their traditional culture and economy based on reindeer herding is protected and they can continue also to get their traditional livelihood the normal way.
Lord Soley: Your view is, again, that they are broadly supportive, bearing in mind that there are good and bad examples.

Pekka Huhtaniemi: That is my sense broadly. We have not had violent protests, which we have seen in some other countries in the past decades, concerning some economic development projects.

Alan Kessel: It is a really superb question, because it does highlight how different and varied the Arctic is. Some people talk about Africa as if it is some homogenous thing—you know, “I went to Africa”. Well, “Congratulations”. “I went to the Arctic”. “Congratulations, too”. It is all so different. The beauty of your Committee is that you are digging into some of the texture of that. Part of what you are doing is educational, and we are delighted to be here certainly on that level.

The thing I would point out is that all these areas are part of our countries, as the Hebrides are part of your country. It is as much part of downtown Toronto as it is Iqaluit. Having said that, clearly areas require different approaches. Our Prime Minister, when looking forward to the Canadian chairmanship of the Arctic Council, made a very deliberate decision. He said that if our theme is going to be development of the people of the north, then we have to engage those people in the north. He appointed Minister Aglukkaq as the Canadian proposed Chair of Arctic Council. She is a Member of Parliament, she is an Inuk, she is from Gjoa Haven, Nunavut, and she is the Minister of the Environment. You have the food groups there that are key to promoting that holistic approach to our Arctic. When we did extensive consultations regarding our Arctic Council chairmanship, we heard time and time again from indigenous contributors about the need for more concerted development but done with those key issues in mind.

The flagship initiative of the Canadian chairmanship of this period of the Arctic Council has been the creation of an Arctic Economic Council, because people want to be self-sufficient. It held its founding meeting in Iqaluit, Nunavut in September 2014. Permanent Participants have representatives at the Arctic Economic Council, which ensures that indigenous people and their expectations and concerns regarding sustainable development are incorporated into the mandate and work plan.

Unemployment in some of these areas is endemic. When you have the opportunity to raise the standard of living and provide skills and jobs to people, as the Government it is incumbent on us to do that. An example is the Agnico-Eagle gold mine at Baker Lake, which
took unemployment in the community down from over 75% to 5%. It also gave skills and a future to people who had not had some before.

At the same time, we want to ensure that there is benefit to northerners in a vast area of disciplines. To that end, we have pumped a large amount of money into the Canadian High Arctic Research Station. It is going to be one of the signature deliverables of Canada’s integrated northern strategy, and the construction of that station started last summer, with 80% of the workers employed in the local community of Cambridge Bay. Other job opportunities will flow for local people when the station becomes operational. I cannot overemphasise the integration between the local interest in improving sustainable development in their community, while at the same time bringing decision-making down to a local level and putting people in charge who have an interest in and who live in and come from that area. We have been quite successful in doing that.

The Chairman: Lord Soley, I am going to have to move on.

Lord Soley: One more very brief one again to the Ambassador for Sweden. A bad example I have heard about—and I do not know whether it is true or not—was Beowulf Mining in Sweden, which is a British company. Do you know anything about that, and would you regard it as good or bad, or not?

Nicola Clase: I am not familiar with that company.

Lord Soley: I will leave it there.

The Chairman: With Lord Addington’s permission, I am just going to move on to the final couple of questions, which I am going to put together because of time constraint. I would therefore like to ask you what role observers should play in the Arctic Council, whether there is an optimum number of observers and when that limit might be reached. Within that context, what do you see as the areas in which the UK can work with Arctic nations and what are the strengths that the UK can offer? I am going to ask, Lord Soley, if you could just take over the chair temporarily for five minutes for me. If I could ask the ambassadors to continue on that, I will be back.

Lord Soley: The music stops and I am here.

Q316 Lord Addington: My question is about how the decisions made within the council are implemented within the individual states themselves. We are trying get at how this comes down to the individual actions of those who have the power to do it. How does the council strike an effective balance between long-term goals, which are probably shared by the entire
council, and the fact that you have these two-year rolling chairmanships? How have you managed to square that eternal circle of long-term goals and that particular bit of leadership and that particular bit of ground here?

**Nicola Clase:** My Lord Chairman, just briefly, most of the recommendations and agreements that are reached in the Arctic Council will be implemented nationally. In Sweden, it would generally be by a governmental agency with specific competence in that area. When it comes to looking at long-term goals, the Swedish contribution was the long-term document *Vision for the Arctic* that I am sure you have all come across. That was adopted at the Kiruna ministerial meeting in 2013. This is a rather short and highly political statement on how the Arctic states and indigenous groups would like to see the future of the Arctic.

**Pekka Huhtaniemi:** Yes, my Lord Chairman. The basic rule is that the Arctic Council makes recommendations to member countries and decisions concerning only its own activities. Then these recommendations are dealt with at the national level, as my Swedish colleague just explained. Long-term goals are obviously very important, because some of the issues that are relevant in the Arctic are, indeed, very long term, like climate change, which is an overarching aspect or issue. We believe that the rotating chairmanship system that we have is positive and that it tends to emphasise continuity. When a country assumes the chair of the Arctic Council, it is a situation whereby you really have to take a broader view rather than simply a national view on things. It tends—we hope, at least—to increase the ownership concerning the various policies and long-term orientations that have been adopted. We generally find the rotating chairmanship system conducive in this regard.

**Alan Kessel:** Chairman, I will try to be brief on this one. I cannot disagree with anything that my colleagues have said and, frankly, we share exactly that view. This is how it works: recommendations come out of the Arctic Council and, to the degree that they are relevant within our jurisdictions, they are applied by domestic law or regulation. The one thing I did want to chat about again is in reference to my earlier comment that we do have a seamless transition approach to moving from chair to chair. For example, beyond the 11 Canadian initiatives, Canada ensures that the current chair makes reference to the 85 projects that are ongoing as well. Prior to coming in to the chairmanship, we had extensive discussions with Sweden, and as we leave the chairmanship we are already having extensive discussions with the Americans, who are already also talking to other members. There is that relationship that goes on. It is not just that one day one Government are in and the other Government
are out—“Good luck”. For instance, we are trying to encourage the US to build on some of the work that we began under our chairmanship in such areas as traditional knowledge, mental wellness and sustainable Arctic economic development, including the Arctic Economic Council.

Lord Addington: We are talking about the fact you have a consensus. Everybody has come into the consensus. Therefore you are effectively saying, “As we have agreed, implementation of these things at a national level is not that difficult because you have had a chance to block it”. That is the subtext here. Have you noticed any state that will make it quite clear that it will not agree to something as a result of a very strong national interest? Let me turn it on its head. Is it part of the experience of the council that there have been certain areas that have been directly blocked?

Nicola Clase: In an organisation that is based on consensus, it is clear that once you have reached an agreement, as has been mentioned before on the marine oil pollution agreement and on search and rescue, countries are expected to deliver on those agreements and to implement them. I do not know of any specific area currently where there would be a blockage, so I am not in a position to answer that.

Lord Addington: Are there structures of regional government that have objected to what national Governments have done et cetera?

Nicola Clase: It is always the case in an organisation where you have to reach a consensus that it is not always as easy to come to a decision; it can take quite some time. We have seen some major agreements put in place, and the work that is now being carried on by the Canadians does show that there is constant progress, but we have to be patient. We also have to remember that the Arctic Council is a relatively young organisation. We are talking about a council that was started up in 1996. If you look at what has been achieved in those years, it is quite remarkable. The enormous interest that we see today certainly was not there in 1996.

Q317 Lord Soley: On the Arctic Council, we are, as a Committee, very interested in it. I must admit that I find it a very encouraging development and an innovative structure. What a number of us are struggling with is—certainly I would like your guidance on this—is that the number of observers is expanding. I wonder if you see a limit to that expansion. There are many countries around world that could say, “Well, we want an input because of the
opening up of the northern sea route”. How do you see the role of the observers and the number of observers evolving as the council evolves?

**Alan Kessel:** As the current chair, it may be useful for me to start and then to ask my colleagues to jump in. This is an issue that warmed up during the Swedish presidency and certainly landed on our laps. There is no set limit on the observers, and this issue was considered considerably by Arctic Council members. To that end, we developed a manual for observer engagement, which essentially says that the primary role of observers is to observe. I go back to my earlier comment that the incredible value of this group has been its intimacy, and that the objective—certainly of the Canadian leadership—has been to preserve that intimacy, to engage with those who have a valuable contribution to make and to ensure that there is no dilution of that capacity to engage as states and permanent observers within that context.

Having said that, we are extraordinarily beholden to observers and the contribution that they can make. It goes without saying that 99% of the pollution that we find in our Arctic region emanates from some of those observers who are with us. If those states really want to do something, domestic regulation on issues would be helpful. Mercury is an example of where we worked together. Take a look at the Canadian experience: 5% of the mercury that we find in Canada and in our Arctic region comes from Canada, 95% comes from elsewhere. There is work to be done elsewhere. Black carbon is an example, as are methane and migratory birds. All this needs that interaction with the observers, as you heard from your, I think, Singaporean witness earlier today.

With respect to the UK, it has made an extraordinarily significant contribution to the Arctic Council since its inception in 1996. The UK Arctic policy statement from 2013 clearly acknowledges this and the UK’s contribution to the council’s working groups cannot be overstated. The working groups are where rolling up the sleeves and getting down to it happens. You have this balance between the plenary, where the intimate group gets to talk to themselves about the things they need to do, and the working groups, where the pointy bits get going. We tend to listen more to the observers who come with something useful to say and who have experience in the area, as you can imagine.

On the optimal number of observers, that is a moveable feast. I am happy to discuss that further once you have heard from my colleagues.
Lord Soley: That is a very helpful summary. I would summarise from that that you are not looking at a finite number. You are asking, “What can someone bring to the table?”. Would the other two agree with that as a broad statement on that issue?

Nicola Clase: My Lord Chairman, Sweden would certainly agree with that. We have had a very positive view on the role of observers, just as my Canadian colleague has been pointing out. The contribution from observers can take different forms, as has just been said—sending experts, circulating reports, hosting meetings or participating in the funding, which is very important, or field studies. There is so much that can be done. What is quite helpful is the fact that we now have an observer manual, so it is clearer what the observer role is about. To set a number is something that the Swedish side thought would not be very helpful, because once you set that number it is going to be awfully difficult to handle. With so many countries that could contribute, we should look at the increased role of observers instead.

One more aspect is that we do hope that the EU as a permanent observer will become a reality in the spring when we have the next ministerial meeting. That is something that we are very much supporting.

Q318 Lord Soley: May I ask Canada and Finland whether you would take the view that the European Union ought to come in as an observer? I know that there are some delicacies to this from the past.

Pekka Huhtaniemi: Lord Chairman, I fully concur with what my Swedish colleague said. I do not see any nuance between what she said and what I would say. I would have emphasised the EU aspect as well, so you can take that as an affirmative answer for my part.

Lord Soley: Does the representative from Canada want to comment on that, or would you rather leave it there for now?

Alan Kessel: I made it clear earlier that we were very satisfied with our discussion with the EU and we are not the impediment.

Viscount Hanworth: When my colleague talks about bringing matters to the table, I am bound to think of the seating arrangements in the plenary sessions and the entitlement to speak. Can you briefly fill me in on this? It is a curious question, but it has come up several times in my mind at least.

Alan Kessel: Do you mean in the actual council itself?

Viscount Hanworth: In the actual council.
Alan Kessel: The states and the permanent representatives sit together. There is no hierarchy.

Viscount Hanworth: And the observers?

Alan Kessel: The observers sit behind.

Viscount Hanworth: And remain silent?

Alan Kessel: During the session, yes. Their role takes on greater impetus during the working groups.

Viscount Hanworth: Effectively, they cannot intervene in a plenary session.

Lord Soley: Thank you very much. Can I thank all of you? You have been extremely helpful. If you have any other views you want to put in, we would be glad to hear from you. Mr Kessel, you were very helpful on the British role in the Arctic Council, but if you have views about what else we could do as an observer, in co-operation with other countries or in other ways, please do not hesitate to send those comments in to us. You will get a transcript of the hearing and you will have an opportunity to make sure it is a fair record of what you have said. I really would like to thank you very much indeed. You have been very helpful. I now conclude this session.
Luke Coffey – Written evidence (ARC0017)

1. My name is Luke Coffey and I am the Margaret Thatcher Fellow at The Heritage Foundation, a think tank based in Washington, D.C. In my current role I write and research on topics pertaining to transatlantic security with a specific focus on Anglo-American relations. Previously, I worked for the Rt Hon. Dr Liam Fox MP from 2006 to 2011—including 18 months as one of his Special Advisers while he was the Secretary of State for Defence. I saw firsthand how Dr Fox’s interest in the Arctic while in Opposition translated into Government policy when in the Ministry of Defence (MoD). I am well-travelled in the Nordic-Baltic region, I have visited the Arctic region, and I have briefed congressional staff members on Arctic security issues. At The Heritage Foundation I have published a number of policy papers on Arctic security, albeit from a NATO and US point of view. This written testimony will narrowly focus on security aspects and how the UK, primarily through bilateral and multilateral relationships in the region, can be a security actor in the Arctic.

The UK Might Not Be an Arctic Power—but It Sure Is Close

2. It is a simple fact of geography that the United Kingdom of Great Britain and Northern Ireland is a northern European nation. In fact, the UK is the closest country in the world to the Arctic Circle without actually having any territory above it.\(^{11}\) Dating back to the 16th century, the UK has had a long history of Arctic exploration. The recent announcement that Canada has found one of the two ships lost during the ill-fated Franklin Expedition of 1848 serves as a reminder of this proud history. The UK’s geographical proximity to the Arctic region, coupled with London’s close relations with the Arctic powers, means that the UK has no choice but to pay close attention to Arctic matters.

3. The Arctic region, commonly referred to as the High North, is becoming more contested than ever before. The Arctic region encompasses the lands and territorial waters of eight countries (Canada, Denmark, Finland, Iceland, Norway, Russia, Sweden, and the United States) spread across three continents. Although, unlike in the Antarctic, there is no Arctic land mass covering the North Pole—just ocean—the region is home to some of the roughest terrain and waters, and harshest weather, found anywhere on the planet. The region represents one of the least populated areas in the world, with sparse nomadic communities and very few large cities and towns. Although official population figures are non-existent, the Nordic Council of Ministers estimates the figure to be four million\(^{12}\)—making the Arctic’s population

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\(^{11}\)The small island of Grimsey is the only part of Iceland that is above the Arctic Circle.

slightly bigger than Wales and slightly smaller than Scotland. Approximately half of the Arctic population lives in Russia. It is a region rich in minerals, wildlife, fish, and other natural resources. Some estimates are that up to 13 percent of the world’s undiscovered oil reserves and almost one-third of the world’s undiscovered natural gas reserves are located in the Arctic region.

4. The melting of some Arctic ice during the summer months creates challenges in terms of Arctic security but also new opportunities for economic development. A decrease of ice will mean new shipping lanes opening, increased tourism, and further natural resource exploration. However, it will also mean a larger military presence by more actors than ever before.

**A Role for the UK in Arctic Security**

5. Under the Conservative-Liberal Democratic coalition government there has been a renewed focus on the Arctic region. Perhaps the best example of this was the first ever UK strategy for the Arctic, *Adapting To Change: UK policy towards the Arctic*, published in 2013. However, in terms of the UK’s role in Arctic security, the 40-page document offers only one paragraph, stating:

*The UK remains committed to preserving the stability and security of the Arctic region. This objective will be pursued through a wide range of defence engagement and bilateral security co-operation with a number of close allies and partners in the region. This will include the essential training needed for the military on cold weather training exercise. The role of NATO will remain central, as will the UK’s participation in the Arctic Security Forces Roundtable forum, which promotes security co-operation on issues such as situational awareness and search and rescue missions.*

6. If this sole paragraph is the standard on which UK policy on Arctic security is measured, then the results have been mixed. Although the UK’s Arctic strategy states the UK is ‘committed to preserving the stability and security of the Arctic region,’ the Arctic region is not discussed at all in either the 2010 Strategic Defence and Security Review (SDSR) or the 2010 National Security Strategy.

7. The mention of NATO’s role being ‘central’ to Arctic security is also curious. For reasons that will be explained in more detail later in this testimony, NATO has no agreed common position on its role in the Arctic region. Although NATO’s 2010 Strategic Concept was praised for acknowledging new security challenges for the alliance, such as cyber and energy security, Arctic security was not included. In fact, the word ‘Arctic’ does not appear in the 2010 Strategic Concept, the 2010 Lisbon, the 2012 Chicago, or the 2014 Wales NATO summit declarations.

8. However, one area where the UK has had some success is with its ‘defence engagement and bilateral security co-operation with a number of close allies and partners in the region.’ In 2010, the then-Secretary of State for Defence, Dr Liam Fox, was behind the creation of the Northern Group—a multilateral arrangement that created a forum where the UK can discuss areas of common defence and security interest across the Nordic-Baltic Region. Perhaps most importantly this grouping often met during NATO and EU ministerial meetings to help coordinate common positions. It also meant that the UK has a seat at the table for the very

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first time at the annual Nordic-Baltic Defence Ministers’ meeting. Without Dr Fox’s personal drive and leadership on Arctic issues the Northern Group would not exist today.

9. The UK’s closest bilateral relationship in the European Arctic region is with Norway. Both countries share a long history of bilateral cooperation in the multiple areas, especially with defence. Norway supplies 30 per cent of Britain’s primary energy supplies. Bilateral trade is worth £18bn and is increasing year after year. Norway is a valuable defence partner for the UK. It plays a leading role in NATO, including as one of the few countries to carry out strike missions during the 2011 Libya operation, and has had a contingent of troops serving in Afghanistan. When Russian bombers patrol the North Sea and probe British airspace, the first NATO member to respond is Norway.

10. Dr Fox travelled to Norway twice as Defence Secretary including a visit to Svalbard—probably the first visit of its kind for a British defence secretary. With the foundation laid by Dr Fox, his successor in the defence portfolio, the Rt Hon. Phillip Hammond MP, signed a detailed Memorandum of Understanding ‘On the Enhancement of Bilateral Defence Co-operation’ with Norway and visited Denmark and Sweden. The focus on the Arctic region inside the MoD under the current government has never been greater.

A Role for NATO

11. Regardless whether it is the sunny Mediterranean or the frozen Arctic, NATO is a collective security organization with a mission to defend the territorial integrity of all 28 members. Five NATO members (Canada, Denmark, Iceland, Norway, and the United States) are Arctic countries. In addition, two closely allied nations (Finland and Sweden) are Arctic nations.

12. In May 2014, then-NATO Secretary General Anders Fogh Rasmussen acknowledged that the changing dynamic of the Arctic region will require the alliance to develop a strategy. ‘No doubt the Russians will focus more on the Arctic,’ he said. ‘NATO allies will have to address this issue.’

13. Inside NATO, members view the Arctic differently. Norway is a leader in promoting NATO’s role in the Arctic. It is the only country in the world that has its permanent military headquarters above the Arctic Circle and the primary force driver for its armed forces is Arctic security. The Norwegians have invested extensively in Arctic defence capabilities. Norwegian officials, both military and civilian, want to see NATO playing a larger role in the Arctic.

14. The Norwegian position regarding NATO’s role in the Arctic is in contrast to Canada’s. Like Norway, Canada has invested heavily in its Arctic defence and security capabilities. Unlike Norway, the Canadians have made it clear that they do not want NATO involved in the Arctic. Generally speaking, there is a concern inside Canada that non-Arctic NATO members favour an alliance role in the Arctic because it would afford them influence in an area where they otherwise would have none. As a sovereign nation-state, Canada has a prerogative to determine what role, if any, NATO should have in Canada’s Arctic region. However, as a collective security alliance, NATO cannot ignore the Arctic altogether, and the alliance should not appear divided on the issue.

Russia and the Security Situation in the Arctic

15. The UK’s security concerns in the Arctic are derived from its membership in NATO. Russia’s bellicose behavior toward its neighbours, especially the illegal annexation of Crimea and its military invasion of southeastern Ukraine, makes the Arctic a security concern in a way not thought of only a few years ago.

16. Vladimir Putin has made Russian policy on the Arctic very clear. During a recent press conference outside Moscow he broke away from talking about the situation in Ukraine to say: ‘Our interests are concentrated in the Arctic. And of course we should pay more attention to issues of development of the Arctic and the strengthening of our position [there].’

17. Currently, the Arctic region remains peaceful, but it is a fact that Russia has taken steps to militarize the region. It is Russia’s prerogative to place military assets inside its national territory as it wishes. However, these actions should be a concern to NATO, and by extension the UK, because Moscow has shown its intention to use its military force to achieve its national objectives outside its national borders. One must assume the Arctic region would be no different.

18. Russia’s Northern Fleet, which is based in the Arctic, counts for two-thirds of the Russian Navy. A new Arctic command will be established by 2015 to coordinate all Russian military activities in the Arctic region. Over the next few years two new so-called Arctic brigades will be permanently based in the Arctic region, and Russian Special Forces have been increasing training in the region. Old Soviet-era facilities have been re-opened, for example, putting the airfield on the Kotelny Island into use for the first time in almost 30 years. The ultimate goal is for Russia to deploy a combined arms force in the Arctic by 2020 and it appears they are on track.

19. As ice continues to dissipate during the summer months, new shipping lanes have offered additional trade opportunities. The Northern Sea Route along the Russian coast reduces the time it takes to sail from Europe to Asia by half. However, the opening of the Northern Sea Route also provides Russia with a huge geostrategic advantage in that it can move its naval fleet to Asia far faster than before. For example, during the 1904-1905 Russian-Japanese War, it took Russia’s Baltic Fleet seven months to travel from the Baltic Sea to the Sea of Japan. Of course, modern warships and likely access to the Suez Canal would make the same journey much faster. But this illustrative point shows that Russia has long been concerned about defending its long frontier, and access to the Northern Sea Route offers flexibility that Russian military planners rarely had before. Security of the Northern Sea Route, and the potential of natural resources that the Russian economy is dependent on, is what motivates Russia’s revitalization of old Soviet military bases in the region.

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Situational Awareness

20. Although many of the security challenges currently faced in the Arctic are not yet military in nature, there is still a requirement for military capability in the region that can support civilian authorities. For example, civilian search and rescue (SAR) and natural disaster response in such an unforgiving environment as the Arctic can be augmented by the military. Anyone who has visited or operated in the Arctic will agree that situational awareness of what is happening in the region is extremely important for maintaining security there. Since the distances are vast, the terrain harsh, and the weather extreme, achieving situational awareness in the Arctic region is a challenge in itself.

21. The Arctic environment affects many capabilities that are required for good situational awareness. For example, high-frequency radio signals are degraded in latitudes above 70 degrees north due to magnetic and solar phenomena. The Global Positioning System, which is heavily relied on by both civilian and military authorities, is degraded due to poor satellite geometry.

22. In many ways, the UK is blind in the Arctic. The fastest way for the UK to achieve better situational awareness in the Arctic region is to bring into service a Military Patrol Aircraft (MPA) at the soonest possible moment. The UK has been without a significant MPA capability since March 2010 when the then-Labour Government removed the Nimrod MR2 from service. One of the most controversial, but in my opinion necessary, decisions taken during the 2010 SDSR was the cancellation of the Nimrod MRA4 programme (which was meant to replace the MR2s).

23. Then-Defence Secretary Liam Fox summed up his decision best writing in *The Daily Telegraph*:

The decision to scrap the Nimrod MRA4 programme was one of the most difficult we had to take. This capability was conceived to provide the very outermost ring of long-range layered reconnaissance. The original plan conceived in 1996 was for 21 aircraft to be delivered in 2003. By the time the new Government took office in 2010 the programme had already been reduced to just nine aircraft, was almost £800m over budget with the unit cost of each aircraft ballooning by 300 per cent, and the aircraft were still nowhere near ready to enter service. The single MRA4 aircraft that had been delivered to the RAF was so riddled with flaws it could not pass its flight tests, it was simply unsafe to fly. I am not prepared to put our service personnel into any plane that isn’t safe. It would have taken more money and more time to rectify all the problems, if it was possible at all, and the onward cost of sustaining even the reduced fleet over the next ten years was a prohibitive £2bn. So we took the decision not to throw good money after bad. In the final analysis, it had to go.19

24. The UK has since mitigated the loss of this capability with other platforms such as frigates, Merlin helicopters, and C-130 Hercules aircraft combined with close cooperation with partners such as the US, Canada, and Norway. However, this is a short-term solution to what could become a critical and long-term problem.

25. The lack of an MPA capability will have to be addressed during the next SDSR if not sooner. The UK’s ability to locate, track, and identify surface vessels is limited and depends largely on collaboration with partner nations in the Arctic.

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The Way Forward

26. During the Cold War the UK had two main missions in the Arctic region: defending the so-called Greenland–Iceland–UK gap (to ensure that American reinforcement could arrive to northern Europe) and to reinforce Norway in the event of a Soviet invasion. Although the nature of the threats has changed in the post–Cold War world, the challenges in the Arctic have not gone away. In order to play a constructive role in Arctic security the UK should:

- **Encourage NATO to focus on the Arctic.** The UK has a very close relationship with both Canada and Norway. Consequently, it is the best placed NATO member to broker an agreement on what NATO’s role in the Arctic should be. Ahead of the next NATO Summit in Poland, the UK should work to ensure that consensus inside the alliance on the issue of Arctic security is achieved.

- **Continue to deepen bilateral and multilateral relations in the Arctic.** The current Government has made a real effort to engage with its northern European neighbours and this should continue. The new Secretary of State for Defence, the Rt Hon. Michael Fallon MP, must continue with the Northern Group initiative.

- **Include the Arctic in the next SDSR.** As a leading member inside NATO, the UK has an obligation to ensure its defence planning fulfills its obligations inside the alliance. With nationalism increasing in Russia, coupled with Moscow’s willingness to use military power to achieve national objectives on its periphery, the next SDSR should factor in the Arctic.

- **Bring into service real and credible MPA capability.** Although the cancellation of the Nimrod MRA4 was the correct decision at the time, it is quite extraordinary that the U.K. has gone so long without a dedicated MPA capability. The UK should consider ‘buying off the shelf’ the Boeing P-8 Poseidon—a tried and tested MPA platform—from the USA.

Conclusion

27. The UK has an interest in stability and security in the Arctic because of its history in the region, its geographical proximity, and its leading role inside NATO. With the Arctic becoming increasingly important for economic and geo-political reasons, now is not the time for the UK to turn away from its own backyard. Sensible policy decisions will make the UK an important Arctic security actor. This is in the UK’s and NATO’s interest.

*September 2014*
1. Summary

1.1 In response to House of Lords Arctic Select Committee’s call for evidence dated the 22nd of July 2014, it is intended that the following submission of evidence help to facilitate a greater understanding of those existing legal frameworks that help govern indigenous engagement. It is the aim of this submission to highlight the emerging trend of private sector adoption and implementation of International Labour Organization’s (ILO) Indigenous Peoples Convention, 1989 Number 169 (henceforth ‘C169’) and its relevance to those British companies looking to increase their operational presence in the Arctic.

1.2 As C169 currently represents the World’s only binding convention on indigenous rights, the private sector has begun to adopt C169 as a ‘moral legal framework’ so as to better engage with those indigenous stakeholders associated with its operations. Such adoption of the convention stands in contrast to the more customary process of governmental ratification of the convention by ILO member states. The most recent country to announce its intention to formally ratify the convention was Finland on the 27th of November 2014, which once finalised would make it the twenty third nation and third Arctic nation, to formally adopt C169 into its national legislation.

1.3 President evidence suggests that the private sector and in particular the extractives sector, along with national development banks and projects, has begun to adopt C169 into its own operational practices and procedures. This is being done with the goal of ensuring stable and sustainable operations through better indigenous engagement and consensus building, following the primary principles of ‘consultation and participation’ espoused by the convention.

1.4 A key factor in encouraging private sector adoption of C169 is the support offered from the ILO’s Committee of Experts on the Application of Conventions and Regulations (CEACR). Due to the tripartite nature of the ILO, governments, unions and crucially employers, may take unresolved cases to the CEACR. In many cases the CEACR presents actionable advice through tripartite consensus within the country without the need to go before an industrial tribunal. Other factors encouraging private sector adoption also include opaque national legislation governing indigenous engagement and the need to manage increasing levels of exposure to corporate risk posed by social media. Over the past five years the International Labour Office in Geneva has, under the stewardship of its new British Director General Guy Ryder, has seen increasing requests from the private sector for both support and training in how best to engage with and implement the convention.

1.5 While primarily evidence of its deployment originates from Latin America, South East Asia and in parts of Sub-Saharan Africa, it should be stressed that such standards will, over the coming decades, be increasingly relevant in the context of resource extraction in challenging resource frontiers such as the Arctic. The purpose of this evidentiary note therefore, is to bring the aforementioned trend to the attention of the House of
Lords Arctic Select Committee and by doing so help present a potential operational standard that may be highlighted in addressing the committee’s second question: ‘Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities and how might they be delivered? What should the role of the UK, Government, of British businesses and of other sectors of civil society’.

1.6 It is hoped that this evidence will increase awareness C169 and role that it might play in providing stable operational standard, one by which British companies may engage with indigenous Arctic communities. It is hoped that greater engagement with this convention may help facilitate stable operations, indigenous relations, and credibility in one of the Twenty First Century’s most challenging and contentious resource frontiers.

2. Key Information regarding the operation of C169 and the trend of private sector adoption of the convention.
(Derived from first hand interviews conducted at the International Labour Office in 2014 and from related ILO documentation - see section 5.1)

2.1 Significance of the ILO and Convention 169

2.1.1 International Labour Organization or ILO is the only tripartite UN organisation (Governments, Unions and Employers Associations or Private Sector) & remaining vestige of ‘League of Nations’ and was the first international body to engage with indigenous peoples in the 1920s.

2.1.2 Adopted by the ILO 27th of June 1989 in 1986, ILO Convention on the Rights of Indigenous and Tribal Peoples, 1986 (henceforth C169) represents the world’s only binding convention on the rights of indigenous peoples.

2.1.3 At its core C169 is a legal framework and guiding tool based on the International Covenant on Civil and Political Rights, 1966 (ICCPR) so as to help governments, NGOs, unions and the private sector engage with and protect indigenous rights.

2.1.4 Ratified Nations in the Arctic include: (I) Norway, first nation to ratify the convention on the 19th of June 1990, (II) The Danish Kingdom, (included Denmark, the Faroe Islands and Greenland) ratified the convention on the 18th January 1996 and will soon include (III) Finland as announced on the 27th of November 2014.

2.1.5 While resource extraction in the Arctic presents a significant opportunity for development, upholding principles of Free and Prior Informed Consent (FPIC) and the right to Participate is vital in ensuring such development is socially equitable and sustainable.

2.1.6 C169 covers issues of land rights and resource extraction (Articles 14 and 15), recruitment and conditions of employment (Article 20), social security and Health (Article 24 and 25), education and Means of communication (Articles 26 to 31).

2.1.7 22 ratified ILO member states under C169. Soon to be 23 including Finland.

2.1.8 Equates to 50 million indigenous & tribal people throughout Latin America, Africa, Europe, the South Pacific and the Arctic.
2.1.9 C169 Indirectly helping to establish standards in over 70 countries worldwide via adoption through domestic courts, national development banks and aid programs as well as private sector operations.

2.2 Structure of ILO Convention 169

2.2.1 C. 169 covers key areas including:
   2.2.1.1 Land rights and resource extraction (Articles 14 and 15)
   2.2.1.2 Recruitment and conditions of employment (Article 20)
   2.2.1.3 Social security and Health (Article 24 and 25)
   2.2.1.4 Education and Means of Communication (Articles 26 to 31).

2.2.2 Indigenous rights to land and the conventions key principles relating to Consultation and Participation are contained within Part II (parts 1 and 2) and are of particular importance of indigenous rights with regards the intended development of natural resource sector within the Arctic:

<table>
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<tr>
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<th>ILO Convention 169, Part II. (Land) Article 15 (1 &amp; 2),</th>
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<tr>
<td>2.</td>
<td>(1) Participation</td>
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<tr>
<td>3.</td>
<td>The rights of the peoples concerned to the natural resources pertaining to their lands shall be specially safeguarded. These rights include the right of these peoples to participate in the use, management and conservation of these resources.</td>
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<td>4.</td>
<td>(2) Consultation</td>
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<tr>
<td>5.</td>
<td>In cases in which the State retains the ownership of mineral or sub-surface resources or rights to other resources pertaining to lands, governments shall establish or maintain procedures through which they shall consult these peoples, with a view to ascertaining whether and to what degree their interests would be prejudiced, before undertaking or permitting any programs for the exploration or exploitation of such resources pertaining to their lands. The peoples concerned shall wherever possible participate in the benefits of such activities, and shall receive fair compensation for any damages which they may sustain as a result of such activities.</td>
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2.2.3 Under C169 indigenous peoples are required to be both adequately consulted and allowed to participate in development, these are known as the ‘cornerstones of the convention 169’.

2.2.4 Right to both consultation and participation not specifically ascribed to indigenous peoples and forms the basis of all ILO conventions.

2.2.5 The convention requires all ratified member states be obliged to consult indigenous and tribal peoples through traditional institutions, on all legislative or administrative measures that might affect them.

2.2.6 Principle of ‘Representativeness’ crucial to convention and states process of consultation must be conducted in a way that accurately reflects their interests of indigenous peoples and allow the opportunity for such peoples to have some influence over the decision making process.
2.2.7 Although C169 makes no requirement that consensus must be found. If the government fails to comply with principle of ‘Representativity’, then the process of consultation will not be deemed acceptable.

2.3 Supervision of C.169 by UNIPP and ILO

2.3.1 United Nations Indigenous Peoples Partnership (UNIPP) was established in 2011 as the coordinating initiative to facilitate collaboration on indigenous rights across all UN organizations involved in indigenous rights.

2.3.2 UNIPP has its own supervisory mechanism supported by the UN Permanent Forum on Indigenous Issues (UNPFII), Human Rights Council’s Expert Mechanism on the Rights of Indigenous Peoples (EMRIP) and the UN Special Rapporteur on the rights of indigenous peoples.

2.3.3 ILO remains the primary partner organization with the key monitoring and supportive mechanism called the Committee of Experts on the Application of Conventions and Recommendations (CEACR).

2.3.4 The CAECR consists of a board of 20 experts supported by specialist staff some of whom work specifically on particular conventions such as dedicated ‘PRO169’.

2.3.5 Ratifying member states are required to submit a Quinquennial report on the implementation of C.169 (prepared in consultation with indigenous or tribal institutions) to the CAECR which then issues comments and guidance to said countries.

2.3.6 Persisting issues will then be reviewed by the ILO’s tripartite Conference Committee on the Application of Standards with the aim of generating conclusions to be sent to the government in question with offer of support.

2.4 Corporate risk and the adoption of C.169 by the privates sector

2.4.1 Bodies such as the World Bank increasingly view principles within C169 vital to sustainable and politically stable development.

2.4.2 Outside of the 22 ratifying ILO member countries the private sector has begun to adopt these standards so as to better engage with indigenous stakeholders.

2.4.3 Adoption of C169 by the private sector (especially the extractives industry) has been partially driven by the lack of legal foundations for engaging with indigenous peoples, combined with greater operational risk/exposure through digital communication devices (camera phones) and social media platforms (Facebook, Twitter etc.).

2.4.4 C169’s thorough but flexible approach to indigenous engagement and self-determination combined with the ILO’s representative tripartite supportive mechanism through the CAECR, has meant that extractives industry has begun to adopt C169 so as to proactively protect their investments.

2.4.5 Through adoption of C169 a private body has access to the a system of deliberation in the form of the CAECR and the ILO’s tripartite Conference Committee on the Application of Standards where they are formally recognized as part of the employers caucus within the tripartite system ([I]Government [II] Unions [III] Employers (private sector)).

2.5 Privates sector’s interaction with the ILO and the international system
2.5.1 In recent years the C169 and its legal framework has been incorporated into the development regulations of the UN Development Group, the World Bank, Inter-American Development Bank and the Asian Development Bank.

2.5.2 On the 319th Session of the Governing Body in October 2013, employers’ delegation requested a general survey to be conducted as to the use of C169 by the private sector, the first of such requests in 25 years.

2.5.3 Over the last 4 years and since the appointment ILO’s 10th Director General, Guy Ryder, the ILO has received multiple requests for training and the establishment of permanent training programme (not approved) surrounding the utilisation of C169 by the private sector.

2.5.4 The World Bank through the International Finance Corporation (IFC) and the United Nations Global Compact group (UNGC) has begun to produce supporting material and training manuals so as to help the private sector to better interact and understand the operational implications of both the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and ILO C169 (please see Section 5.1).

2.5.5 During a seminar held at the UN in Geneva from the 27th to the 28th of November 2014 marking the 25th anniversary of the ILO’s adoption of C169, members of the employers’ delegation to the ILO (representing the private sector) expressed their utility of convention to the private sector.

2.6 Concluding points

2.6.1 C169 represents a global tool and reference point for the private sector so as to better engage with indigenous peoples and manage operational risks and create a more favourable environment for sustainable and equitable enterprises.

2.6.2 Private sector has increasingly prioritised indigenous rights and to re-frame indigenous peoples from vulnerable parties to stakeholders or in some cases business partners.

2.6.3 The greater exposure and accountability brought through new social media platforms combined with the development of the new UN Sustainable Development Goals (SDGs) from 2015 onwards, will ultimately represent new ‘pressure points’ for the private sector, and specifically the mining sector.

2.6.4 Increasing investment in re-emerging resource frontiers such as the Arctic has increased demand for a ‘moral operated legal framework’ from the private sector so as to better manage operational corporate risk and accountability, this is especially the case in scenarios where private sector investments in a country may exceed two billion US dollars.

2.6.5 C169 as a ratifiable convention, hosted by a tripartite international organisation and supported via an established supervisorial system represents the only such (potentially binding) legal framework for the foreseeable future and should therefore be given due consideration by all sectors with regards the future governance of the Arctic.

2.6.6 Increasing trend of private sector adoption of C169 will require more scrutiny from both the ILO, national governments and researchers alike so as to bring about a better understanding of the trend and its implications going forward.
3. Background and qualification to provide evidence to the committee

3.1 I am in the final year of my doctorate at the University of Oxford’s School of Geography and the Environment (SoGE) having focused the last three years researching indigenous labour market engagement and the application of indigenous rights based legislation within the context of resource extraction in the Arctic. My thesis is centred on an in-depth case study of increasing foreign investment into Greenland’s mining sector and the potential impacts this may have on the Greenland’s labour market and society.

3.2 My knowledge as to the international system as well as its associated conventions and declarations is informed by having worked part time over a period of seven years as an external collaborator within the Employment Trends Department at the United Nation’s International Labour Office (ILO) in Geneva. During this time I worked on the technical development and release of the Global Employment Trends (GETs) and the Key Indicators of the Labour Market (KILM) publications.

3.3 The focus of my doctoral topic combined with the my previous work at the ILO enabled me to have a unique insight into this topic and enabled me to present on this issue, initially in my capacity as a member of the British Delegation to the Arctic Circle Conference (2014) held in Reykjavik, followed by a special seminar marking the 25th anniversary of the adoption of C169 by the ILO held at the UN in Geneva. In addition to the above, I am a founding and steering committee member of the Oxford University Polar Forum (OUPF), a Postgraduate Fellow of the Royal Geographical Society and an Associate of the Royal College of Science (ARCS). I first developed my interest in indigenous land rights while reading for my bachelor’s degree at the University of Cambridge’s Department of Land Economy.

4. Supporting material

Key Publications:


The evidence presented here is an individual submission by Duncan Depledge based on doctoral research investigating the development of contemporary British Arctic policy. The research was undertaken at Royal Holloway, University of London, with the financial support of an ESRC CASE studentship (2011-2014). The CASE partner for the project was the Royal United Services Institute, a leading defence and security tank-tank based in London.

Summary

1. The Arctic region is undergoing an unprecedented period of dramatic change primarily as a consequence of climate change. First and foremost this is affecting the lives of the four million people (including minority indigenous populations who directly depend on the Arctic’s biological resources to sustain their way of life), for example, through the damage melting permafrost is causing to homes, transportation links and other types of infrastructure. More broadly, parts of the Arctic region are becoming more permissive of all kinds of human activity relating to resource extraction, science, militarisation, shipping and tourism. These developments are emerging as a consequence of environmental changes, technological innovation, changes in governance and new economic incentives. It is in the interaction of these drivers that new opportunities and new risks are arising, and all four factors (i.e. environment, technology, governance and economics) must be considered when assessing future trends in the region.

2. UK Arctic policies are complicated by the problem of whether to treat the Arctic as a single, discreet region, or as a patchwork of places, which are of more or less interest to British-based scientists, environmental NGOs, businesses and other stakeholders. If the UK is to have a holistic strategy towards the Arctic region, it would best be defined in terms of what is shared and common as well as exceptional to the Arctic as a discreet region rather than attempt to reconcile different interests (science, energy security, commerce, defence) which produce UK Arctic policy in fundamentally different ways.

Issues

3. The UK is implicated in all four of the above drivers of Arctic change.

4. Greenhouse gas emissions, black carbon and other forms of pollution produced by British industry, transport and homes negatively impact the Arctic environment and those that live there. At the same time, for the UK, positioned as it is in the mid-latitudes, changes in oceanic, atmospheric and cryospheric conditions in the Arctic may lead to further repeats of the very cold winters experienced in 2009 and 2010 (the cost of which was felt through increased demand for heating and disruption to the UK’s transport infrastructure).

5. The British economy is a hive of innovation. Much of the Arctic is still seen as a frontier environment. The hostile environmental conditions associated with the extreme cold, sea-ice, the effects of magnetism and extreme day/night variation have implications for
navigation, communications, scientific equipment and infrastructure resistance, as well as the mental and bodily performance of those visiting the Arctic. Increased interest in developing human activity in the Arctic will necessarily depend on and drive further technological development creating opportunities which British national research centres, universities and businesses can and do bid for and deliver (for example, a number of UK scientific institutions are partners in major EU-funded Arctic science programmes including ICE-ARC and INTERACT).

6. As the British economy recovers from the global financial crisis of 2008, new opportunities to secure the UK’s long-term prosperity are being sought globally. The Arctic is not exceptional in this regard. Nevertheless, the Arctic (e.g. Greenland, Alaska and the Russian offshore continental shelf) has attracted specific interest from British-based IOCs (BP and Shell), and smaller operators (for example, Cairn Energy and Tullow Oil) which are now dependent on their ability to find and develop new large oil and gas fields in order to meet their projections of future global energy demand. However, growing resource nationalism means that IOCs are increasingly limited to securing minority shares in joint ventures led by national enterprises (for example, Rosneft in Russia), and/or exploring for resources in technologically challenging conditions that depend on high-risk investments. While the Arctic offers an opportunity to IOCs, they will constantly be assessing the investment risks against market prices for oil and gas, as well as other ventures relating to deep-sea drilling and shale gas. The economic incentives to operate in the Arctic are therefore highly dynamic and related to other variables. The recent conflict with Russia over Crimea/Ukraine further highlights the potential for political risks to threaten long-term commercial ventures.

7. The eight Arctic states (US, Canada, Russia, Norway, Iceland, Finland, Sweden and Denmark) exercise sovereign rights over much of the Arctic Ocean. A number of these states are seeking to extend their sovereignty with legal reference to the UN Law of the Sea Convention (UNCLOS) and Commission on the Limits of the Continental Shelf (CLCS). The US has not ratified UNCLOS but considers the ‘Law of the Sea’ part of customary international law. In addition to these provisions, the Arctic states established the Arctic Council in 1996. The Arctic Council has emerged as the primary diplomatic forum for exchanging views and reaching consensus on Arctic issues. There are now 12 observer states (including the UK), which attend the Arctic Council to observe meetings and participate in the scientific working groups.

8. Recently the Arctic Council has helped to establish an independent Arctic Economic Council (AEC) where commercial opportunities in the Arctic can be considered. The Arctic Security Forces Roundtable (ASFR) provides a forum for the Arctic states and a number of observer nations (including the UK) to discuss collective security challenges facing the Arctic. Arguably, this tripartite arrangement of the Arctic Council, AEC and ASFR means that there is now a multi-dimensional framework in place which covers a broad range of issues relating to the Arctic, although all three forums are still in their infancy. The UK is involved as an observer in every dimension.

9. The biggest challenge facing international governance in the region concerns how relations are managed between Russia and the other Arctic states (and arguably the
Arctic observer states). Russian Arctic policy is typically represented in the West in aggressive, expansionist terms, often without appreciating that the development of Russia’s Arctic Zone (which Russia hopes to turn into its national resource base by 2020) is hugely dependent on outside investment, technology and expertise. On the one hand then, Russia is likely to continue seeking cooperation from North America, Europe and East Asia. On the other hand, no one should ignore the fact that Russia offers its own interpretation of how international treaties apply to both the Svalbard archipelago and freedom of navigation through Russia’s Exclusive Economic Zone and the Northern Sea Route. Conflict in either of these areas (whether independently or as an extension of other conflicts – i.e. the current crisis over Ukraine/Crimea) will likely lead to the marginalisation of Russia – the largest Arctic state – and negatively disrupt the activities of the Arctic Council, AEC and ASFR.

10. The UK’s current security posture toward the Arctic is rooted in providing strategic reassurance to Norway (a major exporter of energy to the UK) and the broader Nordic/Baltic region. The UK currently lacks the expensive naval capabilities required to operate surface warships in icy waters. However, the area of strategic interest to the UK (primarily covering parts of the Norwegian, Greenland and Barents seas) is characterised by warmer waters where surface warships can operate without ice-strengthened hulls. The greater challenge for defence is to maintain a watching brief to assess whether to increase deployments in these waters. For example, in light of the recent deterioration of relations between NATO and Russia, the UK may be asked to increase its presence in near-Arctic waters in support of Nordic and Baltic allies (in September 2014 it was announced that the UK would lead a new NATO joint expeditionary force comprising the UK, Denmark, Norway, Estonia, Latvia, and Lithuania, and the Netherlands). How the UK responds will need to be weighed against other strategic priorities in the wider world.

11. UK Arctic policy, as it is set out in the Arctic Policy Framework (APF, 2013) appears broadly cognisant of the above issues. The government’s current approach is to devolve responsibility for different policy areas to those departments with the appropriate level of policy expertise to lead on the government’s response. The Cross-Whitehall Arctic Network, chaired by the Polar Regions Department (PRD) of the Foreign and Commonwealth Office, provides an important mechanism for information sharing and coordination of interests. The PRD remains the most logical lead department coordinating UK Arctic policy as it represents the UK at the Arctic Council and as such requires a holistic view of British interests and activities.

12. Arguably, there are two significant challenges facing the further development of UK Arctic policy.

13. The first concerns communication. In practice, British interest in the Arctic is heterogeneous, often limited to specific sites and activities, rather than the Arctic as a whole. There is a disjunction then between what happens in practice and the presentation of British policy in the Arctic as British policy toward the Arctic. The APF currently obscures the fact that few actors in the UK consider the Arctic to be a single, discreet space (indeed the ‘Arctic region’ is arguably a post-Cold War geopolitical construct). Similarly, this creates a further problem that the PRD, as the UK’s ‘Arctic
Face’, is often unfairly assumed to exercise full responsibility for the development and delivery of UK Arctic policy while the work of other departments appears to be rarely recognised or scrutinised in the same level of detail.

14. The second concerns the material delivery of UK Arctic policy. Britain currently is not in a position to compete with other Arctic states and Arctic Council observers (such as Norway, Russia, Korea and China) in terms of the financial and material resources that it can commit to the Arctic. This is because budgets for science and defence are prioritised elsewhere. The lack of state enterprises means that the decision to pursue economic opportunities rests with British-based businesses themselves (although they might work with government to alleviate political risks). In governance terms, as an observer the UK only has a limited role in the Arctic Council, AEC and ASFR. Use of the UK’s polar logistics (including the planned future research vessel) will be prioritised in Antarctica (although NERC’s Arctic Office and Arctic Research Programme will continue to direct a small proportion of the UK’s polar resources to the Arctic).

**Recommendations**

15. The Government needs to decide on, and publicise, the priority it affords to the UK’s Arctic interests, relative to other geographic regions. These priorities will not be uniform across government (science, commerce, diplomacy and defence will have different requirements). Even if resources for delivering Arctic policies remain limited, re-emphasising the British government’s commitment to the region will help the UK to punch above its weight, diplomatically, scientifically and economically.

16. The Government should appoint a special representative to the Arctic who is accountable for the delivery of UK Arctic policies. The special representative should not be an ambassador (as this would conflict with the country ambassadors already in post in Arctic states) or a minister (as the UK does not have ministerial representation at the Arctic Council). The special representative should chair the Cross-Whitehall Network Group with support from the PRD and have the authority to scrutinise policy development across government. This will create a clear line of accountability in the delivery of UK Arctic policy across all of the government departments involved in Arctic policy development and provide a rallying point for stakeholders (including business and environmental NGOs with Arctic interests). The special representative may be based in the PRD but should exclusively focus on Arctic issues (leaving responsibility for Antarctica to the PRD and relevant ministers).

17. The Arctic Policy Framework should be reframed as a set of policies to be pursued in the Arctic rather than toward the Arctic. Doing so allows for a clearer expression of geographical variation and prioritisation of interests, reducing the potential for the Government to be accused of pursuing contradictory policies.

18. The Government should commit to updating the Arctic Policy Framework at least every 5 years in line with the electoral cycle (while also being prepared to respond to more sudden developments) to reflect the changing priorities and resource capabilities of the UK in the Arctic. As such, the next full review of the APF should take place in 2015. As
part of this review, every government department involved in Arctic policy development should be required to reassess whether the priority afforded to their Arctic-related interests is still appropriate given the current dynamism of regional developments.

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Evidence Session No. 21

HE Else Berit Eikeland and HE Thórdur Aegir Óskarsson – Oral evidence (QQ 273 – 283)

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TUESDAY 11 NOVEMBER 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Oxburgh
Lord Soley
Lord Tugendhat

Examination of Witnesses

HE Else Berit Eikeland, Norway’s Polar Ambassador and Senior Arctic Official to the Arctic Council, and HE Thórdur Aegir Óskarsson, Icelandic Ambassador to the United Kingdom

Q273 The Chairman: Your Excellencies, I welcome you to the House of Lords Select Committee on the Arctic for our 21st session in which, for the first time within Westminster, we are taking evidence from Arctic states themselves. You should have had a copy of our interests as a Committee. As you are aware, we are being broadcast. Perhaps I may ask you both to introduce yourselves, beginning with whoever would like to start.

Else Berit Eikeland: Thank you, Lord Chairman. My name is Else Berit Eikeland and I am the Polar Ambassador of Norway and the senior Arctic official to the Arctic Council. Thank you.

The Chairman: I thank you for coming from Norway for this evidence session as well. We very much appreciate it.

Else Berit Eikeland: It is always fantastic to come to London.
HE Else Berit Eikeland and HE Thórdur Aegir Óskarsson – Oral evidence (QQ 273 – 283)

Thórdur Aegir Óskarsson: Thank you, Lord Chairman. I am Thórdur Aegir Óskarsson, the newly appointed ambassador of Iceland to the United Kingdom, coming from Canada, where we spent some time together as ambassadors. That is my short take on it.

The Chairman: Your Excellency, I welcome you to the United Kingdom. I am delighted that you can come to the House of Lords so early in your time here. I hope you will find many other times to return here.

Perhaps I could start off our questioning by asking what the priorities are for Iceland and Norway in the Arctic? How are your countries affected by the changes in the Arctic, and what are your key aims for the region over the forthcoming years?

Thórdur Aegir Óskarsson: Actually, the Icelandic policy on the Arctic is based on a document from 2011—a quite extensive document that you probably do not want me to read to you now. If I may summarise it, it includes promoting and strengthening the Arctic Council as the most important consultative forum and decision-making body; securing Iceland’s interests as a coastal state within the Arctic region and developing agreements and promoting cooperation with other states and stakeholders in the Arctic region; safeguarding broadly defence and security interests in the Arctic region; and, lastly and importantly, working against any kind of militarisation of the Arctic. The present Government have this Arctic policy as the centre of their foreign policy. They have adopted a whole-government approach to these issues. As you understand clearly, these cover so many different aspects of the generality and of each Government. That is the short version of the policy.

Iceland is affected mainly by the environmental aspects. Climate change is an ongoing concern for all of us, and increasingly so. It affects the fisheries, as you probably heard in the previous session. We are also experiencing on our own grounds a more rapid melting of the
glaciers. This where our focus lies: on the environment and how our resources will progress with the changes in the climate.

Then again, these changes are met with opportunities. Of course the Government are very focused on using those opportunities wherever they might arise. That could include co-operating with other partners in the Arctic on resource development and changes in transportation, services, tourism, and possibly shipping lanes over the Arctic Ocean. That is for the future but it is where our focus lies. That is the short version.

**The Chairman:** Thank you.

**Else Berit Eikeland:** Thank you, Lord Chairman. The Norwegian strategy is very similar to the Icelandic strategy. The Committee, I believe, has visited Tromsø and Svalbard, and you are very much informed that the Arctic is not a homogenous region. In the Norwegian Arctic, where 10% of the Norwegian population lives, the areas along the northern coast of Norway are ice-free and comparable to some of the oceans further down towards the North Sea. A key for Norway, in line with interests of the people living in the north, is to promote sustainable economic, environmental and social development.

Norway has big neighbours. We have a very good and close co-operation with our neighbours, including Russia. It is also reflected in our strategy that we want—this is not a kind of academic lesson—to keep the Arctic peaceful and stable. We look at the cooperation in the Arctic Council and the close co-operation that we have with Russia as soft security, to engage our neighbours in close co-operation. For people living in the north, it is most important to live in a region with peace and stability.

**The Chairman:** Thank you. That was a very good introduction. I think that many of the supplementary points will come up during the rest of the session. Perhaps I can ask Lord Hunt to follow on.
Q274  **Lord Hunt of Chesterton:** I am sorry that the Chairman did not compliment you on coming from the oldest Parliament in the world to our rather new Parliament! I had a very interesting visit to Iceland some years ago. The question really is: how active are Norway and Iceland in the Arctic Council? You said that that is important. Can you give us some specifics? One of the issues that you have just touched on is the question of military or non-military. The Arctic is a sort of military playground in some senses and there are some residual effects, particularly the radioactivity and radioactive wastes, associated with that, particularly in the Russia/Norway area. Would you like to comment on that?

**Else Berit Eikeland:** Thank you. We do not regard the Arctic as a military playground; we regard it as one of the most regulated areas in the world when it comes to regulation of fisheries and environmental issues. Also, the Arctic can be an example for other regions when it comes to very close co-operation on a state-to-state level. As you are aware, the Arctic Council was established in 1996 as an example of co-operation with Russia and an indication that the Cold War was over, so working in the Arctic Council is about much more than working on environmental issues, climate change and sustainable economic development; it is also a soft-security issue for Norway to engage with the other Arctic states in long-lasting co-operation. It is very important to Norway to strengthen the Arctic Council, to see it develop and to work with observers like the UK.

**Lord Hannay of Chiswick:** Could I ask a supplementary question?

**The Chairman:** Perhaps I could ask the Icelandic ambassador to answer Lord Hunt’s question first. Then Lord Soley and Lord Hannay will ask questions.

**Thórdur Aegir Óskarsson:** I agree with my Norwegian colleague that the Arctic Council does not deal with military issues, and we do not see a military arms race going on in the Arctic. But there may be a bit of a variation on this theme, since we see for example the effects of
the present crisis in Ukraine possibly affecting good co-operation with the Arctic Council. Still, the Russians are co-operating differently in the Arctic Council from the way you might say they are doing in the security field in central Europe.

**Lord Soley:** Wider than the defence issue, what the Arctic Council is doing is a form of governance of the Arctic, and I would very much like to know how you see that changing and evolving. With all these new observer states coming in, the region is changing very dramatically, if we are to believe some of the scientific evidence, so how do you see the evolution of the Arctic Council as a governance for the Arctic?

**Else Berit Eikeland:** Thank you for a very relevant question. We have seen a gradual strengthening of the Arctic Council. From 1996, the Council has worked mostly on environmental issues. From around 2005-06 it has gradually been more involved in climate change and adaption to climate change, and now that there is more interest in business development and more activity in the Arctic it has more focus on sustainable business development and trying to involve business. Two binding agreements between the Arctic States have been negotiated in the framework of the Arctic Council. The Arctic Council, as you know, is not a treaty-based organisation, so it cannot sign treaties, but the Arctic states have signed treaties on oil-spill prevention and search and rescue. We see gradually that the Arctic Council will discuss new areas of co-operation. Norway very much supports the Canadian priority to establish an Arctic Economic Council for business in order to have dialogue with business on sustainability and responsible resource development in the Arctic. We in Norway feel very much that we need to engage more strongly with all the observers in the Arctic Council. Norway and the UK have very good bilateral dialogue on Arctic issues, including cooperation within the Arctic Council. We have long historical connections with the UK in Antarctica, as you are all aware. We have a common history and we want to work even
closer with the UK in the Arctic as well. We do not see the new Asian observers and China as making it more difficult for us to work with observers. On the contrary, we are much more focused now on the need to engage with observers to develop the Arctic Council further.

**Q275 Lord Hannay of Chiswick:** Both of you mentioned fisheries, and I wonder whether your two Governments have taken any view on how best to handle a situation in which the polar ice cap reduces, fish stocks gradually move further north and there becomes an interest in fishing in the high seas, not in the EEZs, which we understand perfectly well are regulated by the states.

**The Chairman:** Lord Hannay, Viscount Hanworth is going to come on to that specific question later.

**Lord Hannay:** I am sorry. I had not realised that. I was going to ask it because there was a mention of fisheries.

**The Chairman:** It is an important area which we will come to later. Ambassador Eikeland, you mentioned a couple of times strengthening of the Arctic Council and I just want to be clear about that. Can you encapsulate what a strengthened Arctic Council would look like? You described the two legally binding agreements on the Arctic Council that already exist. When we asked the Canadian Chair of the SAOs where it goes from there, I do not think he was able to give a specific answer. I wonder whether you have an opinion on that.

**Else Berit Eikeland:** Thank you. I think that the Norwegian SAO is probably more outspoken. It is probably part of our political culture in Norway that there is a lot of consensus among all the political parties when it comes to the Arctic, so it makes us more outspoken. It is difficult to say whether there will be a new binding agreement next year or the year after. When it comes to looking at closer cooperation in the Arctic Council, I would like to mention a possible closer cooperation on science. It is not of deciding the priorities of science—
because we want science not be decided by the Arctic Council but to be free, so to speak—but more of facilitating science as for example transferring of equipment and travel of our scientists. That would be a good way to move forward, especially when it comes to Russia, which is a very legalistic society. It would also be important to do more on oil spill prevention.

The Chairman: Thank you. Yes, Ambassador.

Thórdur Aegir Óskarsson: I just want to comment on these particular issues. I think that the council is moving really fast now. Since the demands are increasing so fast, it needs to react must faster than it has done. We are seeing different issues exploding both in business co-operation and in environmental security and protection. Now, it must move more into policy-shaping and decision-making, but that might be difficult because it is getting even closer to the more sensitive issues all the time. So the future is in a sense unmarked on the question of how we strengthen the council.

Also, we need more clarity on the observer standards—how we engage with the observers, how we might benefit from their expertise and how they might benefit from us. This is also a big agenda issue for the coming years. Engagement with the observers is getting quite demanding, so there has to be more of an outlet for substantive discussion between these two categories of partners.

The Chairman: What I gather from both of you is that there is no cast-in-stone blueprint, if I may mix my metaphors, for the direction in which the Arctic Council should go.

Thórdur Aegir Óskarsson: I would say no, because the Arctic Council has developed under rather benign conditions from being a scientific body to being a decision-making body. The two agreements that my colleague referred to are very recent and they need an implementation phase to a large extent.
Else Berit Eikeland: Let me just add from the Norwegian perspective that we feel that, when history is written maybe in 20 or 30 years’ time, the Arctic Council will be one of the most successful diplomatic establishments from the 1990s and as a result of the Cold War. The Arctic Council established a secretariat in Tromsø. I believe that the Committee visited the secretariat. We see very much that we need continuity in the Arctic Council. The different Arctic states will be in charge of the chairmanship, but, with the American chairmanship, we are now seeing signals of strengthening the secretariat in Tromsø and of having more continuity when it comes to working groups and engagement. I think that we need to take one step at a time with the establishment of the secretariat, but strengthening the organisation would be important.

Q276 Lord Hannay of Chiswick: Have you given any thought to what the European Union has done over the years in trying to achieve greater continuity? That is to say, have you given any thought to having a kind of troika of presidencies so that you do not have individual presidency priorities developed just by one country but priorities that span a much longer timescale, which in some cases would seem to me to be very suited for Arctic conditions?

Else Berit Eikeland: Thank you. Yes, we have looked at the European Union’s way of organising things. Of course, the European Union consists of many more countries than the Arctic states. But we are looking in that direction so that the country with the chairmanship can have some priorities but also so that the continuity of what the Arctic Council is doing is really reflected in the working groups and is not dependent on the different priorities of the chairmanship.
Viscount Hanworth: But are the Arctic nations happy that the secretariat of the Arctic Council has been established in Tromsø, or is there some rivalry as to where it should be located? Indeed, are there any ideas that it should be peripatetic?

Else Berit Eikeland: The Ministers decided to establish the secretariat in Tromsø and I do not see that there are any disputes about that.

The Chairman: Ambassador Óskarsson, did you wish to comment on this?

Thórdur Aegir Óskarsson: I totally agree with my colleague. The secretariat is well established in Tromsø. Of course it is weak for such a huge plethora of activities but I am sure that it will be strengthened in the near future. As in any organisation, there is hesitation about establishing a secretariat, but I think that it has come through with flying colours.

Q277 Lord Oxburgh: We have touched on the role of observers. It seems that the main way that they can be involved in the work of the council is through the working groups. Can you tell us a bit more about the working groups? How is their membership set up? Can members of the working groups contribute money to the budgets? It would be very helpful to hear more about that.

Else Berit Eikeland: Absolutely. That is a very important question when it comes to the Arctic Council, since the working groups are fundamental to the council. The working groups and the task forces, which are expert groups on specific topics, are open to all observers. As you know, the Arctic Council is very much a bottom-up forum. The working groups and what comes up from the groups to the ministerial meeting are very important. The working groups are not doing research; they are co-ordinating and carrying out peer reviews of research and science that has already been done. That is why observer states such as the UK with a lot of experience in Arctic research can really contribute in the working groups.
Observers can contribute to funding projects in the working groups and work with Arctic states on specific priorities.

**Lord Oxburgh:** So when one of these working groups is meeting, are all observers and members of the Arctic Council advised that there is going to be a meeting, and can anyone send anyone they wish?

**Else Berit Eikeland:** Yes, in principle, but there are six working groups. There are very many meetings held very far away and they are very costly. I think that most observer states—even the bigger ones such as China—will have priorities when it comes to participating in working groups. What areas are we specifically interested in? Is it biodiversity or other issues?

**Lord Oxburgh:** So the priorities are set by the observers and not by the Arctic Council itself, or not by the working group itself. People who are interested and are prepared to pay can come.

**Else Berit Eikeland:** Yes.

**Lord Oxburgh:** Good. Now, are the task forces set up by the council or by the working groups?

**Else Berit Eikeland:** The task forces are directly set up by the ministerial meeting. So the Ministers will decide that this year, or over the next two-year period, we will focus specifically on oil spill prevention—I am co-chairing a task force on oil spill marine pollution with my Russian colleague—and then all the observers will be invited to participate.

**Lord Hunt of Chesterton:** What proportion of these working groups have NGOs as opposed to national members? Are the NGOs about half the number of people involved in these working groups?
Else Berit Eikeland: It depends very much on the topic of the working group. For example, the working group CAFF is responsible for biodiversity, so some NGOs working specifically on biodiversity will participate. Some Arctic states will have that as a priority, as will some observer states with a keen interest. It depends a little on the topic, but Norway wants to work more with all observers. We would like to design projects with observers, not least with the UK as a close ally of Norway when it comes to research in Antarctica and the Arctic. It depends a little on the interest that observer states have, but it is important that we do not demand too much of observers, because the Arctic Council is a complicated structure. It has many meetings and, as I said, you need to participate. But observers cannot come to only one meeting in a working group and then come back next year, and expect to have influence. You have to have continuity and you need commitment.

The Chairman: Perhaps I could bring in Lord Soley. Then I will ask Ambassador Óskarsson whether he would like to respond on any of those points.

Q278 Lord Soley: I am trying to understand how you translate the thoughts or ideas of a working group into practical governance. You might have very good working groups, such as the one on oil spills or the massively important one on search and rescue, and I can see how they function, but I am not sure how you translate that into governance of the area.

Thórdur Aegir Óskarsson: I work daily with these issues. I am not sure how it works out, but we have important products such as the human development reports that have been produced by these working groups. They are of course a sound basis for any further policy-making. Have I misunderstood you, sir?

Lord Soley: If the working groups put forward proposals and the Arctic Council then agrees them, you then go to all the Governments, because it will not just be a matter relating to Arctic Council governance. If you have ships coming through from China to Britain or
whatever and the proposal is on search and rescue, for example, you will have a bit of major international governance.

**Else Berit Eikeland:** Thank you for a very difficult and relevant question. As you mentioned, a lot of the work in the Arctic Council may be difficult to understand because there are big reports and lots of information. Let me be very concrete. The working group CAFF is working on a huge project on migratory birds. A lot of the birds in the Arctic are declining rapidly, because of disappearing on their flying routes to the south. So CAFF has established close cooperation with the relevant countries on the eastern flight route, such as China, Korea and Singapore, to map these birds. We are developing international co-operation to do something about it. So, when it comes to migratory birds, we are researching new regulations and new areas of co-operation.

When it comes to the task force on oil spill prevention, we are looking at new forms of co-operation among Arctic states, not least when it comes to those states with offshore oil and gas activities. Those are two examples of how more scientific general information is translated by the Arctic states into new ways of co-operating and new regulation.

**Lord Soley:** So the Arctic Council would see its role as persuading other states if not to follow a law, because it would not be like the law of the sea convention of the United Nations, then to follow the arrangements that it is putting in place, whether on oil spills, bird migration or search and rescue. Is that how you see it working internationally?

**Else Berit Eikeland:** No, sir, that is not how I see it. When it comes to migrating birds, China, Korea, Japan and Singapore say that they have the same interest as the Arctic states in keeping these birds, so it is more a question of co-operation than of forcing national regulations. The Arctic Council is not in that situation. As you are aware, the Arctic Council is not able to decide binding agreements or to have an international agreement mechanism.
The Arctic Council, as I said, is more about soft power co-operation and engaging with other Arctic states and observers for the common good.

Q279 Lord Hannay of Chiswick: You have been very positive indeed about the co-operation between Norway and the UK. I wonder whether either of you could say anything about the areas in which you think the UK could most usefully work with the nations of the Arctic Council, what the strengths of the UK are as seen from the outside, and how active the UK is in the Arctic Council. We know that it has observer status, but we find it slightly difficult to identify whether it actually uses that very much. Perhaps you, as two members of the Arctic Council countries, could say what your view of that is. Are there other areas outside the Arctic Council where the UK should be active with Arctic states?

Thórdur Aegir Óskarsson: Perhaps I may start. We see basically three areas where the UK should come in stronger than it does, in particular the scientific work. You have heard that UK representatives have been attending the scientific working group to some extent but not very visibly. The second thing is the search and rescue aspect of Arctic co-operation, which is a critical issue for the future. The UK has great capacity and experience to contribute to that work. The third area is resource development. The UK has a lot of experience in different aspects of resource development in difficult places, so we believe that the UK could raise its profile individually much more than it does today.

Lord Hannay of Chiswick: But do you not notice some contradiction in search and rescue, because the UK’s capacity to operate search and rescue in the Arctic area is, I think I am correct in saying, being reduced?

Thórdur Aegir Óskarsson: It is the UK’s decision to reduce it. In the case of the Arctic, every additional hand with search and rescue experience in this huge area is welcome. But we also have experience from Canada, where the build-up of search and rescue capacities is not
following the politics of the issues. I can say even as an Icelander and an Icelandic representative that we are struggling with developing and keeping up our own capacity in the face of political issues.

**The Chairman:** How specifically should the UK help in search and rescue? This is an area where the Committee has shown a lot of interest, and I would be interested in your comments, Ambassador, on what practical assistance the UK could give in this area.

**Thórdur Aegir Óskarsson:** I believe that we are still on the basics in terms of identifying resources for operational help in the north, so we are at the beginning of identifying any possible capacity to contribute to and just to co-ordinate activities. Since the UK belongs to a near-Arctic group of countries, this is an issue that we are planning to take up in the bilateral consultations between Iceland and the United Kingdom.

**Q280 Viscount Hanworth:** We have lost our capacity for long-range aerial surveillance. Would the Ambassador be prepared to say something to encourage us to restore that capacity?

**Thórdur Aegir Óskarsson:** Of course, we have facilities in Iceland. We are centrally located and so have the search capacity to work out of Iceland. That is one of our dreams. One of our policy statements is to develop Iceland as a hub for such search and rescue capacity in the northern Atlantic.

**Lord Hunt of Chesterton:** The fact is that a lot of the activity there is associated with oil and exploration. Are the companies that are operating in the Arctic contributing to this infrastructure? Is the tourist industry, with its big ships, also contributing to it? You could ask why an ordinary taxpayer who is living in England should be contributing when there are some very large companies making a lot of money. Why are they not contributing? Is the Arctic Council addressing the real role of the contribution by business to this infrastructure?
Thórdur Aegir Óskarsson: I am not aware of it, but my colleague might have more details. Of course, our coastguards are working very closely on co-ordinating possible activities when it comes to accidents in the Arctic, and that is one thing that we can add to the co-operation. We have also increased tourism there. There has been an exponential increase in the number of cruise ships going north over the past few years. That is another risk that can affect even British interests.

Lord Hunt of Chesterton: They could contribute their money to this infrastructure.

The Chairman: Ambassador Eikeland, did you wish to make a short contribution on this?

Else Berit Eikeland: Yes. Maybe the most important issue for me to underline here is that we would like to engage even more with the UK in the Arctic Council. I do not think that it is up to Norway to decide the priorities of the UK. The panel before us pointed out very important areas of co-operation. When it comes to search and rescue, for Norway it is partly for our coastguard and partly for us as a sovereign state to control these areas. It is a matter of principle and there is a bigger question to discuss. But the most important thing is that we feel that the British Arctic strategy was very well received in Norway. We know that the FCO participates at senior Arctic official meetings, and we know that there is a wish for the UK to participate more in working groups. But, to be blunt, if you are going to participate, you need more predictable funding.

The Chairman: Do we chair any of the working groups, Ambassador, do you know?

Else Berit Eikeland: No.

The Chairman: No we do not, or no you do not know?

Else Berit Eikeland: No, I do not think that you do.²⁰

²⁰ Note from the witness: Observers do not chair the working groups of the Arctic Council.
The Chairman: Thank you. That is very useful.

Else Berit Eikeland: I think that the message from Norway would be: yes, we would like to work more with the UK. You have a lot of competence and you have experience in Antarctica and the Arctic. This synergy would be relevant to the Arctic Council.

The Chairman: I want to raise briefly something connected with this. We take an interest in the defence side. Clearly, Norway is a very important member of NATO. British Armed Forces have trained in the high north with Norwegian forces. Does Norway see the military area—having an Arctic capability—as important as well? I do not want to get into a long discussion about this, but Norway has a particular position here as a NATO member in the high north.

Else Berit Eikeland: Absolutely. Since the Second World War we have felt that we have a special relationship with the UK because of the war and because of the close links in NATO. We do not want security questions to be discussed in the Arctic Council. We want the Arctic Council to have a different focus with Russia.

The Chairman: I was not really asking that within an Arctic Council context. We are looking not just at the Arctic Council but at broader Arctic issues.

Else Berit Eikeland: Yes, the partnership between Norway and the UK in NATO is very important.

Q281 Lord Addington: How will dialogue and debate on the Arctic be influenced by the Arctic Circle conference? I was there just over a week ago in Reykjavik. Does the Arctic Circle conference present an alternative forum to the Arctic Council for seeking influence in the region? In many of your previous answers we heard that Norway regards the Arctic Council as something of a soft power. Surely this complements it, or does it possibly rival it? Could both of you clarify that?
Thórdur Aegir Óskarsson: That is a very valid question as we had the Arctic Circle meeting in Iceland only a week ago, where we had the pleasure of receiving a very robust Arctic UK delegation with a good mixture of business, academia and politicians. To see the Arctic Circle as anything but a dialogue forum is wrong, because it will always be a forum in which to raise important issues regarding the Arctic, in whatever area it is. As was clearly shown at the last Arctic Circle meeting, the issues that were addressed were very broad and detailed. It was an amazing experience for me to be there and to see how complicated the issues facing and relating to the Arctic are. The main proponents of this forum insist that it is a forum for raising issues for future policy-making or policy decisions.

Else Berit Eikeland: Maybe I can add some comments. I agree very much that the Arctic Circle conferences and other conferences—I must mention the Arctic Frontiers conference in Tromsø—are all kinds of this soft power, this dialogue on Arctic issues. Of course, Norway welcomes all types of forums and conferences on Arctic issues. The Arctic Council is very different - it is about long-term co-operation among Arctic states and Permanent Participants. UK participation in the Arctic Council would be very different from UK participation in a conference. But I agree very much that all this is part of this new map of soft security policy discussions in an Arctic framework.

The Chairman: Thank you. Perhaps we can move back to fisheries with a question from Viscount Hanworth.

Q282 Viscount Hanworth: My question concerns an issue that has already been raised. What consideration have Norway and Iceland given to the need to conserve and manage fisheries in Arctic marine areas?

Else Berit Eikeland: Thank you so much for raising what is a very important question for Norway. When it comes to fisheries management, Norwegian policy is very much
ecosystem-based and science-based. We have dual use of our resources and our coastal areas. We have a system of integrated management plans for all our big ocean areas. For example, there is close science-based co-operation with Russia in the management of fisheries resources in the Barents Sea. It is science-based. Even though there is offshore petroleum activity in this area as well as shipping, the cod quota last year was four times bigger than 25 years ago. These integrated ocean management plans for the Barents Sea, the Lofoten western area and the Norwegian Sea involve detailed science-based mapping of the sea bed and of fish spawning, identifying sensitive areas where offshore oil and gas are not allowed and where there will be only fisheries. To sum up, a science-based approach to fisheries is key for Norway.

**Lord Hannay of Chiswick:** Can I just follow that up and ask how you approach the possible regulation of fisheries in the area that is not covered by the EEZs of the Arctic Council states?

**Else Berit Eikeland:** Thank you. We have a precautionary principle in non-regulated areas. That implies that Norwegian fishermen are not allowed to fish in those areas. As you are aware, a process has been initiated by the United States to have a precautionary principle agreement among the coastal states. We very much support this.

**Lord Hannay of Chiswick:** But presumably you do not believe that the coastal states alone can regulate fishing or the high seas outside the EEZs. That is not something that the coastal states have any legal rights over.

**Else Berit Eikeland:** What I tried to express—I am sorry that I was not clear—is that we do not currently look at regulations; we look at the precautionary principle not to allow fishing in these areas because there is almost no science and, as I mentioned, the Norwegian approach to fisheries is science-based.
The Chairman: Can I just get something clear in relation to what Lord Hannay said? Is it the Norwegian position that in the high seas outside the EEZs there should be a moratorium in fisheries in the Arctic? Is that what we are saying?

Else Berit Eikeland: I am saying that we want a precautionary approach to fisheries in these seas.

The Chairman: Does that mean a moratorium in the medium term because we do not have the scientific information?

Else Berit Eikeland: A moratorium in the legal sense is very different from a precautionary approach.

The Chairman: But a precautionary principle is not a practical outcome, is it? A policy is driven by whether you allow fishing or not.

Else Berit Eikeland: In the Norwegian setting, when it comes to science-based management of fisheries, a precautionary approach is key.

The Chairman: I understand.

Viscount Hanworth: My question concerns whether there is a need for an international approach to the conservation of fish stocks. The economists who speak of the tragedy of the commons assert that the problem of fish stocks is the absence of specific national ownership. There is a history of British-Icelandic relationships that informs this particular question, is there not?

Thórdur Aegir Óskarsson: There is, of course, particularly in the case of the cod wars—we have a very strict view on that. Fisheries need to be managed. On the other hand, we have a different issue with the five coastal states. We regard Iceland as a coastal state in this sense but we have been excluded from the consultations and from the work of these so-called five coastal states. We have demanded to be part of the group but so far that has not happened.
Viscount Hanworth: Has not the problem with the EU fish stocks been the commonality of ownership, which has meant that everybody has been trying to grab more than their fair share? Do you not see this problem arising in precisely the area that we are talking about?

Thórdur Aegir Óskarsson: I am pretty sure that we already have a sign of the problem in the form of the mackerel issue. The fish stocks are moving north, and Iceland now has a population of mackerel in its economic zone that feeds and spawns there.

Lord Hunt of Chesterton: There is an international treaty about fisheries in this area, although I have forgotten its name. It concerns the regional fishing area and includes almost all of the Arctic area. I thought that that more or less had a controlling role.

Else Berit Eikeland: Absolutely.

Lord Hunt of Chesterton: So that is how you work. What is the name of that treaty?

Else Berit Eikeland: NEAFC. It is a regional-based fisheries organisation.

Lord Hunt of Chesterton: It is the body that applies the precautionary principle through its decision-making and regulations?

Else Berit Eikeland: Absolutely. You are correct.

Lord Hannay of Chiswick: But surely that is not correct. It does not cover the high seas that may be uncovered by the melting of the ice cap. NEAFC, as it is currently constituted, does not do that, so there is a vacuum.

The Chairman: We need to finish within about four minutes, so perhaps we could move on to Lord Hunt’s question. If we do not finish, perhaps we could do so through written evidence.

Q283 Lord Hunt of Chesterton: This is to do with economic and industrial development. You have told us about the Arctic Council and the Economic Council, but one of the other aspects that we have heard a lot about is shipping, gas and other mining. To what extent is your
decision-making through the Arctic Council or others connected to the United Nations bodies? We have not heard from you about the International Maritime Organization, which is responsible for both safety and pollution. I think that some people are very worried about shipping in that area. They are worried that the current level of pollution regulation has not been as rigorous as it might have been. This is an area that will be contaminated. Does the Arctic Council have a particular way of working through the IMO, or is that done separately?

The Chairman: Perhaps I could ask both of you, Ambassadors, to answer Lord Hunt’s question and the wider question that we gave you some notification of, and then, if something is not covered, you could come back to it in written evidence afterwards. Ambassador Eikeland, maybe you would like to start.

Else Berit Eikeland: Thank you. When it comes to the IMO, the Arctic Council supports the work in the IMO to develop a Polar Code. We are very much aware that the Arctic Council should not duplicate the work of, or work in parallel with, the IMO or other international bodies where the Arctic states are represented. We will discuss a Polar Code in more general terms and then representatives from the Arctic states will work together in the IMO to develop such a code. I think that we can find many examples of co-operation inside the UN.

Thórdur Aegir Óskarsson: I totally agree that we are seeing good progress on integrating the Polar Code into two relevant agreements in the IMO. Of course, the IMO has a legal basis that the Arctic Council does not have.

Viscount Hanworth: Might I encourage you to submit additional written evidence regarding your fish stock management?

Thórdur Aegir Óskarsson: With pleasure.

The Chairman: I am aware that we have not really gone through balancing oil, gas and mining, which is really important. We would be very keen to have some written evidence on
that area from you if that is possible. I would like to bring the session to an end now. We have covered a large area. I am aware that we have questioned you both closely and I thank you very much for your considered responses. Your Excellencies, thank you very much for travelling and attending here. We will be producing our report in February. We look forward to the UK playing a full role in the Arctic and in the Arctic Council and the various other bodies of which we are a member. Thank you very much indeed. I bring this public session to an end at this point.
This presentation is submitted as supplementary written evidence to the House of Lords Arctic Committee following its session of Tuesday 25 November 2014.

THE ARCTIC
AS A GLOBAL ISSUE
AND JAPAN’S CONTRIBUTION

Ministry of Foreign Affairs of Japan November 2014
ONGOING CHANGES IN ARCTIC

The Arctic is now facing significant environmental changes caused by advancing global warming.

During the hundred years in the 20th century, the average global temperature rose by 0.74 °C, while it rose by more than 2 °C in the Arctic.

【The 4th Assessment Report of IPCC】

(Source: IPCC)
ONGOING CHANGES IN ARCTIC

- Changes caused by the global warming include:
  - Reduced Arctic sea ice
  - Melting of permafrost, ice sheets and glaciers on land

Sea ice distribution in the Arctic Ocean (AMSR-E, AMSR-2 data: JAXA)
Issues to be Tackled

Acceleration of the "Arctic Amplification"

- Declining Arctic sea ice with high reflectance
- Melting of ice and permafrost
- Increased absorption of solar heat
- Emission of methane

Acceleration of global and Arctic warming

Ocean acidification could affect the entire marine ecosystem.

Dissolution of shell of the sea butterfly in the Arctic ocean
The environmental changes in the Arctic present the international community with new economic opportunities.

- Emerging new shipping route between Asia and Europe
- Possible exploitation of presumed energy resources
However, in exploiting these opportunities, possible impacts over the vulnerable natural environment in the Arctic must be carefully examined.

Ice of Greenland covered with black carbon

Oil spill accident
TWO-SIDEDNESS

Environmental changes in the Arctic have

① Regional aspect: phenomena occurring within geographical range of the Arctic
② Global aspect: their impact reaches out to the entire world

The challenges and the opportunities surrounding the Arctic are both **regional and global**.
NECESSITY OF INTERNATIONAL COOPERATION

- Two important challenges before us:
  1. To grasp what is going on in the Arctic and its impact on the global environment.
     Precisely predict further changes and take necessary measures to tackle negative impact.
  2. To reach a common understanding on appropriate manners of economic use in the Arctic.

- Addressing these challenges requires:
  - Respect for the centrality of regional states and Arctic indigenous peoples
  - A wide range of international cooperation
PREREQUISITE FOR INTERNATIONAL COOPERATION

- To ensure that actions taken in the Arctic are based on the "Rule of Law"
  - Japan welcomes that territorial disputes and maritime delimitation issues in the Arctic have been settled peacefully in accordance with the international law.
  - Relevant international law including UN Convention on the Law of the Sea (UNCLOS) needs to be applied to the seas around the world including in the Arctic Ocean.
  - Principles of international law including the "freedom of navigation" need to be respected therein.
  - In the Arctic Ocean, with its characteristic as ice-covered area, appropriate balance needs to be achieved between such principles as freedom and safety of navigation and protection of marine environment.
JAPAN: NEIGHBOR OF THE ARCTIC REGION

- Japan’s policy of “Proactive Contribution to Peace”
- Long history of scientific observation and research in the Arctic for more than 50 years

< Examples of accomplishments >

- Leading role in elucidating the Arctic Ocean acidification
- Scientific analysis on ongoing environmental changes in the Arctic (ex. Earth Observation Satellite “Shizuku”)

- Japan’s advanced science and technology will greatly contribute to:
  - Elucidating ongoing change in the Arctic
  - Elaborating measures to be taken
  - Minimizing risks involved with increasing human activities
  - Realizing economic use of Arctic in a way beneficial to the entire international community.
JAPAN’S SPECIFIC INITIATIVES

➢ To address global warming as underlying cause of environmental changes in the Arctic;
  - In 2007, Prime Minister Abe proposed a goal of reducing global greenhouse gas emissions by 50% by the year 2050.
  - In 2014, Prime Minister Abe introduced Japan’s new actions with following three key concepts at UN Climate Summit.
    ① Support for developing countries
    ② Technological innovation and diffusion
    ③ Contribution to the international framework

INNOVATION is the key to achieve this goal
JAPAN’S SPECIFIC INITIATIVES

- Establishment of **Innovation for Cool Earth Forum (ICEF)** (Oct 2014)
  - International forum to assemble global wisdom from business, public and academic sectors
  - The first conference was held in Tokyo with about 800 participants from as many as 80 countries and regions.
  - Japan will host this forum every year.

Promote innovation in the energy and environmental fields
JAPAN’S SPECIFIC INITIATIVES

Unravelling facts on Arctic warming

- We need to understand, analyze and predict impact of chemical substances with greenhouse effects. (ex. methane and black carbon)

Greenhouse gas observations in high-latitude region including the Arctic

Analysis for long-term variation in greenhouse gases (CO2 and CH4) using a tower network over Siberia by National Institute for Environmental Studies (NIES)
JAPAN’S SPECIFIC INITIATIVES

➢ To elucidate impacts of ocean acidification on marine ecosystem;

• Deployment of Research Vessel "Mirai" to the Arctic Ocean
• Promotion of international joint research with Arctic states
• Accumulation of underwater survey experiences utilizing an autonomous underwater vehicle (AUV) "Urashima"

Achieving a breakthrough innovation to develop a new AUV capable of conducting surveys even under the harsh conditions of the Arctic Ocean will be the next challenge.

URASHIMA: an autonomous robot for deep sea exploitation, which was developed by JAMSTEC.
JAPAN’S SPECIFIC INITIATIVES

➢ To mitigate risks involved with increasing human activities;
  - A variety of information on underwater condition of the Arctic Ocean like ebb and flow, ocean current and submarine topography needs to be collected.
  
  The underwater technology for studying marine ecosystem in the **Arctic** could eventually be used to gather such information.

- Japan launched a project for developing an “**Arctic Navigation System**” by integrating related information like the followings;

  ![Thickness of sea-ice](image1)
  ![Speed of sea-ice movement](image2)
  ![Sea Ice Prediction (Short-term)](image3)
  ![Mid-term Prediction](image4)
  ![Observation by satellite](image5)
ADVANCING INTERNATIONAL COLLABORATION/COOPERATION

Establishing a center of education and research in each Arctic state
ADVANCING INTERNATIONAL COLLABORATION/COOPERATION

- Arctic Science Summit Week (ASSW) (23 to 30 April 2015, Toyama, JAPAN)
  - 25th anniversary of International Arctic Science Committee (IASC)

- Further contribution to the Arctic Council (AC) in related working groups and Task Forces
Research Collaboration on Arctic Science Between UK and Japan

November 2014
Outline of Arctic Research

- Recently, with the sea ice cover in the Arctic retreating at an unprecedented rate, countries around the world are trying to understand the role played by the Arctic in global climate change, which would help project sea ice distribution in the future to access the potentials of sea routes in the Arctic ocean.

- In Japan, research institutes and universities, such as National Institute of Polar Research (NIPR), Japan Agency for Marine-Earth Science and Technology (JAMSTEC) and Japan Aerospace Exploration Agency (JAXA), have individually been conducting the Arctic researches in their respective specialized fields.

- The Japanese government, the Ministry of Education, Culture, Sports, Science and Technology (MEXT), initiated the National Arctic Research Project in JFY 2011 both to achieve the highest standard of research in the world and to promote training and development of human resources in the field.

Sea ice distribution in the Arctic Ocean (AMSR-E data: JAXA)
Arctic Research Activities of Japan

- **Research Institutes**

  **National Institute of Polar Research (NIPR)【Atmosphere・Land】**
  NIPR established the Arctic Environment Research Center in 1990. As Japan’s core research institution of the Arctic research, the center conducts observational activities, such as the auroral, atmospheric and snow ice observations, based in the observation station on Svalbard in Norway.

  **Japan Agency for Marine-Earth Science and Technology (JAMSTEC)【Ocean】**
  JAMSTEC conducts research on the actual conditions and changes, and the changing processes in the ocean, snow ice, atmosphere, and land systems in the Northern Hemisphere chill area.

  **Japan Aerospace eXploration Agency (JAXA)【Observation from space】**
  JAXA offers the observational data complied by satellites, such as a water cycle change observation technological satellite and a greenhouse gases observing satellite in the Arctic Circle.

- **National Project**

  **Arctic Climate Change Research Project “Green Network of Excellence (GRENE) Program” (2011 - 2015)**
  GRENE promotes research activities through collaborations among researchers.
Strategic Promotion for Arctic Research

- Japan’s Arctic research and Observations
  - **Strengths**
    - Comprehensive research area
    - Satellite, ocean monitoring, simulation technology
  - **Weaknesses**
    - Stakeholders involvement
    - Trans-disciplinary approach
    - Proactive approach for international cooperation

- Prioritizing various values including science merit
  - Strengthening bilateral and multilateral research cooperation in strategic area
  - Contribution to adaption & mitigation measures for non-arctic area
  - Contribution to cutting edge technology development
  - Fostering younger researchers

- Strategic approaches
  - Strengthen research cooperation in key area for Arctic Council (AC)
    - Ocean acidification
    - Black carbon and methane
    - Close collaboration with related ministries
  - After JPFY 2015, MEXT will start a new Japanese initiative for Arctic Research:
    - Further enhance International Cooperation
    - Strengthen Function of JAMSTEC and Observing Technology for the Arctic Research
Arctic issues affect in Northern Hemisphere and the global

- No part of the Earth’s climate system is independent from the rest.
- Environmental change in the Arctic affect not only in the Arctic region but Northern Hemisphere and the global.
- Arctic issues are directly related to Non-Arctic countries such as UK and Japan.
Collaboration between UK and Japan

- To link the activities for the Arctic with the initiative of the global scale, the importance of the cooperation with non-Arctic countries as UK will increase in the near future.

- Furthermore, we hope to lead the International discussion of the Arctic issue by the collaboration between UK and Japan.

- Through the joint meetings, such as the UK-Japan workshop for Arctic science and technology to be held at British Embassy Tokyo on 18-19 November, we are convinced that the partnership in Marine-Earth Science and Technology between UK and Japan will be enhanced further.

18 December 2014
Examination of Witness

Matthew King, Head of Unit C1, Maritime Policy, Atlantic, Outermost Regions and Arctic, Directorate-General of Maritime Affairs and Fisheries, European Commission

Q250 The Chairman: Mr King, welcome to the House of Lords Select Committee on the Arctic. We have just had a session on biodiversity with witnesses from WWF, and we are very keen to move on to fisheries and the broader European Union area. You have had a list of our own interests, I hope.

Matthew King: Yes.

The Chairman: Perhaps I could ask you to introduce yourself. Then, if you are happy, we can move straight into questions, unless there is anything specific you want to say beforehand.
Matthew King: No, that is fine. I am Matthew King. I am an official at the European Commission and I am in charge of the unit in the Directorate-General for Maritime Affairs and Fisheries that is responsible primarily for the Arctic, the Atlantic and the outermost regions of the European Union.

The Chairman: I am aware that the questions are quite broad on some European policy issues, and if there is anything that you do not feel is completely in your area we will be very happy to have written evidence from the Commission following this session.

I will start by asking you how European Union policy towards the Arctic region has developed and evolved in recent years, and what the current priorities are for the EU in the Arctic. I suppose I am asking that within the context that clearly a number of the Arctic Council members are also members of the European Union but others are not, so the Arctic is partly an internal EU issue and partly an external affairs issue. We are interested in your views.

Matthew King: Indeed. Thank you very much, my Lord Chairman. The policy towards the Arctic is not solely about the Arctic Council, but let me begin by explaining a little of the evolution of EU policy towards the Arctic. In 2008 we made a first policy statement that looked tentatively at how the EU could become involved in the work of the Arctic Council. We considered such issues as the broader governance of the Arctic as an area. Governance may not be such a good word; stewardship is possibly a better word. The policy statement was well received by the European Parliament and by the Council of Europe, the council of the member states of the EU, which both issued their own statements on the Commission’s policy work, but I think that our policy towards the Arctic and our endeavours to become observers in the Arctic Council were slightly derailed by the enactment in the European Union of a ban on the import of seal products in 2009-10. I know there is a second question...
on that, so perhaps we can come to that in more detail later. That made us a lot more aware of the interests and competing politics and polities engaged in the Arctic and we took a step back, although we had made a formal request for observer status on the Arctic Council. In 2012, on the basis of some further policy reflection, the Commission, and the High Representative for Foreign Affairs and Security Policy, Baroness Ashton, and Commissioner Damanaki, issued a second policy statement that reviewed and superseded in some sense our 2008 effort. We tried to make a much more positive contribution to the work of the Arctic Council, and we wanted to put our best selves forward so that other Arctic Council members would be aware of the work that the European Union is currently doing and continues to do in the Arctic, notably in the research contribution that we make.

We also understand, of course, that the European Union has a huge environmental impact in the Arctic. Our footprint is quite considerable in black carbon terms, and we have some responsibility for that. We are also aware, of course, that there are untapped potential resources in the Arctic area, and while most of them may reside within the exclusive economic zones of Arctic Council members today, a significant proportion of the Arctic is the high seas and is therefore not subject to any international jurisdiction except the UN Convention on the Law of the Sea.

We are also trying to build up relations bilaterally and collectively with Arctic Council members. We have made a more significant effort in that sense through attendance at Arctic Council meetings and working groups, and we have embarked on a dialogue with indigenous peoples of the Arctic, who are significant political players in the Arctic Council itself. The journey, however, has not yet finished. At the last ministerial meeting of the Arctic Council, the EU’s application for observer status was positively received. However, formalisation of
the EU’s observer status was dependent on a successful resolution of the seal ban issue with Canada. Again, we might come to that in a second question.

Going forward, the EU’s observer status on the Arctic Council is somewhat in limbo, but with the new Commission just having taken office three days ago we are in the process of re-evaluating where we want to go with our Arctic policy over the next few years. The Council of Europe, the council of member states, has requested the Commission to come forward with yet another policy statement on the Arctic by the end of 2015. As we move towards that date, we have launched a public consultation to seek the views and advice of stakeholders in the Arctic, and of course of member states, which are observers themselves on the Arctic Council.

In a certain sense, Arctic Council observer status is one strand that could be a fruitful strand of Arctic policy, but there are other things that the European Union can and will continue to do, I imagine, in the Arctic context. We are major development donors in the Arctic region, of course mainly in the—shall we say European—zone of the Arctic, from Greenland to western Russia, and I think we need to consider how we can maximise the bang for our buck from all the European investment programmes that benefit northern Europe and the Arctic, especially Greenland. We have exclusive competence for fisheries management in the European Union—or rather, I should say, for the conservation of biological resources at sea. Fisheries could be a significant issue in the Arctic in future years. We are also developing a Northern Dimension policy with, among others, the Barents Euro-Arctic Council, and there is an EU strategy for the Baltic Sea region, for example, so we may consider other strands to our Arctic policy that are not dependent solely on the Arctic Council.
The Chairman: Thank you. Obviously Arctic policy involves not just EU member states but the EEA as well. Are they integrated into Arctic policy? Of course the EEA affects mainly the single market and not fisheries, but just very briefly, how do those two connect?

Matthew King: We have significant bilateral relations with Norway and Iceland on fisheries and Arctic issues, but when it comes to a Commission policy statement that policy statement is delivered to the member states of the European Union.

Q251 Lord Hannay of Chiswick: There is something rather anomalous—I imagine you feel that too—in the issue of observer status being taken hostage, as it were, in the first place by the Canadians over the seal ban and possibly now by the Russians over the sanctions that were imposed as a result of their seizure of Crimea and their destabilisation of eastern Ukraine. Yet around the table in the Arctic Council, which is not so far accepting EU observer status, are a number of countries that are party to the seal ban and to the sanctions. That does seem to me to be a little anomalous. The EU is not some extraterrestrial organisation floating out there; it consists of 28 member states, of which quite a few are there and quite a few are also observers. Do they never point out this anomaly?

Matthew King: Thank you for your question, my Lord. Indeed they do. The issue with the Arctic Council, however, is that it is a consensus-based organisation, and there is a sense that while Russia has enacted its own seal ban—and the US has had one in place since the 1960s I believe—it was the EU seal ban that had the most economic but also emotional impact, I believe, on the indigenous peoples of Greenland and northern Canada. There was a sense that the EU was too big for the Arctic Council to swallow, so together these issues resulted in some concerns. But of course where you have a consensus organisation and where some member states of the EU are enjoying privileged access and membership of such an
international organisation, there is a sense that it is possible to look two ways on an issue. As it is, we have made our position very clear at the highest levels to the Russian and Canadian authorities, and we shall see what comes of that in time.

The Chairman: We will come on to the seal ban later in question 3.

Q252 Lord Soley: Can you explain how the Northern Dimension—the European Union plus Russia, Iceland and Norway—fits into the EU’s Arctic policy, and can you explain particularly the problems of overlap, or of any interaction between the Northern Dimension and the Arctic Council?

Matthew King: I will be very brief in my answer here, and if possible I will supplement my answer with written evidence later. The two are designed to be complementary. The areas of overlap relate quite simply to the funding available, mostly for northern Russia, through the Northern Dimension environmental fund. The EU has, with other members of the Northern Dimension, put around €100 million on the table so far for the environmental clean-up of northern Russia. Similarly, the Arctic Council has about €10 million available for the same sort of projects, so there is a risk of overlap there unless the two are co-ordinated. The Northern Dimension accepts the Arctic Council as an observer in its work, but I would not like to comment beyond identifying that potential area of overlap.

Lord Soley: It is an important area for the Committee and the Chairman, and more evidence on the relationship between the two would be very useful.

Matthew King: Indeed, and I shall provide further submission.

Lord Tugendhat: Perhaps I may come back to the question touched on by Lord Hannay, along with the question that has just been asked. Can you say a word about how Denmark plays its
hand on these discussions? Does it play a leading role in council discussions on the subject or does it see itself as some form of bridge builder? How does Denmark play its hand?

**Matthew King**: Denmark acts in the Arctic Council on behalf of Greenland and the Faroe Islands because of its foreign policy competence for those members of the kingdom of Denmark. There is bridge-building, yes, but it is clear that Denmark’s interests—it is difficult for me to speak for Denmark; this is an opinion—reside mainly in ensuring that resources in Greenland are well managed. Uranium and other mining resources are to be found there, along with significant fisheries. Its own relations with the US, Canada and Russia on a bilateral basis and are of course extremely important. Naturally it has supported the EU’s application for observer status, but it is difficult to say how much influence it is possible for individual member states to have—I would include Sweden and Finland in that comment—given the previous strong opposition by Canada and what appears today to be quite an entrenched Russian position.

**The Chairman**: Baroness Browning, I think we have covered a little of your area, but I am sure that you have other questions.

**Q253 Baroness Browning**: Perhaps I may move on to other aspects of the seal ban. Following the determination of the WTO, I understand that Inuit seal skins are perceived as being a quite separate commodity for marketing from the overall ban, which deals with the east coast seal hunt. I gather that discussions have been held recently in order to work through what the WTO determination requires and that there has been some progress, although no timescales have been set. How realistic is it that the Inuit seal skins will be identified so that they can be verified as a separate commodity? Also, after all the publicity, are they ever likely to regain the marketplace position in Europe that seal skins once had? In
other words, is this going to be a solution to the EU’s application for observer status or is it just being dragged out as a bit of a red herring?

Matthew King: It is certainly part of the solution to the EU’s observer status. The EU’s discussions with Canada on the seal ban are now concluded. At a recent EU-Canada summit a statement was issued following some negotiations in which, following the WTO ruling, Canada has agreed to make use of the exemption that exists under the EU seal ban regulation to allow the import of indigenous, traditionally caught seal skins into the EU. In practical terms, some work needs to be done for that to happen. The Canadian authorities need to identify an organisation that will be responsible for tracking and tracing the indigenously captured seal skins. Whether that will be done in short order is anyone’s guess, but the Canadian Government have clearly said that they are no long
European Commission – Supplementary written evidence (ARC0064)

This submission is made to supplement the oral evidence given by Matthew King on 4 November 2014. It covers the issue of the interactions and synergies between the Northern Dimension and the Arctic Council.

The Northern Dimension (ND) is a joint policy of the European Union, Russia, Norway and Iceland. Sectorial cooperation and project activities are structured under ND Partnerships on environment, transport and logistics, public health and social well-being and culture. The ND framework includes also the ND Institute and the ND Business Council. According to the ND Policy Framework document of 2007, the ND covers "a broad geographic area from the European Arctic and Sub-Arctic areas to the southern shores of the Baltic Sea, including the countries in its vicinity and from North-West Russia in the east to Iceland and Greenland in the west". Equality of the 4 ND partners and co-financing of its activities are the basic ND principles. (http://eeas.europa.eu/north_dim/index_en.htm; http://www.northerndimension.info/)

The Northern Dimension offers the EU a framework to advance the EU's Arctic objectives in the European Arctic area together with the ND partners, in particular in the fields of environmental protection and nuclear safety and improving transport and logistics through the respective partnerships (see: www.ndep.org; www.ndptl.org). Also other ND structures can give an important contribution in this regard.

There is active exchange between the structures of the Arctic Council (AC) and the ND, including regular meetings between the secretariats to help ensure coherence. The representatives of the Arctic Council participate in various ND meetings and the AC has a participant status in the ND itself alongside the other regional councils in the north (The Council of Baltic Sea States, Barents Euro-Arctic Council and Nordic Council of Ministers). The importance of complementarity and coherence between the work of the regional councils and ND has been regularly highlighted in ministerial meetings such as the previous ND ministerial meeting on 18 February 2013. The ND ministerial also called for developing further the ND’s contribution to cooperation in the European Arctic area and this issue is currently under preparation (http://europa.eu/rapid/press-release_PRES-13-63_en.htm).

The project pipeline of the Northern Dimension Environmental Partnership includes projects in the Arctic regions of North-West Russia (http://ndep.org/projects/). The Arctic Council Project Support Instrument (http://www.nefco.org/financing/arctic_council_project_support_instrument) has recently approved projects in the same geographical area. It is worth noting that the actions financed by the two structures are of different scale. Project preparation and selection should be well coordinated since both structures involve many of the same IFIs and donor countries.

December 2014
REGIONAL DEVELOPMENT IN THE ARCTIC: THE SCOPE FOR INTERNATIONAL COLLABORATION ON TERRITORIAL COOPERATION

PREAMBLE

This paper has been drafted in response to the House of Lords Select Committee on the Arctic’s call for evidence as issued on the 22nd July 2014. The contribution is relevant to all eight questions formulated in the call:

Summary point 1 relates to identifying ways in which regional cooperation can address the impact of changes in the Arctic (question 1) and the importance of local communities (question 4);

- Summary point 2 and 5 identify ways in which UK regional actors can interact with Arctic governance structures (question 8)
- Summary point 3 and 4 reflect on what commercial and non-commercial opportunities there are for cooperation with Arctic partners at the regional level (question 2);
- Summary point 1, 3, 4 and 5 focuses on ways regional cooperation can contribute towards balanced economic development (question 3); how the UK can contribute to supporting climate change adaptation and mitigation strategies (question 6) and support stewardship in the region (question 7)
- Summary point 5 also reflects on ways on how to share data and exchange knowledge (question 5) to improve policy making

Each summary point is further expanded on in subsequent sections of the report. Extensive detail in relation to each point can be found in the supplemented documents.

SUMMARY

1. Regional and local dimensions of changes in the Arctic - The Arctic is an area of growing strategic importance and the subject of intense political debate on issues such as climate change, resource management and accessibility. Much of the focus has been on the geopolitical, strategic, commercial and scientific issues at a ‘macro scale’ with less consideration of the regional and local dimension, notably the varied implications and impacts of resource exploitation and environmental change on local communities.

2. Institutional frameworks - Policy responses to the challenges of regional and local development are complicated by two features of the institutional framework. On the one hand, there is a dense ‘institutional landscape’ of organisations, representative bodies and development programmes with Arctic interests. On the other hand, there are obstacles to effective cooperation on regional and local development issues among

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Authors: Dr Arno van der Zwet (EPRC), Dr Irene McMaster (EPRC), Professor John Bachtler (EPRC), and Mr Frank Gaskell (Integritas Liason)
institutions and programmes in the form of capacity constraints, insufficient flexibility to respond to rapid changes in the external environment, weaknesses in knowledge sharing, and inability to exploit synergies.

3. **Shared challenges** - Many of the economic, environmental and community challenges facing the Arctic region are shared with other peripheral regions. A number of regions in the UK have shared interests in finding solutions on issues related to harsh climatic conditions, inaccessibility, remoteness, outward migration and low density in public service provision. These commonalities have in the past and can continue to form the basis for mutually rewarding regional cooperation with Arctic partners. Furthermore, as the region is subject to huge, and often conflicting international interests and pressures, engagement on practical issues are vital and practical collaborations and cooperation with stakeholders in the region and based on shared interests have proved valuable in building and reinforcing links with the region.

4. **The role of territorial cooperation programmes** - A promising basis for addressing these weaknesses is provided by the EU ‘territorial cooperation programmes’ (funded partly by the EU and partly by national public authorities and private sector bodies) which have the remit of promoting cross-border and transnational cooperation on regional and local issues. Among those in which UK authorities have a direct interest are the Northern Periphery and Arctic Programme and the North Sea Programme, both of which have Arctic interests and (along with similar programmes like Atlantic Area Programme) are currently developing programmes for the 2014-20 period.

5. **The scope for international collaboration on territorial cooperation** - Scottish Government, in collaboration with the Norwegian Government, and other UK and international partners has taken the initiative to improve information flows, knowledge-sharing and capacity development on regional and local development in the Arctic and near-Arctic among programmes and institutions. The aim of the emerging ‘ARC-NET’ initiative is to enhance the relevance of territorial cooperation in the Arctic and near-Arctic; to improve the management and delivery of territorial cooperation intervention; to facilitate data and knowledge sharing among Arctic regional actors; and to increase the impact and added value of projects and programmes.

**INTRODUCTION**

The Arctic is an area of growing strategic importance and the subject of intense political debate on issues such as climate change, resource management and accessibility. The region is subject to a rapidly changing and complex policy environment which aims to address the often contradictory goals of economic development opportunities and environmental challenges as well as managing the impact on local communities. The regional dimension plays an important role in developing economic opportunities in the region that are environmentally and culturally sustainable. Territorial cooperation at the regional level offers opportunities for Arctic and near-Arctic actors to engage in lesson learning, information sharing and the development of projects that offer joint products and services.
The information in this briefing note is based on research projects carried out by the European Policies Research Centre (EPRC) at the University of Strathclyde, Glasgow. EPRC has a track-record of research on territorial cooperation and regional development activities across the Europe, in particular in the Nordic countries. Much of EPRC’s research is commissioned by: national and regional governments; European Territorial Cooperation (ETC) programme authorities; and the European Commission.

The attached reports were drafted as part of two specific projects. The first, the Arctic Dimension in the Northern Periphery: Perspectives from Scotland Ireland and Northern Ireland, was drafted as part of a Northern Periphery Programme preparatory project. It considers how the Arctic can feature in the 2014-20 Northern Periphery and Arctic Programme and how Scotland, Ireland and Northern Ireland can contribute and benefit from an increased focus on Arctic topics in the Programme.

The second series of documents ‘proposal for a cross-Arctic regional collaboration mechanism (ARC-NET)’, ‘ and ‘Arctic Connections – Mapping Regional Cooperation in the Arctic’ were drafted in the context of a major international conference (Arctic Connections) held in Glasgow on 10-11 June 2014. The Conference was hosted by the EPRC on behalf of the Scottish Government. The goal of the conference was to explore more collaborative approaches in relation to regional cooperation in the Arctic. The conference provided participants the opportunity to engage with, and inform discussions on, the latest thinking in relation to regional cooperation in the context of Arctic development opportunities and challenges. Key themes that were addressed included:

- new strategic and policy approaches to regional-level Arctic cooperation;
- the role of the ‘near’ Arctic in territorial cooperation activities with Arctic partners; and
- identifying a more collaborative approach to Arctic territorial cooperation.

The remainder of this briefing note expands on each of the key points from the above summary.

1. REGIONAL AND LOCAL DIMENSIONS OF CHANGES IN THE ARCTIC

Due to the rapid climatic and related economic and societal changes in the Arctic political interest in the region has grown over the past decade. All Arctic states and some near-Arctic states as well as supranational bodies such as the EU have developed Arctic strategies or policies. Such documents tend to provide a high level perspective and consider the importance of the developments in the region from a national dimension. However, the regional and local dimensions play an important role in developing opportunities in the Arctic region that are environmentally and culturally sustainable.

Key challenges for Arctic regional cooperation relate to the physical and human geographies of the region. The distances, sparse populations, peripherality of communities, inaccessibility, and hostile climatic conditions are all significant barriers to cooperation. The combination of these characteristics makes local communities vulnerable to changes that the region is undergoing. However, from a regional cooperation perspective these characteristics can also facilitate cooperation, providing common cause and shared development concerns which can provide impetus for lesson learning and knowledge exchange.

A number of themes are particularly relevant in the context of Arctic regional cooperation. These include innovation, resource based economy, energy (hydrocarbon and renewables), transport and accessibility, and the themes of community development and environmental...
protection that cut across development activities in the region. Such themes feature prominently in the strategies and policies and are also a priority for the many regional cooperation programmes in the region.

2. INSTITUTIONAL FRAMEWORKS

The Arctic is covered by a dense web of collaboration, cooperation and coordination mechanisms and networks. Transnational and cross-border regional cooperation in the Arctic has a long history, and is in the case of the Euro-Arctic often embedded in wider Nordic cooperation structures. Key institutions and frameworks include: Arctic Council, Nordic Council of Ministers, Barents Euro-Arctic Council (BEAC) and Northern Dimension framework. Within the EU context the European Territorial Cooperation\textsuperscript{22} (ETC) programmes which are cross-border, transnational and interregional cooperation programmes across Europe and include a number of programmes that are in or adjacent to the Arctic region, e.g. Northern Periphery and Arctic Programme (NPA) North Sea Region Programme (NSRP), Baltic Sea Region Programme (BSRP), Nord and Botnia Atlantica play an important role. Finally, European Neighbourhood Instrument\textsuperscript{23} (ENI) cooperation programmes between EU member-states and their non-EU neighbour states in the Arctic - these include Kolarctic, Karelia and South East Russia programme - are also key stakeholders particularly in terms of the Russian dimension. Thus, there are a significant number of, at times, overlapping institutions and programmes that are concerned with Arctic development challenges and engage in territorial cooperation activities. However, due to sparse populations, a major challenge for cooperation partnerships is the lack of a critical mass of stakeholders. Regionally and locally-based stakeholders often have limited capacity for practical reasons (remoteness, limited funding, etc.) which can constrain their ability to influence key institutions. In order to improve the impact, efficiency, and effectiveness of cooperation programmes and other organisations that are concerned with Arctic development issues, and to achieve synergies between them, a collaborative approach is required.

3. SHARED CHALLENGES

Considering the scale of changes in the Arctic, interest in Arctic developments is not confined to the region itself. Many of the challenges the Arctic region faces have a global impact. In this context and from a regional cooperation perspective, near-Arctic regions can make a valuable contribution. Near-Arctic partners can add value to Arctic partnerships, helping to overcome some of the issues in relation to critical mass. Arctic development concerns cannot be considered in isolation. Core Arctic countries and regions have a strong and immediate

\textsuperscript{22} EU cohesion policy encourages regions and cities from different EU Member States to work together and learn from each other through joint programmes, projects and networks. In the 2007-13 programme period there were 53 Cross border programmes, 13 Transnational programmes and 1 Interregional programme with a combined budget of around €8.7 billion

\textsuperscript{23} ENI provides support to 16 partner countries to the East and South of the EU’s borders with the aim to promote areas such as democracy and human rights, the rule of law, good governance and sustainable development.
interest, but others can also contribute. The increase in the number of Arctic Council members with observer status is a means of facilitating this process. Although some of the features of Arctic regional development are unique to the region, many of the challenges it faces are shared with other peripheral regions. In the UK, the Highlands and Islands in particular share commonalities with the region in terms of remoteness, peripherality, inaccessibility, sparse population, etc.. From this perspective a process of knowledge exchange and lesson learning is mutually beneficial.

4. THE ROLE OF TERRITORIAL COOPERATION PROGRAMMES

The Highlands and Islands (and also other parts of Scotland and Northern Ireland) have well-established links with Arctic partners, particularly through the Northern Periphery and Arctic (NPA) Programme an ETC programme that covers the northern regions of Europe and includes: Norway, Sweden, Finland, Iceland, Greenland, Faroes Islands, Northern Ireland and the Republic of Ireland.

Within the NPA programme the role of near-Arctic partners is valued by Arctic partners as they bring a lot of expertise on territorial cooperation projects in general and help to build practical, purposeful links with partners outside the region. Research found that links with UK partners were regarded as particularly beneficial for Arctic partners, as there is considerable experience in relation to territorial cooperation and relatively few language barriers.

The UK's involvement in territorial cooperation programmes potentially goes beyond the programmes in which it is a direct partner. Many programmes make provisions for the inclusion of 'external' partners. In order to formulate comprehensive project proposals partnerships in the region may rely on knowledge from stakeholders outside the region. Including partners from outside the Arctic region is considered positively by beneficiaries in the region as they can learn from them.

5. THE SCOPE FOR INTERNATIONAL COLLABORATION ON TERRITORIAL COOPERATION

The cooperation efforts in the region are well-established in terms of the challenges they aim to address, the governance structures in place, and the number and types of actors involved. However, in order to achieve synergies and maximise the impact of territorial development activities, information sharing and knowledge exchange across these institutions and frameworks should be encouraged.

The Scottish Government in collaboration with the Norwegian Government, and other UK and international partners has taken the initiative to attempt to improve information flows, knowledge-sharing and capacity development on regional and local development in the Arctic and near-Arctic among programmes and institutions.

In March 2013, the Norwegian Government organised a seminar in Bodø to explore the prospects for greater collaboration between territorial cooperation programmes in the Arctic and near-Arctic.24 This event was followed up with two further events in Norway House in

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24 Discussions mainly considered the Euro-Arctic region (although there are also clear links to Canada).
Brussels (September 2013 and April 2014) organised by the Norwegian and Scottish Governments. In June 2014 a major international conference ‘Arctic Connections’ was hosted by EPRC in Glasgow on behalf of the Scottish government and further examined the prospect of greater collaboration. During these events the potential for the establishment of a mechanism, which could facilitate increased collaboration between regional actors in the Arctic and near-Arctic was discussed.

Discussions in the plenary and working group sessions of the Glasgow Conference provided a number of strategic objectives for a collaborative mechanism. First, the concept of utility of territorial cooperation for local communities was a key consideration. A collaborative mechanism should aim to enhance the relevance of territorial cooperation for individuals and communities in the Arctic and near-Arctic (e.g. ownership, engagement, capacity). In other words, it should ensure a bottom-up perspective. Second, a collaborative mechanism should aim at supporting the efficiency of programme and project delivery. It has to improve the management and delivery of territorial cooperation intervention (e.g. coherence, integration, targeting of activities/support; learning and adaptation). Third, the effectiveness of project and programme results should be a key concern. A mechanism has to increase the impact and added-value of projects and programmes (what works, what doesn’t). Particularly, in times of budget constraints at the national level and demands of result-orientation from EU institutions effectiveness has become an increasingly important consideration for territorial cooperation programmes. The mechanism could deliver a range of activities at different stages of the programme cycle - programming, project generation, project appraisal and selection, project follow-up and support, and monitoring and evaluation. The collaborative mechanism would focus on capacity building activities, knowledge and data sharing to increase the utility, effectiveness and efficiency of territorial cooperation programmes and wider policy decisions.

September 2014
Lord Soley: Good morning gentlemen. I am very pleased to welcome you to this Select Committee on the Arctic. I start by reminding you that we are webcast live—you will all be aware of that—and that you have before you a declaration of the interests of all the members. I say a particular thank you to Tom Paterson, who I think has flown in from Canada especially for this hearing, for which we are very grateful. We are also grateful to our other two witnesses, who have very impressive CVs on this. I trust you will all be able to help us on our inquiry.
Lord Tugendhat: Before you begin, interests were mentioned, and I should add that I am a shareholder in Rio Tinto.

Lord Soley: I think that ought to be recorded. Thank you very much.

How realistic, in your view, is the opening up of the Arctic to shipping? I would like all your views on this. We have heard various assessments of how much shipping through the Arctic and from the Arctic to nearby states is going to increase. I would like to get some idea of the difference between bulk carriers and in-and-out-of-the-Arctic carriers, which seem to have a different assessment. Who would like to start on the issue of how realistic you see the assessments, and your assessment, of the increase in sea traffic through the Arctic?

Rob Hindley: Primarily there are two different transport processes at work here. One is transit shipping using the Arctic as a transit route. The second concerns what we call destinational shipping, which is either into the Arctic or more commonly transporting primarily natural resources out of the Arctic. To touch first on how realistic a significant increase in Arctic shipping is, I would say that it is probably not. Primarily this is because, despite the recent changes in the Arctic ice extent, there is still a limited open-water season for ships to operate in. Beyond that limited season, ships operating require ice-class or ice strengthening, which is an added economic cost. Associated with that is the variability of the ice. You cannot predict year on year when the passage is going to be open, and from a shipping perspective, which I am sure my colleagues will highlight, that variability or unpredictability is not conducive to shipping.

There is likely to be an increase in destinational shipping associated primarily with natural resource export projects. The amount of traffic associated with that increase is primarily
focused on the economics: whether there is an economic reason or a valid economic model for exporting natural resources out of the Arctic.

Q132 Lord Soley: You have seen the very varied estimates of how much the ice will retreat. Do any stand out in your mind as being the most accurate, or do you have to have a bit of a wait and see about this?

Tom Paterson: That is a very good question, Lord Chairman. The variability of the ice is not predictable, but through hindcasting we can see what it was 10, 20, 30 years ago. There is a pattern. Although the Arctic ice has definitely reduced significantly, this year there was no clear route through the North West Passage. Last year, there were some open-water routes for just a few days, and the year before there was a completely open route. This year, the ice was not conducive to through transit. Last week, we sent the first ever unescorted vessel through the North West Passage. It is interesting that it was only the second commercial vessel that had transited the North West Passage for more than 100 years. Fifteen years ago, it was asked whether the North West Passage was going to become the next Suez Canal or Panama Canal. It will not. As my colleague said, the Arctic is a destination to load or discharge, but with the ice being so unpredictable—it moves south or north depending on the winds—you cannot possibly plan your voyage. The most important thing to understand is that the newspaper clips we see of Chinese vessels going from China to New York via the North West Passage or through the northern sea route to Europe are not going to happen. I would not use the word “probably”; it is not going to happen because it does not make money. The Arctic is a destination to go to load—to come from the east and go to the west or to come from the west and go to the east—but the capital cost of the ships is two to three
times higher, and for nine months of the year when you are not working in the Arctic you are going to lose money in the open water, so the ice is the problem.

**Lord Soley:** That is a very confident statement: “It is not going to happen”.

**Tom Paterson:** The question was whether it is going to increase significantly, and the answer is no. There will be increased traffic, but it is something like 0.02% of world trade. It is such a small number.

**Lord Soley:** Lord Fairfax, you have a lot of experience of the Russian trade, which is significant, to put it mildly.

**Lord Fairfax of Cameron:** Yes. I first went to Russia in 1982, when I was still a Member of this place, and I have gone a lot. Indeed, I have done an Arctic voyage. I mention that because I have personal experience. That was on one of our Arctic shuttle tankers from Murmansk to an offshore platform called Varandey, which is 500 miles due east. I did it in 2010 on board one of our specialised Arctic icebreaking shuttle tankers. Having seen it, including a force 10 storm on the way home, I am able to appreciate a bit some of the challenges up there.

Before I comment on the question, would it be helpful if I said a couple of words—I will try to restrict them—about what Sovcomflot does?

**Lord Soley:** I looked it up because I was interested. If you could.

**Lord Fairfax of Cameron:** If it will help. I will try to keep it brief. On the northern sea route, which is alternatively known as the North East Passage, and in the Arctic, we are considered one of the major players, along with Fednav on the Canadian side. We have various involvements. First, apart from the northern sea-route transits, when we are going across from, say, Murmansk to China, we also have various projects in the Arctic. I mentioned one
called Varandey, which is basically an offshore platform. We have three specialised icebreaking—as opposed to ice-class—vessels. This means that they can break ice themselves without the need for an icebreaker. We have three Arctic shuttle tankers that service that platform. They go from Murmansk to Varandey, collect 70,000 tonnes of oil and come back. It is like a moving pipeline, in a way.

We also have a second one, which you might have seen recently, for the wrong reasons, called Prirazlomnaya. It is a huge Gazprom platform. I say “for the wrong reasons” only because it was targeted by Greenpeace. The platform is not Sovcomflot’s but Gazprom’s, and we have two Arctic shuttle tankers—both, I think, classed with LR.

Then, subject to current geopolitical events, there is a huge Yamal gas project, of which some of you may have heard. We might be involved in that in providing very specialised icebreaking, ice-class LNG carriers to service that. So those are three projects we are involved in. Then you have the northern sea route and a seismic mapping vessel that we are just starting to use in ice. Oil companies use this to map the sea floor, not to find the depth or anything but to chart it to try to find where the oil is. We are experimenting with new technology, which we may be able to use in ice. I mention this, although it is not strictly to do with the Arctic, but as far as ice trading is concerned, Sovcomflot is very heavily involved in two projects on Sakhalin Island, Sakhalin 1 and Sakhalin 2, one of which involves just oil and the other oil and gas. I mention that just to give you some idea of the extent to which we are players not just in the Arctic but in ice conditions.

Turning to your question, if I may, you have heard a perhaps rather realistic view already. As probably the No. 1 player, certainly on the Russian Arctic and ice side, all the way down to Sakhalin Island, it is in our interests to look at the northern sea route. You have heard that it
has changed recently because of climate change. There is obviously a big debate about the extent to which it is happening and there are all these predictions that the Arctic is going to be ice free in the summer, perhaps even as soon as 2020, as someone has said. I do not know whether that is realistic, but, because of what has happened already, we put our first tanker across the Arctic in 2010 and then a bigger one the following year, all with icebreaker assistance. This was all in the summer. This year, for example, we are slated to do nine transits. As you may be aware, the season is normally July to November, depending on particular ice conditions. Just superficially, I was having a chat while we were waiting outside—

Lord Soley: Can I ask you to be brief, as otherwise we will be squeezed for time?

Lord Fairfax of Cameron: I am so sorry. I was just going to say that superficially, of course, the attractions are considerable. The distance saving is massive. When we did our first shipment, we might have saved as much as 50% in mileage, and therefore you have saved fuel and emissions. I will just mention that you also avoid the piracy problem in the Gulf of Aden and the Indian Ocean as well—I say that as an aside. Against that, there are considerable challenges, as we will hear later. You have to invest heavily in the hardware in the specialised ships, as we do, and in the software: namely, the masters and crew. The insurance is also challenging, and so on and so forth. We will probably discuss that more later. So, yes, there are distance savings and so on, but there are also massive challenges.

Lord Soley: Thank you. First I will ask Lord Hannay and then Lord Tugendhat to comment.

Q133 Lord Hannay of Chiswick: I would like to ask you to look at an aspect of this question which none of the three of you has mentioned so far, which is the possibility that the advantages of the northern transit route—I am talking here only about transit, not about
destination—could, of course, be drastically affected by developments elsewhere in the world, such as the Egyptian decision recently to double the size of the Suez Canal and the fact that they have, I think, successfully raised the initial funds necessary to start building that. That, presumably, would affect the sort of figures that we have been given on the advantages of using the northern channel route over the alternatives, although not as regards the distance, of course, and you could have negative consequences if there was a huge flare-up of piracy. Listening to you, I get the impression that things like the Suez Canal development reinforce your view that the northern transit route is not going to become very attractive any time soon.

**Tom Paterson:** I would say so, absolutely. For example, going from New York City to Shanghai, the saving, if you reduce your speed, which you have to do through ice, is about three days going through the Panama Canal. If you look at the North West Passage versus Panama or Suez, you would go through the Panama Canal. Why would you risk damaging the ship to save three days? That is unlikely. Going from Rotterdam to Shanghai through the Suez Canal means travelling for 33 days as opposed to 36 days, so why would you take the risk to save three days? Yes, you save some fuel but you have to go slower. Container ships today are in real-time inventory. Given the larger Suez Canal and the larger Panama Canal, quite frankly I do not see why the shipowner would take the risk of going north; it is just too high a risk. Unless you have ice class on your vessel, you are not allowed to proceed. That is the first thing. In order to have ice class, you have to pay a premium for the vessel. A standard Panamax vessel, which carries about 75,000 tonnes of bulk cargo, will be 10% to 30% to 40% more for ice class. For polar class, it is three times the cost, so the capital cost does not work. Therefore, the northern routes will not be competitive on the transit side.
Lord Soley: Do Lord Fairfax and Mr Hindley agree with that broadly, or would you like to add any important points?

Rob Hindley: I completely agree with the assessment that has been made, but I would just like to add to that. You mention the potential new Suez developments and the new Panama locks that are coming on stream soon. That only reinforces the possibilities for using more southern routes, because you now have the opportunity for deeper draughts with the new Panama Canal. As regards the difference in constraints on shipping size, if you continue to operate on a northern sea route in anything but the very open water season when there is access to a deeper draught route, you will be constrained. Of course, shipping is always based on economies of scale, and where you can use larger ships that will obviously affect the economics of the decision as well.

Lord Fairfax of Cameron: I would just add a comment on the type of ships you are talking about, because certainly in our case we are talking about oil and gas tankers. If you talk about container ships, for example, I think it is probably out of the question that it would ever be attractive for them to use the northern sea route. One of the things about container ships, as you probably know, is that they are like a bus service. You get these round the world container services and they just stop off at places, discharge containers and load other ones. Of course, you are not going to get that going across the top of Russia at the moment. Apart from all the other problems that we have heard about, such as draught, I certainly would certainly rule out container ships.

Lord Soley: We are going to come to types of shipping in a few moments, but first let us hear from Lord Tugendhat.
Q134  Lord Tugendhat: I remember, very much along the same lines as Lord Hannay, back in
the late 1960s, paying a visit to BP drilling operations in Alaska, and very interesting they
were, too. We were told that of course there was not a great deal of future for that sort of oil
operation because, as oil was available in so many other places where it was much cheaper
to extract, the Arctic would not have much of a future. Of course, what has happened in the
oil industry has been governed very much by what the economists call exogenous events:
people drill in very deep waters in very unfavourable circumstances because the political
conditions in areas where it would be much easier to drill have deteriorated and become
very risky. Therefore I suggest that the certainty with which you speak about what is going to
happen in the Arctic is questionable. Everything will depend on what happens politically in
other parts of the world, which will change the calculations to which you quite rightly draw
attention.
Secondly, one thing we have all learnt about climatology in the last few years is that
forecasts of what is actually going to happen and the speed with which things are going to
happen are very unpredictable. Some things have happened more quickly and some things
have happened more slowly, and even if there is a trend it is an imprecise science. It seems
to me that what one needs to think about here are the conditions that might arise that
would lead to these routes becoming more attractive, rather than to speak with certainty to
suggest that they will not.

Lord Soley: So, are you overegging the pudding with your certainty, or not?

Tom Paterson: That is a very good point. Can I just add something technical? People talk
about “ice free” and “open water”, but there is a significant difference. “Open water” means
that there is still about one-tenth of ice. What does that mean? It could be a bergy bit, which
is a small iceberg that has broken off, or a growler, which is a smaller piece about the same size as a Mini. If you hit a Mini—this growler—at 16 knots or 17 knots, you will sink the vessel pretty quickly.

**Lord Soley:** You mean a Mini car?

**Tom Paterson:** Yes, it is the size of a Mini car, and it has the same molecular structure, under the microscope, as titanium. So it wins over the steel. Unless your ship is really highly designed to cope with this, which costs a lot of money, the standard ship is not able to come in contact with this type of ice.

To refer to your point, of course we must have an open mind. Referring to the transit route specifically, we are saying that the transit route economically does not make sense except for maybe two, maybe three, months of the year. For the rest of the year that ship would be carrying a financial penalty, first because it has the heavier steel weight, secondly because it has a bigger propeller, and thirdly because it has a bigger engine. That is not efficient in the open water. As we said earlier outside, you would only run a race car on a race track; you would not run a truck on that race track. You must keep ice-class and icebreaking vessels close to the ice to be economical. So the transit route becomes economical, and of course ship owners are in the business to make money. That is why the transit routes are not happening.

I completely agree that destinational traffic is increasing. Next year, in Canada, the Baffinland Project will start producing, and we intend to ship about 2.5 million to 3 million tonnes of iron ore. So, yes, from a destinational point of view, the Arctic is increasing. In the northern sea route, the trip from Murmansk is a destination across to China. But again, going back to the transit routes, it does not make economic sense for the ship owner.
Lord Soley: Thank you. I am going to ask Lord Fairfax to come in on this, but I am going to ask both my colleagues and you to recognise that we have moved on a bit from the first question: we are covering a bit of question 2 and a bit of question 3. I will adjust it accordingly. Lord Fairfax, you are anxious to say something on this point.

Lord Fairfax of Cameron: Thank you, my Lord Chairman. All I was going to say is that obviously Sovcomflot are rather more believers, perhaps, than some of my colleagues on my left. I would agree that there is a massive distinction to be made, perhaps, between transit shipping and what we have called destination shipping. In our case, destination shipping, as you heard from my little introduction, includes some of these very important energy projects up in the Arctic. There is an estimate that maybe as much as 25% of the world’s undiscovered gas reserves may be in the Arctic. That is the game in which Sovcomflot is involved—about getting that gas to market from extremely challenging environments. So I would make that point. We are investing very heavily in that. I have spoken about the Varandey Project and Prirazlomnaya. Yamal may, subject to current events, come on later, and others too. There is that big distinction between transit and Arctic energy projects, I would suggest.

Lord Soley: I am beginning to be clear about that myself from some of the other questions we have asked. Can I bring in Viscount Hanworth? I think he wanted to deal with question 2 and with this. Then I will bring in Lord Hunt. In a way, we are also overlapping with question 3, which I think you were going to lead on.

Q135 Viscount Hanworth: Much of what we started with has been answered, but there are still some issues. Mr Paterson has told us about the difficulties of Arctic shipping in the current circumstances, and his account has been affirmed by Lord Fairfax. We should also
like to speculate about the future. Might I therefore ask our panel to further categorise the types of shipping operations and the types of cargo that might be attracted by the opening of the Arctic sea routes both east and west. I now understand that we should be talking primarily about destination, so it is a question of origin and destination and the types of cargo. Of course the answer must depend on presuppositions regarding the extent of the polar ice summer. I fully understand that. Beyond that, if you are prepared to speculate, how competitive might the Arctic sea routes become with other available sea routes, albeit that I now understand that we have heard conclusively that they are not going to be very competitive for transit shipping?

*Tom Paterson:* Our company, Fednav, owns the largest fleet of ice-class tonnage and icebreaking tonnage in the world. We are investing heavily in the future, because, as you rightly point out, there are tremendous projects coming, both in the oil and gas sector and in the bulk sector. It is going to increase substantially. We have been operating in the Arctic for 50 years, and at the moment we ship about 2.3 million tonnes a year from the Arctic. That is mainly base metal concentrates: lead, zinc, nickel, copper. Inbound we take fuel, mainly to run the mines; there is still no alternative energy. We also need a lot of fuel for the gold mines. Of course, the gold comes out in an airplane, as the diamonds from diamond mines do. All these mines are expanding because the ice is receding and allowing them to operate through a longer summer season. Iron ore is the next big increase, certainly in the Canadian Arctic. Next year we will start operating the ArcelorMittal deposit; it owns 50%. That is starting at 3 million tonnes next year—three million tonnes in 75 days, summer shipping only. In order to increase that tonnage, there must be massive investment. That investment comes in the form of a 90,000 tonne polar class 4 self-unloading vessel that will do trans-
shipping off the coast of Greenland into market vessels, non-ice class. To be competitive, again the icebreaking vessel needs to stay close to the ice. Then it will increase to two and three ships, and their intention is to go to 18 million tonnes a year by 2022 and to operate all year round. At the moment we are operating all year round unescorted, with icebreakers, in the Canadian Arctic, with three vessels. We go on our own and we load nickel, because of the very high value of the product, not to keep it trapped in the Arctic.

**Viscount Hanworth:** That is a very cogent answer. May I ask something that is perhaps not directly related: the question of the extent to which the submarine topography dictates the size of the ships, their draught? Would the problems of shallowness, if you adhere close to the coastline, affect this scenario?

**Tom Paterson:** In Canada, no, because there is very deep water pretty close. Certainly Greenland is very fjord-like. Unfortunately, it is very unforgiving because it is not sandy beaches—it is very rocky—so it has to be done precisely. Navigational aids are a challenge, but today, with differential GPS it is pretty easy to have your ship accurate within a few metres. Today’s technology allows a lot of things to happen. We also have very precise satellite imagery from space to show us where the ice is, and this year we are using drones for the first time to check the ice: we can get a bird’s eye view. With today’s technology we can go further.

**Viscount Hanworth:** The satellites would not help you with Mini-sized growlers, though, would they?

**Tom Paterson:** No they would not. I am afraid the only thing that helps you with that is to slow down.

**Viscount Hanworth:** Okay, you have gone west; what about east to the Russian coast?
*Tom Paterson:* My friend here is much more versed on the Russian Arctic. We are certainly no experts on that route.

*Lord Soley:* Do you have a brief answer to that, Lord Fairfax?

*Lord Fairfax of Cameron:* I agree that draught is a big challenge. I know from one of the first two transits we did with laden tankers that draught is an issue, not least because some of the charts still require updating and so on. They may be unreliable. We obviously took enormous care when we did our first two laden voyages. The first was with an Aframax tanker, which is about 100,000 tonnes, the second with a Suezmax tanker, which is even bigger at 170,000 tonnes. It is vital that we get the draught right. The fact is that draught is definitely a challenge.

*Lord Soley:* We have heard problems about mapping the ocean and the ocean floor there. We understand that.

Q136  *Lord Hunt of Chesterton:* Lord Fairfax commented that if you took one of these long voyages from lower-latitude places to lower-latitude places that you might have 50% fewer miles and therefore significantly less emissions. One of the important issues before us is the exogenous issue that Lord Tugendhat said: the question of carbon emissions. As you know, shipping currently produces about 15% of global emissions of greenhouse gases. There is every expectation that that might rise, even to 20%. One of the suggestions to reduce the big emissions by shipping is for ships to go slower. If ships went at half the speed the carbon emissions of shipping would be not halved, but would be lower. All these things are good reasons why ships going slower over a shorter distance may be a very significant contribution to the global climate problem. Would you like to comment on that? Suppose following a world meeting in Paris or something, which is perhaps a bit optimistic, they introduce a
carbon tax; that would impact shipping. I wonder whether the shipping world is getting its mind round the kinds of pressures that will be put on it. It seems to me that it should be thinking in a much more positive way than Mr Paterson suggested—maybe he can comment.

**Tom Paterson:** I would love to comment, if I may. First, the emissions of our standard fleet have reduced by about 35% in the last seven or eight years with new vessels. Coming back to the ice-class vessels, they require much bigger engines. It is a bit of a Catch-22 situation. We can do the transit route with standard vessels that are very fuel efficient in only a very limited period of time: the very short summer. If you build the ice-class vessels so that you can do the shorter route, then that ship will consume more fuel for the other 10 months of the year while it is operating in open water.

The carbon footprint is extremely important. That is why we went north on the last voyage we did from the Deception Bay mine to China: it was 40% less emissions for one voyage alone. We have to remember that the ice-class vessels have much bigger engines. Yes, the footprint is more for the ice-class vessels, but remember that they are taking large quantities of either fuel or bulk materials. On a per-tonne basis things are improving dramatically. Mr Hindley from Lloyd’s will be able to comment further, because today we are moving to tier-3 engines and our emissions have come down significantly. For example, today, our bulk carriers consume between 35% and 40% less fuel than they did only 10 years ago from a new vessel.

**Lord Soley:** That is good news.

**Rob Hindley:** I would like to address efficiency, along the lines of Mr Paterson’s explanation. Principally, in recent years we have seen a reduction in emissions from ships. Primarily, one of the drivers, as well as improvements in engines, has been energy savings from hull-form
design and from the shape of the ship. Certainly for ships operating on open waters we have seen quite a dramatic decrease in the energy required to move those ships. Those have been primarily hull-form shape and engine tuning-related technology advances. The challenge from an ice-class perspective is that those are almost completely the opposite to what you need for an ice-class ship. An ice-class ship needs a full bow shape to break the ice, whereas you need a fine bow shape to be efficient in open water. I believe Mr Paterson has discussed this already, but unless you use a ship that is designed to operate in ice all year round, you will actually be expending a lot of additional energy moving that ship in open water. That is a cost that makes those types of ships uncompetitive with the ships we are seeing today, which are designed and optimised for open water navigation. You might actually increase emissions because you have pushed people towards using ships on a shorter transit but you have an ice-class ship that is producing more emissions.

**Lord Soley:** I call Lord Fairfax, and then I want to move on to safety and construction.

**Lord Fairfax of Cameron:** I do not think I have very much to add here, save to say that Sovcomflot takes emissions extremely seriously. We consider ourselves one of the most technologically advanced shipping companies in the world. We work with a lot of research institutes, in particular for our arctic and ice trading. What has been said about ice-class vessels is right to some extent, but having said that the transit times can be dramatically reduced, as you have heard. I am not quite so black and white as my colleagues are.

**Rob Hindley:** May I just come back on that point, because I think it is important? If you already have the ice-class tonnage and you can use it in other areas that have ice during the season when you are not transiting, there is then more of an economic argument for it and it
makes more sense. However, investing in a ship initially for that short season is the kind of point we are trying to address.

Lord Hunt of Chesterton: We really can rely on several months with really no ice, whether that is in 20 or 30 years. They had a very unscientific vote in the Royal Society meeting on climate change in September, which was most unusual: “Who thinks five years? Who thinks 10 years?”. When that happens, presumably you will be able to use normal ships through the summer months, is that right? If you use normal ships through the summer months they will be travelling shorter distances and therefore emit less carbon.

Tom Paterson: If that is the case, certainly the Russians and the Canadians would have to change the rules, because at the moment that is not permitted.

Lord Hunt of Chesterton: Twenty years is enough to change the rules, is it not?

Tom Paterson: I do not disagree. However, if I may, Lord Chairman, I will come back to the difference between open water and ice free. There is no route through the Canadian sector that is ice free, because that means you would have to go 60° degrees north up the coast of Greenland before you turn west into Lancaster Sound. That entire transit route from 60° north to 70°—10 degrees of latitude, which is 600 miles—goes through bergy waters that are calving off the coast of Greenland. Ironically, because of climate change more icebergs are calving off the glacier, which means that there are more icebergs, more bergy bits, more growlers and more Minis in the ocean to hit. It is not so much the lack of ice that is the key, it is the one piece that you hit. Of course, in the summertime the other phenomenon is fog. We have a lot of fog off the coast of Greenland, which means that ships have to slow down: if you slow down and still hit a growler or a bergy bit, the ship is in a lot of trouble.
Lord Soley: I think what you said about growlers is quite sobering. I had not realised that ice was as strong as you are saying. Perhaps I may move on and ask Lord Oxburgh to take us through the safety and construction issues.

Q137 Lord Oxburgh: Mr Hindley, can you tell us how these polar classes for ships—I think there are seven polar classes—are specified? Are they detailed construction constraints or what?

Rob Hindley: I will start with ice class in general in terms of construction standards. Historically, classification societies have developed construction standards for ships operating in ice. Those are primarily focused on strength aspects and are what we call ice classes. The polar classes that you refer to are the latest generation of those ice-class developments. They were developed by the International Association of Classification Societies and, if you like, are a collection of ice-class rules combined.

Lord Oxburgh: Are they specified in engineering terms?

Rob Hindley: Yes. Simply, they are rules that govern the strength and the amount of steel that you put on the ship to resist ice load.

Lord Soley: Is the UK a leader in the technology generally?

Rob Hindley: I would say that ice mechanics and ice engineering are international; it is a very specialist field. I would hesitate to say that the UK is a leader. The Russians and the Canadians have the bulk of historical experience, but it has been a combination of the classification societies, of which Lloyd’s Register, which is based in the UK, is one, that has contributed to these rules. Fundamentally, the foundation of that work is the Russian and Canadian experience of operating in ice.
**Lord Oxburgh:** Those are engineering standards, which is fine, but how is it then determined how these ships, which are built to different standards, can operate in the Arctic?

**Rob Hindley:** Two sets of national regulations are in existence for the Arctic that basically link shipping regulations with ice class. Both Canadian and Russian regulations refer to ice classes and link limitations for operation to ice classes. The regulations themselves are not the ice classes.

**Lord Oxburgh:** But given that the ice conditions, the sea conditions, change continuously, how is it decided whether a particular vessel can transit through a particular sea?

**Rob Hindley:** At the moment, regulations for the northern sea route link the ice classes with the type of season. Basically, the season is declared to be easy, average or harsh. The assessment of those ice conditions as a kind of go/no-go will depend on what ice class you have.

**Lord Oxburgh:** Who declares those seasons?

**Rob Hindley:** The northern sea route administration.

**Lord Oxburgh:** So it could be the Russians or the Canadians for their particular areas.

**Rob Hindley:** The Russian side I have explained. From the Canadian perspective—I am sure Mr Paterson will correct me if I slip up—there are two basic regulatory parts. The first is that the entrance into parts of the Canadian Arctic is regulated based on date, which is based on a hindcast of what ice conditions have historically been in those areas.

There is also a system in place that allows, in a regulatory framework, assessment of the ice conditions in front of the ship. Those are linked to the ship’s ice class. The decision to go or not to go is made on the bridge of the ship. The framework of that decision is part of the regulations.
Lord Oxburgh: Are these real-time assessments available throughout?

Rob Hindley: For the Canadian Arctic, the answer is yes. For the Russian Arctic, it is very much a case of “you can” or “you cannot” go.

Lord Soley: Can I move on to Lord Addington, because it is perhaps a good time to move on to critical infrastructure and safety factors.

Q138 Lord Addington: We have heard about the trying conditions for which you will need specialist ships for the foreseeable future. I think we are all agreed on that. What infrastructure do you need to support these ships to enable them to operate in Arctic waters? I am also thinking about the regional difference and the structure behind the safety of the people on the ship and the safety of the environment, which might include policing as well. Also, what different structures are in place in, for instance, the north-west, the north-east and going through? Which one is the most desirable that we should move towards to support?

Lord Soley: We are getting tight on time, and your time is very valuable to us, so we want to make the most of it. I would be grateful if you could be as brief as you can. We do recognise that it is a very important area.

Tom Paterson: There is very little infrastructure in the Canadian sector. The infrastructure tends to be on the vessel. They are somewhat overdesigned to be very, very safe. They are double-hull ships and all the fuel is away from the side. Therefore, you are your own icebreaker, your own coastguard and your own survivor.

In the Russian sector there are 2 million people between east and west. Therefore, the Russian sector is much more developed in the sense that there are a lot of ships supplying the communities as well as the transit ships. In the Canadian sector, there is only a very small
community of about 40,000 people, so there is really no infrastructure. These communities are supplied in a brief two-month season by ships from the south. For the other 10 months of the year, no ships go to these communities. No ships are operating in what we call the North West Passage for 10 months of the year. There is no infrastructure and, quite frankly, not a lot of icebreakers in Canada. The sad reality is that there is one icebreaker in Canada that can follow the commercial ships. The infrastructure is very weak.

**Lord Fairfax of Cameron:** This is a huge topic, but I will try to deal with it in about 90 seconds.

**Lord Soley:** You can always send in more written evidence after this if you feel that we have missed things out. You are right: we have been worried about the search and rescue aspect, and the infrastructure, for some time.

**Lord Fairfax of Cameron:** I have done enough preparation for about 10 hours.

**Lord Soley:** You will have to compress that!

**Lord Fairfax of Cameron:** Along the northern sea route, Russia is the littoral state and therefore has primary search and rescue responsibility, and de facto has such responsibility. That is my first point. It has marine rescue co-ordination centres along the northern sea route. Currently, if you exclude Murmansk, there are four at Dickson, Tixie, Pevek and Provideniya, which is just by the Bering Strait. I think I have read that it has ambitions to get to as many as 10 co-ordination centres covering these different sectors and seas. Although it is called the Arctic Sea, it has different names along the way.

In terms of search and rescue, recognising the paucity of facilities at the moment, even though they may increase in the future, when we took our first big tankers across they were escorted by very powerful icebreakers, which had very specialised equipment on board. One
of the approaches is that if you recognise that along this vast area you do not have land-based search and rescue facilities, perhaps they should be ship-based and on some of the icebreakers themselves. I am just trying to remember the statistic. Russia has something like 40 icebreakers. It is building more, particularly very, very big ones, which might be able to provide mobile search and rescue.

Q139 Lord Addington: Going on from what you said about the potential environmental and pollution disasters out there, it is incredibly difficult to get anything there to deal with a big disaster. There would be very little capacity for taking immediate action in any part of this, even including some comparatively minor things, such as ship discharges of waste. There is virtually no way of getting anything down to deal with it.

Tom Paterson: In the summertime, there are coastguard ships there. In the wintertime, there are not. At the moment, very few ships operate in the winter. In the summertime, the Canadian coastguard is there, as are the Russians. As far as discharges are concerned, there is zero discharge. We have a zero-discharge policy. Yes, accidents happen. In the summertime, there are ships available to assist, but if transits start to occur in the wintertime, the infrastructure is not there.

Lord Soley: Fine. Can we move on to Baroness Symons now?

Q140 Baroness Symons of Vernham Dean: I think we have dealt quite a lot with the environmental factors, so I would like to turn to some of the other factors that constrain shipping in the Arctic. You are all businessmen, and as such in your various capacities you have to keep an eye on the business potential of what you are doing. What constraints do you see in the bureaucracy around shipping in the Arctic—the insurance, the licensing, the permit requirements? Do you regard those as unnecessarily bureaucratic? Are they inhibiting
factors? Moving on a little from that, we touched briefly on the geopolitics of the region and also of other regions producing valuable minerals, oil and gas. How might geopolitics limit what you are able to do in the Arctic? There are two points—the bureaucracy point, and the changes in the market because of geopolitics elsewhere and within the region.

Lord Soley: Can I ask Mr Hindley to start on that, because a very important point which Baroness Symons has touched on is insurance? Presumably if insurance costs are too high or it is not there, a ship does not go, full stop.

Rob Hindley: I am afraid that I am going to pass that question to my right because we do not deal directly with insurance. I will talk about the technical issues. I believe Lord Fairfax can probably help you in this regard.

Lord Fairfax of Cameron: If I can, because I have an insurance background. Insurance is critical. Without getting too technical, there are two types. One is called “hull and machinery”, which is the insurance of the object itself, the piece of metal that floats and has a value, and the other is P&I, which is protection and indemnity, which is liability insurance for all the things a ship can do, including causing oil pollution or being susceptible to wreck removal. You might have seen from the “Costa Concordia” how incredibly expensive that can be. Insurance is incredibly important. That is the first point. It is a barrier to certain things. RCO has a favourite expression about the Arctic. He refers to “Arctic tourists”. He does not necessarily mean people on a cruise ship going up to Greenland. He is actually referring to shipping companies which might not be suited to going up to the Arctic. We like to think of ourselves as being so suited. Insurance is a barrier because if you are one of these Arctic tourists, it may be that your ship, your crew or whatever are simply completely unsuited to Arctic navigation, and your underwriters, your insurers, will assess your risk in a certain way
which may make it prohibitive for you to go there at all, or they may not even give permission. Frankly, you need hull and machinery and P&I insurance, so if your insurers are not going to give you permission, you simply will not be able to go there anyway. I could speak for much longer about that. I do not want to advertise Sovcomflot, but because we have invested so much in this Arctic and ice-trading thing, we do not have any such problems. Indeed, I can say that our underwriters do not charge us any additional premiums because our vessels and our crew, in particular, are considered suitable.

**Baroness Symons of Vernham Dean:** Are the costs rising? You must have an idea about the sort of costs for the different sorts of vessels.

**Lord Fairfax of Cameron:** Which costs?

**Baroness Symons of Vernham Dean:** For both types of insurance; particularly, I suppose, for protection and indemnity.

**Lord Fairfax of Cameron:** In general, the hull and machinery market seems to be in a permanent state of softness—if you really want to know—which is very good for ship owners. There seems to be too much insurance capacity and therefore the hull and machinery market is extremely soft. P&I costs are rising because of things such as the “Costa Concordia”, which has nothing to do with the Arctic. You can get massive claims which rebound on the sector.

**Lord Soley:** Thank you. We are getting very tight on time now. I am going to ask Lord Hannay to ask a very brief but important question on the Polar Code, and then I fear we are going to have to leave the session and I am going to ask for written evidence on what would have been Lord Tugendhat’s question.
Q141 Lord Hannay of Chiswick: You mentioned the cost of the “Costa Concordia”. If there were to be—and there has not yet been, thank heavens—a really bad disaster somewhere in the Arctic which involved huge costs, like the cost of the “Costa Concordia”, would it affect the whole structure of the insurance of polar transit? I will go on because we are short of time and the Chairman is anxious to go on. When do you expect the IMO’s Polar Code to become operational? What difference do you expect it to make to Arctic shipping and to the prospects for the future? Who is going to enforce the Polar Code, if it is properly constituted as an international legal obligation?

Rob Hindley: I will add just one sentence on the other factors. In terms of costs, fundamentally, when we are talking about destination shipping, we are talking about economics. If you can recover that premium for exporting from the Arctic, then technically we can export from the Arctic. When talking about increased insurance costs, if you can recover them in your economic model, then it is a viable prospect.

I sit on the Polar Code working group. I anticipate that we will be seeing the Polar Code on 1 January 2017. I think we will have a completed draft by the end of the year. Certainly, the text should be relatively complete. In terms of the difference I expect it to make, I am pleased that I am surrounded by probably the two best practitioners from the Canadian Arctic and the Russian Arctic respectively, because there is not going to be a significant amount of change for shipping operating there at the moment, because the Polar Code builds on the experience of operators who are there at the moment and are doing the right thing. The Polar Code will raise the baseline and draw attention to Arctic tourists, which Lord Fairfax alluded to, in terms of ensuring that there is a minimum standard which will
encourage ship owners to think twice before entering the Arctic areas to identify the issues that are required.

In terms of enforcement, the Polar Code, as you are probably aware, is basically set up within the IMO as amendments to SOLAS and MARPOL, which are statutory regulations for shipping internationally. As they are amendments, they will come into force once they are agreed, so there no question of ratification or of waiting until a certain percentage of the world fleet signs up. They will come into force once agreed. As they are amendments to SOLAS and MARPOL, they will be enforced in the same way, which is through a survey and certification regime which is how international shipping is regulated anyway. The enforcement will be done by flag states where the ships are registered or on their behalf by recognised organisations, such as classification societies.

**Lord Soley:** If our two other witnesses have anything to add or wish to embellish any other areas, please do it in writing to us, and in response to Lord Tugendhat’s question, which he has not had the opportunity to ask, about benefits to the UK. I would like to clarify something Mr Paterson said right at the beginning. You referred to the expansion of shipping in the Arctic as a non-starter. Were you referring to the North West Passage or to the whole of the Arctic?

**Tom Paterson:** I was referring to transit from southerly latitudes north and back to southerly latitudes, either through the northern sea route or the North West Passage. Economically, it does not fit.

**Lord Soley:** That is all I needed to know. I want to thank all three of you. You have a great deal of knowledge and I am afraid we have only skimmed the surface of it. It was very important. I know you have some written evidence and that from Lloyd’s Register is a very
impressive read. If you have more to add, please send it in writing. You will see a transcript of these notes, so you will know any other areas you want to build upon. It has been very helpful and important. Thank you very much indeed.
TUESDAY 15 JULY 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Moynihan
Lord Oxburgh
Lord Soley
Baroness Symons of Vernham Dean
Lord Tugendhat

Examination of Witnesses

Professor Danny Feltham, University of Reading, Professor Andy Shepherd, University of Leeds, and Professor Peter Wadhams, University of Cambridge

Q142 The Chairman: Good morning. May I welcome you to the Committee? You know the system from having observed it. Perhaps I could ask you first to introduce yourselves briefly for the broadcast. Then we will start to go through the group of questions. Perhaps, Professor Shepherd, you can start.

Professor Andy Shepherd: I am Andy Shepherd. I am the director of the Centre for Polar Observation and Modelling, which is based at the University of Leeds and is funded by the Natural Environment Research Council to provide national capability in developing satellite observations and models of the land and sea ice in the Arctic region. We also provide scientific leadership for the European Space Agency’s CryoSat mission. The evidence that I
will present today is based on the work of colleagues in CPOM, so I should acknowledge Andy Ridout, Julienne Stroeve and Rachel Tilling, as well as the contribution of my late colleagues Seymour Laxon and Katherine Giles.

Professor Peter Wadhams: I am Peter Wadhams. I am professor of ocean physics at the Department of Applied Mathematics and Theoretical Physics at Cambridge University. Before that I spent a lot of my career at the Scott Polar Research Institute, where I became director. I have been working in the Arctic continuously since 1970 and running a research group that studies sea ice and ocean processes, especially sea ice processes, in the Arctic Ocean.

Professor Danny Feltham: My name is Danny Feltham. I am professor of climate process physics at the University of Reading, and a member of the Centre for Polar Observation and Modelling. My area of expertise is in the mathematical modelling of sea ice physics, and I run a research group on that.

The Chairman: Good. This session is obviously about sea ice. Perhaps I could ask Lord Tugendhat to start us off.

Q143 Lord Tugendhat: The sea ice has been retreating rather more rapidly recently than it has in the past, and the total extent of it has diminished somewhat. Could you tell us what, in your view, the different and principal drivers of that change are? Are we seeing something that you believe is a long-run trend, or are we seeing something that might go into reverse quite quickly? Is it different in kind from what has been known in the past, or does it fit into a pattern?

Professor Peter Wadhams: It certainly differs in magnitude from anything that has been seen in the past. We have sea-ice extent records that are not that good going back a century or more. The retreat of sea ice that we are seeing now really started in about 1950, but it has become very much more rapid in recent years. The changes that are most extreme now are the change in the summer sea ice extent and the thickness of sea ice. We can measure the
thickness from submarines, and if you combine the thickness and the extent by multiplying the two you see that the volume of summer sea ice in the Arctic went down by 75% in the last 30 years from 17,000 kilometres in 1980 to 4,000 kilometres last year. That is a very serious change, and it is unprecedented, at least in the history of observations and given what we know from sediment cores from the history of the Arctic Ocean. It looks like it is heading in one direction only. It is affected partly by ocean currents: for instance, there is more warm water coming into the Arctic from the Atlantic and an increased flow from the Bering Strait. But the prime cause seems to be warmer air temperatures, especially air temperatures in the Arctic, which are rising at least twice as fast as at other latitudes. It is the warming of the atmosphere that has led to the thinning of the sea ice, and the thinning of the sea ice is the chief cause of the present collapse. The extent has held up fairly well; it has shrunk gradually. But as the ice thins dramatically—it is at least less than half as thick as it was 20 years ago—the thinning leads at a certain point to a collapse. The ice that grows in the winter melts in the summer. That is the point that we are approaching. It is not a reversible trend; it is a trend that is set to accelerate because of the collapse of the extent due to thinning.

**Professor Andy Shepherd:** I would add that the majority of changes in the sea ice volume or area that we have seen in the past 50 or 60 years have been attributable to greenhouse gas emissions and their effect on temperatures in the Arctic region. For example, the length of the solar melt season has increased by about five days per decade. That causes additional melting, which causes the retreat in the ice.

There are different ways of estimating the thickness, but it has certainly reduced as a function of time. We are getting better at estimating the thickness now that we have
improved technology that is able to look at the whole of the Arctic region, but it is certainly true that the extent has diminished quite rapidly. So, too, has the volume, and it is the volume that is important. If you have a glass of gin and tonic, you want to know how much ice you have all the way to the bottom. Then you will be able to say how cool it will be in an hour’s time. So the thickness of the ice is just as important as the area.

On top of that, we have had, and still have, short-term situations in the climate that drive quite dramatic changes in the amount of sea ice in the Arctic region. In 2007 and 2012 we had particular weather conditions that destroyed parts of the sea ice pack over and above the long-term climate change predictions. This is the same point that Chris Rapley made earlier on: to see the signal of climate change emerging from the variability that the weather causes requires long-term records, and that is why we use long-term satellite data sets—to look at this. As Peter said, the resilience of the ice is really important. The thinner it gets, the more susceptible to changes it is. If the ice pack that collapsed in 2007 or 2012 under those weather conditions had been as thick as it was in the 1980s, it would have survived those weather events.

Professor Danny Feltham: I concur that the evidence shows an unprecedentedly rapid decrease in sea ice extent and volume. I can also say that climate models are able to replicate the extent of the sea ice lost only if they are doing the old anthropogenics that you would do.

Lord Oxburgh: Could I just ask a quick follow-up question? I know that you do not have very long time-series data, but does it look as though this is a linear change over 30 years or an accelerating change? From what Professor Wadhams said, it sounded as though it was accelerating, but roughly what does the slope look like?
Professor Andy Shepherd: It depends on whether you are looking at the thickness or the volume—the area, I should say.

Lord Oxburgh: Let us stay with volume.

Professor Andy Shepherd: That is difficult, because Peter’s data are the longest record that we have, so we would want to compare like with like over long periods of measurement. It is not so easy—Peter should answer this—to compare today’s satellite measurements, which are comprehensive, rather like the ocean temperature measurements that we have for the planet, to the sparse measurements that we have from 30 or 40 years ago.

Professor Peter Wadhams: Yes. One can conclude that the volume is accelerating while the area loss has stayed fairly linear. The area loss was about 3% to 4% per decade, but it started to accelerate about 10 years ago to about 10% a decade. This is in summer but also averaged over the whole year; there is area loss at other times of the year as well. Whether you look at the whole year or the summer, where it is exaggerated, the area loss has been linear but has recently accelerated. The volume loss shows much more acceleration, because the thickness has been measured from submarines and more recently from satellites, which have been showing an increased rate of thinning—and of course multiplying the area by the thickness gives you an acceleration of the volume loss. This is the most serious thing that we are seeing: the fact that the volume in summer is now about 25% of what it was only 30 years ago.

Lord Oxburgh: The significance for this Committee is obviously the future navigability of the Arctic Ocean and on what timescale things are going to change from that point of view.

Professor Peter Wadhams: Projection is a difficult question. The last speakers talked about models and concluded that models on the whole are quite good in predicting temperature
changes, for instance, but that they had not been good in predicting sea-ice changes. In fact, there is a fairly large discrepancy between the model predictions and what has actually happened to the area and thickness of sea ice.

The Chairman: Thank you. We will look further at the future later in the questions.

Q144 Lord Soley: I think we all realise that it is difficult to study sea ice, but can each of you tell us what methods you use in your own work to study sea ice, whether the different methods that are used lead to different conclusions, and how reliable they are?

Professor Andy Shepherd: We use two different approaches. We use satellite and passive microwave imagery to map the extent of the sea ice over time. It is a really good tool because it can operate at night and through clouds. We have a long record of 30 or 40 years. It is a good climate record, and it does a really good job of discriminating between ice and the oceans. There are no differences in estimates of sea-ice decline and the area of the sea ice based on those data.

There are different approaches to measuring sea-ice thickness: you can measure it in situ on the sea ice itself; you can measure it from the ocean, as Peter does; you can measure the draft of the sea ice—the bit that is below the surface—and that is an accurate measurement; or you can measure the freeboard—the bit that pops up above the surface—with aircraft or satellite platforms. We do the latter: with satellite platforms. You find that the precision deteriorates as you move through that hierarchy of observations, but the spatial and temporal sampling dramatically increases with satellite observations, and it is really key to see the whole of the Arctic ice cap rather than just part of it.

To give a very simple example, the average thickness of sea ice in the Arctic is about 1.8 metres to 2 metres. If you miss the polar gap, which was missed by most of the previous
satellite missions, you will underestimate the thickness by about 20%, so you need to sample the whole of the Arctic to see it.

Professor Peter Wadhams: We use satellite data. In our field programmes, one big area has been using British submarines to measure ice thickness. We have been doing that since 1971, and the fact that the Ministry of Defence has made submarines available over these years for scientific research and allowed the publication of data from them is really important and very valuable for science.

The Chairman: Have other navies done similar things?

Professor Peter Wadhams: The US navy has, but the data gathering in the US navy submarines is done by the US Naval Research Laboratory, so the policies have varied over the years as to whether that data is to be freely published in science. A lot of it is, and that, together with the British data, has been the basis for the conclusion about the thinning and the reduction in volume. The US navy has been more sporadic in making the data available, although it has had a lot more submarines in the Arctic than the British have.

Recently, because of difficulties with the availability of submarines—we do not have many—we have been doing much more work with autonomous underwater vehicles: AUVs. They cannot give you the same coverage of the Arctic that a submarine can, but longer-range AUVs are becoming steadily more available, so in future work under the ice can be done by those.

One of the things for the future is very much the use of autonomous buoys—Sheldon Bacon touched on this. We can put buoys into the ice that will measure important parameters of the atmosphere, the ice and the ocean and will last a very long time because they are solar-driven and have solar power plus batteries. We have 30 buoys out at the moment in a joint
programme with the US, and they are measuring waves in the Arctic, which are possibly one of the causes of the rapid recent retreat in summer. These buoys are extremely valuable, and I think the future lies with them, because it is getting increasingly difficult to work in the Arctic because the ice is getting so thin, and it is getting more dangerous to work from it and establish camps on it because it is breaking up all the time. So you look for autonomous recording systems.

**Lord Soley:** Professor Feltham, do you have anything to add to that? Would you do anything different?

**Professor Danny Feltham:** I do not actually measure the sea ice. I use the measurements to test my models. The measurement techniques that are being discussed here, plus several others, including so-called EM birds and ice-tethered profilers, have been assessed by the Intergovernmental Panel on Climate Change. They find a strong consensus among the different measures of observation, so they are able to make strong statements about the decrease in sea ice volume and extent.

**Lord Soley:** Do the different methods that you are all using point to the same trends?

**Professor Danny Feltham:** Yes.

**Lord Soley:** You do not think that anything is out of kilter, one with another.

**Professor Andy Shepherd:** It requires care in interpreting these things. We had the same problem looking at the polar ice sheets of Antarctica and Greenland a couple of years ago. What matters is that you compare apples with apples and not apples with oranges. The different techniques measure very different things. If you stand on a sea ice floe and measure a column of ice, that is a very different observation from that made by a satellite, which might have a footprint of 10 kilometres on the ground. You have to take care in
Professor Daniel Feltham, Professor Andy Shepherd and Professor Peter Wadhams – evidence (QQ 29 – 36)

comparing things. It turns out that there are not that many coincidences with which we can make these intercomparisons. The best estimates are that the techniques agree to within about 10 centimetres, which is a small number compared to the thickness of a sea ice floe.

Lord Soley: Can I pick up the issue of submarines? I was pleased to hear your answer as I was going to ask you about submarines, and what you have said is encouraging. It has always occurred to me that, given the number of submarines that are wandering around under the ice for obvious reasons, if they were given the appropriate equipment they could give us much more information than they do already. Is that correct?

Professor Peter Wadhams: I think it is, although I do not think there are a lot more submarines wandering around under the ice—I think I have gone on most of the ones that go under the ice and it is only one at a time. Militarily, the under-ice environment is regarded as much less important than it was during the Cold War, so fewer submarines go up to the Arctic for military purposes. In the case of Britain, the last submarine was in 2007, when we had a fatal accident. I do not think that in itself dissuaded the MoD from sending more, but the availability of submarines has meant that there has not been a mission since then. The year 2007 was very important because there was a big retreat of sea ice in the summer, so it was a useful year, but this work is needed again.

Lord Soley: Can I ask one more question on this? Okay, there is limited information but very good co-operation with the Royal Navy, and there is some co-operation with and information from the United States. Is there any at all with Russia or not?

Professor Peter Wadhams: No, except very informally, because I know a lot of Russian scientists and in after-hour sessions at meetings they have talked about measuring ice thickness. One diagram in one Russian textbook appeared, probably by accident, showing ice
Professor Daniel Feltham, Professor Andy Shepherd and Professor Peter Wadhams – evidence (QQ 29 – 36)

thickness measured from Russian submarines. Basically, the Russians have a huge data set, which they have collected especially in the parts of the Arctic that British and American submarines do not go to—the Siberian side of the Arctic. That data set, at various times in the past, has been offered for sale to the West, when Russia was short of research funds. If we want to collaborate more with Russia, which I think is very important, we should put out feelers about that data set and say that we really need it.

Lord Soley: You would like us to explore that.

Professor Peter Wadhams: I think it would be worth exploring, even if it cost money, because the cost is very small compared to the value.

The Chairman: We need to move on.

Q145 Baroness Symons of Vernham Dean: You have explained the different ways of measuring how fast the ice melt is happening, but did anyone predict, back in the early 2000s, just how quickly this was going to happen? You particularly mentioned 2007, but did we have an idea from any of these various methodologies, or has this all happened in a way that has caused surprise? In some of the data that we have seen, it appears that nearly ice-free conditions will prevail by 2050. Is that your estimate as well?

Professor Peter Wadhams: My estimate is more like 2015 than 2050. I am speaking personally on the basis of research that I have done. I made predictions back in that period that the summer sea ice would disappear quite quickly, although we would still of course have sea ice in the winter. Even in the early 2000s, based on the trends that we were seeing then and the trends in thinning that we were measuring, it looked to me as though if you extrapolated that trend you would be getting essentially the disappearance of the summer sea ice by about 2020 or even earlier—it is still possible that it could disappear, or at least get
down to less than 1 million square kilometres, by next year or the year after. That is the way
the trend is going. This is completely different from the predictions from models. It is where
there is a huge disconnect between observations, which are showing this very rapid decrease
in area and volume, leading inevitably to the complete disappearance of summer sea ice in a
very short time—“summer” meaning September but extending out a couple of months on
either side. The models predict that this will not happen until 2050 or so. That is a complete
disconnect. As Richard Feynman says, if you have a beautiful model but it disagrees with
data, you must go with the data.

Baroness Symons of Vernham Dean: I should hope so.

Professor Andy Shepherd: Danny should comment on this.

Professor Danny Feltham: The rapid reduction of sea ice in 2007 took the community by
surprise; the majority of scientists were surprised by it, especially the climate modellers.
There are fundamental limitations to our ability to predict the evolution of the sea ice cover.
Part of this issues from natural variability, as we discussed earlier: the natural cycles in the
atmosphere or the ocean and how they affect the ice cover. There is also the fundamental
uncertainty in the intrinsic physics of sea ice, which means that there are limitations in the
models. Notwithstanding that, models are our best way to try to predict the evolution of the
sea ice cover. Simply drawing a line through various data points does not take account of the
physics of the process that is going on, so models have to be our best way of trying to
estimate when the Arctic Ocean will become ice-free. Based on a sift of climate models, the
estimate is currently between 2050 and 2080 to have a reliably ice-free ocean. “Reliably”
means five years with the sea ice extent less than 1 million kilometres squared.
Baroness Symons of Vernham Dean: Forgive me, but that is really extraordinary. You are saying that the modelling shows one thing but the data shows something different.

Professor Andy Shepherd: No, it does not.

Baroness Symons of Vernham Dean: To a layman—I am not a scientist.

Professor Andy Shepherd: I will return to Danny, because he can explain the point, but perhaps I can just add that the CryoSat mission that we lead in my centre—I am the scientific adviser to the mission—shows a dramatic recovery in sea ice volume over the last winter. There was a decline per year of about 2.5% in summer and 8% in winter over the first three years of the mission, but there was a recovery to 8,000 to 9,000 cubic kilometres over last winter.

Baroness Symons of Vernham Dean: What period was this?

Professor Andy Shepherd: Today. The sea ice is thicker and more voluminous this year than it has been in the past four years. There has been a recovery in sea ice. You cannot just take the convenient first three years of measurements and extend them forwards in time. We need a long-term record. Unfortunately, we do not have a satellite mission going back before 2010 that surveyed the entire Arctic, which makes extrapolations of observations problematic.

Baroness Symons of Vernham Dean: Very interesting questions arise about navigation. You are saying this about the last few years, but in 2010 only four ships crossed the Arctic Ocean from Europe to Asia, while in 2013 there were 71 ships.

Professor Andy Shepherd: The sea ice in the Arctic ranges from 1 metre to 5 metres thick in places. It depends on which route you would navigate. Ice-breaking ships can go through 1, 2 and 3 metres of ice. If you have an ambition to get through that ice, you can.
Baroness Symons of Vernham Dean: I know that Lord Moynihan wants to ask questions about that, too.

Viscount Hanworth: I have a quick question. Does the hazard of icebergs affect the northern sea route, or is that hazard entirely confined to the north Atlantic?

Professor Peter Wadhams: The iceberg hazard is mainly in the north Atlantic. There is a small risk in the northern sea route caused by ice islands that break off Ellesmere Island and the north coast of Greenland. These are 100 metres or so thick and you would not want to hit them with a ship. In fact, a submarine that I was not on once hit one, but it is very rare. Shipping in the Arctic is being studied at the moment in an EU project that we are part of. We are concluding that shipping will of course increase very rapidly and is already increasing, but there will be a limit to the growth of routine container shipping, for instance. The pattern of trade means that although it might seem extremely desirable to save a very large distance in trading between the Far East and Europe via the northern sea route or between Europe and the west coast of the US via the North-West Passage, container ships want to have a regular trade route where they can dump containers en route and load other containers, whereas on a trans-Arctic shipping route you have to go from your primary source to your primary destination in one go. Surprisingly, all the shipping experts whom we consulted in our study were saying, “Well, don’t expect an Arctic boom in shipping”. That was even if it becomes ice-free for several months in summer so that you can go through the Arctic safely without needing ice-strengthened ships. The method of shipping cargo these days with containers is simply not conducive to Arctic operations.

The Chairman: We are going to come back to shipping later.
Q146 Lord Hannay of Chiswick: Professor Shepherd, Dr Bacon suggested that you would be able to answer a question that relates not only simply to sea ice but to the general warming and melting of land ice and the correlation with the sea levels. Would you be able to answer that question?

Professor Andy Shepherd: It is a very simple formula: if you warm up the ice on land, it flows straight into the oceans. In Greenland, that has been happening at an accelerating rate. The rate of loss from Greenland has increased by a factor of five over the past 20 years and enough ice is being lost to cause sea levels to rise by about 1 millimetre per year, whereas in the 1980s the contribution was very slight. Most of that is a relatively straightforward physical calculation—it is just the melting of the ice from the surface, in the same way as an ice cube might melt on this desk. Some of it is associated with more complicated behaviour and how the ice speeds up as a consequence of changes in the ocean temperature, perhaps. That is much more difficult to predict.

The amount of sea-level rise associated with a measured amount of ice loss is a straightforward calculation. You transfer a volume or mass of ice from on land into the ocean. There is a simple calculation: 350 cubic kilometres of ice is equal to 1 millimetre of global sea-level rise.

Lord Hannay of Chiswick: And none of the measurements that you have made invalidates that calculation. It is absolutely robust.

Professor Andy Shepherd: It is an absolute calculation in so far as it relies on standard temperatures for the water that it is going into. There will be a small delta associated with the dilution of the oceans, because it becomes less saline, and a very small delta associated with the change in the temperature, which would then reach thermodynamic equilibrium—
Julian is better placed to answer this question—over tens of thousands of years, but this is at the level of 2% to 3%.

The Chairman: Lord Moynihan, did you want to come in on this?

Lord Moynihan: I do, but we will come back to shipping later, as you say.

The Chairman: For questions about things that climate change directly affects, such as icebergs, volume is useful, but we will come on to general shipping later on in the report.

Q147 Lord Moynihan: Fine. I have two quick points. One is that I still want to get my head around, as I think Lady Symons does, this distinction between what is coming out on volume data on the one hand and Professor Wadhams’ view on the other that, based on that data, he would go even sooner than 2020 on the potential for ice-free summers and the modelling, which has taken us not from what we were advised—2040—but potentially further than 2040. There is a disconnect between the two, and I would like you to explore with us in layman’s terms why that disconnect is so great.

The second point, which relates to that, is the evidence that we got earlier from Dr Bacon. I was fascinated by this—and I think you picked up on it very briefly, Professor Wadhams, when you mentioned wave patterns and the impact that that has had on your research recently and on the rapid retreat in the summer ice. Dr Bacon focused on it in the context of turbulence and the impact on that, which no doubt impacts on wave patterns and accelerates the retreat in summer ice.

Could you comment on both those points, Professor Wadhams—then, very briefly perhaps, somebody else on the panel—in order to pick up on the hugely important commercial implications, which you mentioned, for shipping? I absolutely understand your assessment in the context of container ships, but the huge investment that is being made—no doubt on
very strong research, because no board is going to invest on that basis without having confidence in the research by people such as Mitsui and China Shipping—is not so much on the containers but on the huge potential for LNG carriers in the area, with icebreaking equipment attached to them, and the positioning of “Yamal” and the resource that allows you to go through the northern route either going east during the summer, or, indeed, going west during the winter. In that context, surely that is where your shipping boom is going to come: on the hydrocarbon potential—and the LNG opportunity—with some 20% of the global undiscovered reserves within the Arctic Circle, principally within Russian waters.

**Professor Peter Wadhams**: Perhaps I could start by restating my position on the speed at which the Arctic is going to become ice free. Andrew has mentioned that there was a partial recovery of ice volume this summer, but we have looked at the trend. We know that there are fluctuations from year to year and partial recoveries, but the trend, taken over 40 years, is extremely clear: the trend in volume is an accelerating downwards trend, so if we take that trend and extrapolate it—and of course in modelling one should not extrapolate very far when one is dealing with data—models in the long run are how we look at how long-term changes are going to happen, but in the short term we use models, just as Treasury models and many many models that are used in economics and politics do, that are based on taking trends over a number of years and doing a short-term extrapolation to predict what is going to happen in the next short while. The data on ice volume in the summer are very clear: the September data are very clearly so rapidly downwards that even though we know that there will be partial recoveries in odd years, such as this year, that trend will take us down to zero in a very short while—at this rate in just a couple of years. It might seem extreme to be
Professor Daniel Feltham, Professor Andy Shepherd and Professor Peter Wadhams – evidence (QQ 29 – 36)

predicting that we might see an essentially ice-free Arctic in September in a year or two, but I still hold with that prediction.

**Lord Hunt of Chesterton:** May I just say something on that point? I have been really very quiet.

**The Chairman:** Perhaps I can ask our panel to speak quite concisely in answering Lord Moynihan’s questions first, because we are quite short on time. Then we can move on to other things, such as the transport aspects, as well. I think Professor Shepherd also wants to come in.

**Professor Peter Wadhams:** If I could just finish that point, that might be an extreme prediction, but it will still happen in a very small number of years. It is certainly not going to be 2050, although that might be the date on which we start to see an ice-free Arctic for much of the year rather than for a short period in the summer. If we are looking at the summer, we are talking about September and then extending out by about two months either side, because the August/July extents are coming up behind quite quickly.

Regarding the mechanisms that you mentioned—the turbulence question—the whole retreat seems to be a ratchet that is going only one way, because as soon as you have a large retreat of sea ice in the summer it changes the whole ocean circulation and changes the ocean into a non-polar ocean, as Sheldon said. You get a lot more turbulence and a lot of waves. In the study that we are doing at the moment with the US navy, we are putting buoys in to measure wave penetration into the ice, because the waves in summer now are sufficient to break up the ice and cause it to retreat faster still. All the mechanisms seem to lead towards an increased retreat rate. Nothing is leading us to suppose that there will be
any decrease. That increased retreat rate will give a longer and longer period each year when the Arctic is suitable for navigation.

Professor Danny Feltham: Can I just make a point of clarification? I mentioned earlier the climate models predicting that the Arctic will become reliably ice free in around 2050. I reiterate that this means less than 1 million kilometres square for five years in a row. The role of natural variability is such that you expect an ice-free Arctic some time before that. You might expect an ice-free Arctic in, for example, 2030 for one year, but the ice would then recover, so we are talking about reliably ice free. That is what the climate models say: around 2050 to 2080.

Professor Andy Shepherd: I will try to be quick. The problem is the density of the observations that we have had in the past, which are the very best observations that we can rely on. If I hold up this piece of paper and ask you how many fingers I am holding up, you have no idea. You can see two of them but there are actually four. This is what we have with the measurements that are collected from sparse submarine tracks. The sea ice pack is like a Jaffa cake: it is thick in the middle and thin at the edges, and if you are only measuring the edges in one year from time to time you cannot measure the thickness in the middle. It is worse than a Jaffa cake, because it is moving around as well. You cannot return to the same place and time to measure the same thing. From the data that we have for the past four years—and it is only four years—which are the most reliable and comprehensive assessment of the ice volume in the Arctic that we have, in 2010 by the end of summer there were 10,000 cubic kilometres, in 2011 there were 9,000, in 2012 there was 8,000, and in 2013 it rose to 10,000 again. Based on those four years of data, we could not extrapolate with a negative trend.
The Chairman: I think we will leave the shipping question for another session. Lord Hunt, did you want to ask a question very briefly on this aspect?

Lord Hunt of Chesterton: I just wanted to say—

The Chairman: Is it a question?

Q148  Lord Hunt of Chesterton: It is a comment and a question. I wanted to summarise what you have both said, which was that the original computer models, which did not forecast this rapidity, had many simplifying features; they did not include some of the processes that we now know, so that was how they got that answer. Peter Wadhams was looking at other questions; he is a wave man, so that was in there. Anyway, you asked what the problem was. The answer was that to change the Met Office climate model is a big thing, and I know this myself: it might be 10 years before something happens, whereas an individual can look at new elements.

The question that I was asked to ask was: to what extent can we work with the EU and Russia? That is the point. We work with ISA and so on, but surely with ships and all these resources we should really be having a much more significant role between the EU and Russia in order to focus on these problems. Do you think we are moving towards that?

Professor Peter Wadhams: Perhaps I can mention one Russian collaboration that has started and is, I think, very important. It is via an EU programme but it is led from Britain, and it has in it a British Antarctic Survey co-ordinator, Cambridge University and 25 other partners in Europe. It is called ICE-ARC and it is devoted to the question of the rapid Arctic change and the impacts.

One of the impacts which the Russians are studying and which we are now working with them on is the emission of methane from the Arctic offshore. This is a much more serious
and immediate problem than methane emissions from tundra, and it is going to build up to
be an extremely serious problem and have an extremely serious impact on climate change
over the next few decades. The immediate fear is the emission of methane from shallow
offshore waters off the east Siberian shelf in the Arctic in the summer. The Russians have
been studying this for a number of years in a joint programme with the University of Alaska.
We are now joining in and going up there with them, and we are already seeing methane
plumes being emitted from methane hydrates, which are being released because the
offshore permafrost is now thawing, because the water in summer is warmer because of the
sea ice retreat. This is an unprecedented situation: the retreat of sea ice in the summer
leading to warmer offshore waters over the shallow shelves of the Arctic, which is leading to
offshore permafrost thawing, which is leading to a methane hydrate release as methane—

Lord Hunt of Chesterton: This is not in the American document.

Professor Peter Wadhams: I think it is a serious and immediate problem. It is probably the
most important problem that we are facing in the Arctic, and we need to study it most
strongly. Access to the area is difficult, and this Russian-American collaboration has been the
only way in which this can be done. It is done every year, but now the EU is coming in on it
and we are partners in it, so we will be going out there with them from this year on.

The Chairman: I am aware that it is 12.30 pm. Is the Committee happy to go on until 12.45
pm? No. We have a number of questions that we have not completed at this point that
relate particularly to the scientific side. Perhaps we could very briefly ask question 7. We
have UK scientific expertise and I think we have done a lot on that, actually. The one
question that we will finish very quickly with relates to a different aspect. Perhaps Lord
Addington can ask it and we can have a quick answer from each member of our panel.
Q149 Lord Addington: It is a bit of a jump across, but what in your view are the negative impacts of the further reduction in sea ice cover likely to be, and are there any positive impacts?

Professor Andy Shepherd: We already heard in the first session that there are many potential negative impacts: things such as the loss of natural habitats and ecosystems, impacts on local communities, increased pollution, the risk of oil spills, changes in atmospheric circulation patterns that will affect the Arctic itself and elsewhere on the planet, and an increase in storms. We have heard that the loss of Arctic sea ice might present some shipping opportunities. Peter has explained that industrial-scale commercial shippers might not see it in the same way, but tourist opportunities might be presented. It might reduce the economic costs for offshore exploration, for example. These are potentially positive implications, but that is essentially just an economic consideration, because you can still do all those things: they just cost a lot of money right now. I know that the Chairman asked the Committee not to consider the wider implications of Arctic change, but you should not lose sight of the fact that changes in the Arctic climate system impact on the rest of the planet, which impacts on finances in countries elsewhere on the planet, and the economics ought to be balanced against those considerations. If you were minded to do that, you would reach a different number than you would just by thinking about the commercial advantage of exploiting the Arctic itself. The real problem, of course, is that the commercial gains are in the private sector but the losses are borne by the public sector and consumers, and that makes this issue very easy to politicise.

Professor Peter Wadhams: Thinking about economics, we did an economic study of the implications of a large methane release from the east Siberian shelf. We assumed a 50
gigatonne release over 10 years, which had been predicted on the basis of observations done so far, and applied the PAGE model, the economic model that was used in the Stern review, which came up with a $60 trillion cost over a century. That is a staggering figure, but it represents about a 15% increase on the total economic costs of anthropogenic global change, which is even more staggering, and this is simply one effect of Arctic sea ice retreat, which is the uncovering of Arctic shelves and the enhanced release of methane from the Arctic offshore. Apart from producing a 0.6 degree increase in global warming within 20 years, it will also produce a $60 trillion cost over 100 years. That puts into the shade the economic gain from Arctic shipping and the increased ease in oil exploration and transport. Those will both be quite large benefits, but they are orders of magnitude less than the cost to the planet of having to cope with a very large methane outbreak, which is a significant enough risk that we should regard it as a top priority for studying.

**Professor Danny Feltham:** I suppose that most of my negative and positive impacts have already been mentioned. A decrease in sea ice cover will certainly increase local warming, but it will also lead to increased global warming from the decrease in the reflective ice cover. It will have impacts on the Arctic Ocean circulation: vertical mixing will affect ecosystems. There are also possible pathways whereby a change in sea ice cover can affect the climate more globally and in the UK from changing ocean circulation patterns—Sheldon mentioned the impact on the Gulf Stream—and from changing atmospheric patterns: longer periods of rain, for example, might be one outcome. There are various negative impacts that one can imagine might occur.

The positive impacts boil down to oil exploration, navigation, tourism and other such things, and as Andrew said these are largely in private industry.
The Chairman: Thank you very much indeed for your evidence. We were a little rushed at the end, for which I apologise. Thank you very much indeed for your contributions. You have given us a very good foundation on the environmental side to move forward on. I hereby end the public session and perhaps ask people if they could leave the room so that if there is any other business we can conduct that. I suspect there will not be.

Professor Andy Shepherd: Can I submit written evidence in response to the questions?

The Chairman: Yes.
Submission to be found under Dr Sheldon Bacon
HE Foo Chi Hsia and HE Keiichi Hayashi – Oral evidence (QQ 302 – 310)

Evidence Session No. 24  Heard in Public  Questions 302 - 310

TUESDAY 25 NOVEMBER 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Viscount Hanworth
Lord Hannay of Chiswick
Lord Moynihan
Lord Oxburgh
Lord Soley
Lord Tugendhat

Examination of Witnesses

HE Foo Chi Hsia, High Commissioner for Singapore to the United Kingdom, and HE Keiichi Hayashi, Ambassador of Japan to the United Kingdom

Q302  The Chairman: Your Excellencies, High Commissioner and Ambassador, can I welcome you to the House of Lords Select Committee on the Arctic? We are very pleased that you could join us this morning for this evidence session, which is one of the last of our evidence sessions that we are taking as part of this report. I hope you have had a copy of all of the Committee Members’ interests so that you are aware of those. Perhaps I could ask you to briefly introduce yourselves. We are being broadcast live on this evidence session. We will then continue the questions after that. Perhaps, High Commissioner, I could ask you to go first and then ask you, Ambassador.

Foo Chi Hsia: Sure, it would be my pleasure. Good morning everyone. My name is Foo Chi Hsia. Hsia is my first name, Foo is my family name. I have been the High Commissioner to the UK since September this year. As a result of our Arctic interests, I am also concurrently accredited to Iceland as the Ambassador to Iceland and to Ireland.
The Chairman: Thank you. Ambassador, would you introduce yourself?

Keiichi Hayashi: Thank you, my Lord Chairman. My name is Keiichi Hayashi. I am the Japanese Ambassador to the UK. I am not accredited to any other country. I have not served in the Arctic yet, but I did serve among the Arctic countries in the US and Washington. I have been Ambassador here for just about four years now. Thank you very much.

The Chairman: Ambassador, do you wish to make a few points as part of question one, perhaps? Let me ask that and then we can carry on. To begin with, what are the interests and priorities of Japan and Singapore in the Arctic? Has your level of interest in the Arctic region increased in recent years? If so, why? Obviously, this is within the context of both your nations being permanent observers to the Arctic Council now. Ambassador, do you wish to start?

Keiichi Hayashi: If I may, yes; thank you, my Lord Chairman. In our view, global warming is bringing about environmental changes in the Arctic, such as the melting of sea ice, permafrost, ice sheets and glaciers. This not only presents the international community with economic opportunities, such as the possible availability of the Arctic sea route and better access to natural resources like gas and oil, but has an effect on the vulnerable natural environment as well. Japan recognises that such opportunities and challenges, if I may say so, could affect not only the Arctic but the entire globe. That is why Japan believes that it is necessary to tackle these interests and challenges based upon a wide range of international co-operation, while respecting the centrality of regional states and Arctic-indigenous peoples.

There are two major tasks for the international community to tackle such challenges and make the most of emerging opportunities. The first is to grasp, based on scientific research, what is going on in the Arctic and its impact on the global environment in order to precisely predict further changes and take necessary measures to tackle and perhaps minimise negative impact. The second is to reach a common understanding on appropriate manners of economic use of the Arctic. Let me stop here.

The Chairman: Thank you. High Commissioner, would you like to comment?

Foo Chi Hsia: Yes, my Lord Chairman. It would not surprise you that our interests are similar to Japan’s and those of other observers of the Arctic Council on three levels. One is the rising
sea level, two is the new sea routes that will have implications on all of us, and three is the development and implementation of international law.

As you will all know, Singapore is a small low-lying island. It is half the size of London at just over 700 square kilometres. Despite the fact that we are half way around the globe from the Arctic, at the equator, we are especially vulnerable to rising sea levels as a result of the melting Arctic ice. Much of Singapore lies only about 50 metres above mean sea level and about 30% lies less than five metres above. We have obviously noticed that the mean sea level in the Straits of Singapore has been increasing by about three millimetres per year over the last 15 years and could rise up to 0.65 metres by 2100. It is therefore almost existential for us to have access to scientific studies on any dramatic changes in the rising sea level in order for us to put the necessary adaptation measures in place on time.

The opening of sea passages will of course have an impact on Singapore’s shipping and maritime interests, but we see it both as a challenge and, as the Japanese Ambassador has mentioned, equally as an opportunity. With the shortened sea between northern Europe and north-east Asia, there are potential implications for Singapore’s status as the maritime sea hub along the Straits of Malacca and Singapore. We think that the shipping conditions in the Arctic will probably remain difficult for the foreseeable future, but of course this could change quickly and, again, we would like to pre-position ourselves, should there be any such changes. However, there are also opportunities for us. The improved access, as well as access to natural resources in the region, has increased economic opportunities. As a result, we think that some of our companies will be able to provide supporting services.

Finally, it is important to make clear that clearly we have no territorial or resource claims in the Arctic region, but we do hope that these claims will be resolved peacefully in accordance with international law. Upholding the freedom of navigation as prescribed under the UN Convention on the Law of the Sea is paramount to Singapore, and measures taken by Arctic states to regulate shipping and other maritime activities for navigational safety and environmental protection must therefore be consistent with UNCLOS and all other aspects of international law. That is where Singapore’s interests really lie.

Q303 The Chairman: Thank you. I apologise: we seem to have the builders in. We will see if we can fix that. If I could just follow up briefly on a couple of issues, Ambassador, one of the things we have come to learn is, of the Asian nations, Japan has a long track record in
Antarctic research. I wondered how relevant that was to your work in the Arctic for the future and whether you saw that as an important track record or that it was helpful to have both of those aspects.

Perhaps I could also ask both of you another question. One of the characteristics of the new intake of permanent observers was very much the Asian interest. I am interested to know whether you think there is a competitive race in Arctic interests from the Pacific and from Asia at the moment. Is that a factor?

**Keiichi Hayashi:** Thank you, my Lord Chairman. Japan was allowed to be an observer on the Arctic Council only recently, but Japan’s involvement or experience in both Arctic and Antarctic affairs is very long. We informally set up a section or division to deal with what we call polar affairs, both Antarctic and Arctic, more than 50 years ago. Our primary interest, however, was more observatory, exploratory and scientific. We kept on sending our Antarctic missions for a long time. For the Arctic, probably because of the lack of a continent there, our activities remain more or less observations via satellite or sending some observation missions occasionally. However, the interest in the Antarctic certainly overlaps with our interest in the Arctic, but now our interest in the Arctic has assumed a new aspect of economic interest and much more pressing environmental concerns.

That is why back in 2009 we applied for observer status on the Arctic Council. The economic interest I briefly mentioned in the beginning covers this possibly shortened northern sea route, which should cut the distance between Japan and, say, a major port in Europe like Hamburg or Rotterdam by 40%. That would offer economic benefit first of all, but it would diversify our maritime routes, because we are heavily dependent on the Indian Ocean, the Strait of Malacca and the Philippine sea lanes. Of course, that has been recently plagued by piracy as well. In that context, an alternative route would give us much more leeway, and that is very welcome. Of course, the global concern with the environment is something else. Japan’s status as a global economic power necessitates that Japan is heavily involved in global environmental protection, so we are very happy to provide whatever expertise we have accumulated over our more than 50 years experience in observation and exploration.

On the second point that you raise, my Lord Chairman, I think my Singaporean colleague would certainly be happy to point out the frequent dialogue that we hold with Asian countries, including Singapore. A recent example is the ministerial conference that we held
on a trilateral basis with Japan, China and Korea in August this year, just a few months ago. There was a ministerial conference on transport and logistics, which was attended by the three relevant Ministers from Japan, China and Korea. They indicated their interest in Arctic matters and they agreed in a joint statement that the three countries will make efforts for mutual co-operation on the northern sea route through exchanging information. There is awareness of the need for co-operation.

The Chairman: That is very useful. Thank you.

Foo Chi Hsia: As the newest permanent observer on the Arctic Council, Singapore is obviously the new kid on the block. We are just beginning to develop our own expertise and capacity on Arctic issues, including research activities. I could briefly talk about some of the new things that we are starting, including a Centre for Offshore Research and Engineering at the National University of Singapore, which is studying the pattern of the break-up of sea ice and how it affects offshore structures. Given that we are relatively new at this, the Government are also partnering with the same university, the National University of Singapore, to set up an Arctic affairs programme. This includes a study by the NUS Centre for Maritime Studies on trans-Arctic shipping routes. We have also provided research fellowships on Arctic legal issues under the NUS Centre for International Law. Under this fellowship programme, we have appointed a former legal adviser from the US Department of State, Captain Ashley Roach, as a research fellow in order to build up our own knowledge on international law pertaining to the Arctic.

Our companies are also developing their own Arctic capabilities through industrial research activities. For example, Keppel is a company that is also working with the National University of Singapore Corporate Laboratory, which was set up in collaboration with the National Research Foundation, which I think Lord Oxburgh will be very familiar with, to undertake research in many areas, including Arctic technology and offshore industry. At this point in time, we have not collaborated with other states on Arctic research, whether Asian or otherwise, but we are certainly looking forward to the opportunity to work with others in order to advance Arctic interests.

The growth in interest by Asian states that you were asking about is a natural reaction to the global implications of developments in the Arctic. We recognise that there seems to be a proliferation of activities, but it is inevitable when the interest is so great. At this stage, the
more activities the better. Bringing knowledge and awareness to Asia is important, given the broader implications, so that we can all understand the issues better and develop our response to it better as well. Thank you very much.

**Lord Soley:** High Commissioner, you said, if I heard you right, that some of the research that is being done was on the effect of the break-up of ice on offshore installations. Is that sort of research being done because of the interests of the insurance companies or because of the interest that you might have as companies to start doing that sort of work?

**Foo Chi Hsia:** It would be a bit of both. Given that many of our companies include port companies as well as companies that build offshore oil rigs and other platforms, we would want to be able to know the implications of building ports and other structures over sea ice as opposed to the normal environment that we are more familiar with.

**Lord Soley:** Insurance is a key factor for you, is it not?

**Foo Chi Hsia:** It could be, yes.

**Q304 Lord Tugendhat:** High Commissioner, I listened very carefully to what you said, and you were very frank about the difficulties for Singapore about the Arctic route, but could I press you a little further? The whole raison d’être of Singapore, the reason it was established where it is, was because it is astride the main sea route from Asia to Europe. It would seem to me that once the technical difficulties are solved, the northern sea route is really going to be something in the nature of a commercial catastrophe for Singapore. It will mean that instead of having 100% of the traffic between Europe and Asia, you will have a viable competitor. You will no doubt maintain a substantial percentage, but just as Singapore airport has suffered from the rise of Dubai, so Singapore as an entrepôt will suffer from the rise of the northern sea route.

**The Chairman:** Before you answer that, that is part of the question that Viscount Hanworth is going to ask.

**Viscount Hanworth:** My question has been totally pre-empted, in fact.

**Lord Tugendhat:** I am so sorry.

**Viscount Hanworth:** No, not at all. There is no need for an apology.

**The Chairman:** Lord Hanworth, is there something you would like to add to that?

**Viscount Hanworth:** We need to know the consciousness of the two nations of these economic potentials. What is being done to prepare for them? Is there an ongoing debate
about some of the threat that Lord Tugendhat has mentioned? That was very much the question I was going to ask, but I will ask something else subsequently.

**The Chairman:** High Commissioner, would you like to start on that? Then we can hear from you, Ambassador.

**Foo Chi Hsia:** Perhaps it is useful to start by explaining the context of the maritime industry in Singapore. Certainly it started off as an important sea route; you will be more than familiar with our history. The maritime sector continues to contribute about 7% of Singapore’s GDP. It is significant, but it is not an overwhelming part of our GDP. It employs 150,000 people, and we are home to more than 5,000 maritime-related establishments. Ports and shipping are part of those establishments, but many other maritime-related establishments have since been set up in Singapore as well.

It is true that Singapore is located along the Straits of Malacca and Singapore, through which each year we ship half of the world’s annual supply of crude oil. Singapore receives 120,000 vessels and ships about one-seventh of the world’s shipping containers a year. We are also the top bunkering port in the world for bunker sales. The possibility of a diversion of sea routes would of course have implications for Singapore but with the faster growth in trade among Asian economies, which account for 40% of the world’s shipping tonnage, we believe Singapore will remain well placed to leverage these growth opportunities, including as an international maritime centre beyond shipping and port-related activities, in other maritime-related services and offshore and marine-engineering activities, which is why I spoke earlier about how it is both a challenge for Singapore as well as an opportunity.

As one of the world’s premier hub ports, Singapore can develop in the related service industries that we are also developing. Some of our expertise, including on port management, operations and regulation, can be adapted for the Arctic. In that sense, developments in the Arctic could present opportunities for us as well as the development of what we call our external economy beyond the direct possible implications to our internal domestic economy, which, again, as I mentioned, could be unlikely in the short term.

**Viscount Hanworth:** I take it, then, that you think there is an assured maritime future for Singapore, regardless of what happens on the northern sea route, which may not be imminent. There is a very different tack that I want to pursue. It is a simply a point of clarification. I have a document here that says the direct threat of melting of the sea ice to
the city state is considerable, given that it is just 163 metres above sea level. That is a very confusing statement. It is Bukit Timah that is 163 metres above sea level, is it not?

**Foo Chi Hsia:** That is right, yes.

**Viscount Hanworth:** You mentioned that the preponderance of the land mass is only 15 metres.

**Foo Chi Hsia:** That is right.

**Viscount Hanworth:** In my perception, which is a rather recent one, there is a lot of low-lying ground in Singapore that would be threatened by a one-metre rise. Do you have any handle on those scenarios of rising sea level and the implications it would have for the land mass?

**Foo Chi Hsia:** Yes, absolutely. As I mentioned earlier, much of Singapore lies 15 metres above the mean sea level.

**Viscount Hanworth:** Much lies a lot lower as well.

**Foo Chi Hsia:** Yes, exactly—30% lies less than five metres above mean sea level. We have been able to put a long-term adaptation strategy in place. That includes the possibility of doing land reclamation above and beyond our normal level above sea level, so we are increasingly raising and elevating the sea level of Singapore. We are looking at different technologies, including floating platforms, such that it is not dependent on the sea level; you are going to operate on a floating platform regardless of the sea level. Many of our interests in the Arctic include the fact that when we look at the melting ice caps, theoretically the water flows around the globe, but due to magnetic fields and other factors there is a higher rise in sea level for places closest to the equator. Precisely for those reasons, we want to be able to have the advance-warning mechanism in order to put in place the adaptation measures as early and effectively as we can.

**Viscount Hanworth:** The matter is very much in consideration at the moment. I ought to ask the Ambassador something about the prospects of the northern sea route for Japan, because it would be a rather different scenario from the one that affects the prospects of Singapore.

**Keiichi Hayashi:** Thank you. As I said in the beginning, this possible northern sea route would certainly be a welcome development only from the perspective of the diversification of our transport routes. However, at the same time, we are very much concerned about the environmental impact. First of all, the northern sea route is not available throughout the
year. It may be increasingly available because of the melting of ice and glaciers and so on. Whether that itself is a welcome development or not is a big question.

Even if it becomes available, we must also be very aware that the ecological and environmental system in the Arctic is very vulnerable, and because of the nature of the Arctic it takes decades to restore once damage is done by, for instance, collision or grounding accidents. In our view, in considering this option it is extremely important that we should make sure that the activities in the Arctic area, including shipping, are done safely and in a way that should not impose heavy strain on the vulnerable environment. In that context, Japan would like to continue to do such protected activities through Japan’s scientific expertise and technologies that have been accumulated over half a century.

May I just mention some more practical aspects? For the trans-Arctic route to be established as a viable, practical new sea route, there are a number of challenges to be overcome in terms of the measures and information necessary to ensure safe navigation and security. There is also an issue related to security in how Russian domestic regulations will be implemented in relation to vessels operating there.

**The Chairman:** Do you have a concern about that, Ambassador? Will Russia be over-onerous or go beyond their remit under international law?

**Keiichi Hayashi:** As the High Commissioner from Singapore briefly mentioned, whatever the regulations are, they will have to be in accordance with international law, because we have one specific article under UNCLOS in relation to that whole region. However, the interpretation of this particular provision is not so unequivocal yet, so there is room for different interpretations on one hand. Also, the actual meaning and implementation of Russian regulations are not so clear yet.

**Viscount Hanworth:** I really wanted to discover the alacrity with which Japanese industry is reacting to an imagined economic prospect, but I suppose this is so imponderable we cannot at this stage say anything.

**The Chairman:** Perhaps, Viscount, I could take a couple of brief supplementaries. If we could make questions and answers quite short, that would be quite useful at this stage.

**Q305 Lord Moynihan:** Both your Governments have clearly done a lot of work on this. The absolutely key issue for us is to receive an appreciation on the timing of when you believe the northern sea route will be commercially feasible. You have given us a whole variety of
different reasons as to the difficulties: it is only navigable during the summer; the Russian regulatory framework; the requirement of icebreaking capability, which clearly is going to add to shipping companies’ fuel costs; and safety risks, as search and rescue capacity is not in place on the northern sea route. Are we talking, in your view, about five, 10, 50 or 100 years ahead before this becomes commercially feasible? Could you give us a figure for when you believe a commercially feasible sea route will exist?

Keiichi Hayashi: I wish I could, but I do not have any specific figure.

Lord Moynihan: Do you have an idea? Are we talking about 20, 60 or 100 years?

Keiichi Hayashi: My Lord, on the one hand we are trying really hard to protect the Arctic environment in trying to stop global warming. If successful, that should have a negative impact on the early availability of the sea route, so we are in a rather ambivalent position here. For the time being, the availability of the sea route is considered from a business perspective to be very limited. Even if the Russian regulations were clarified, it would not instantly give us an opportunity to make use of the sea route.

Of course, for instance, in the context of the development of the well known Yamal Peninsula project, there are a number of vessels that have to be tracking this sea route for the purpose of the project. When the project is completed, I think the liquefied natural gas will have to be transported through this route, and it may become more frequently used, but it does not mean that we will have this Asia-Europe route instantly available. I am sorry that I cannot give you specific figures, but that is where we stand now.

Foo Chi Hsia: I completely share the view of the Japanese Ambassador. That is precisely why we sought observership in the Arctic Council: to get more information and do better studies to plan for an eventuality that might be more medium term than short term.

Lord Moynihan: What is the difference between short term and medium term in this context?

Foo Chi Hsia: Short term would be within, perhaps, one term of Government.

The Chairman: Touché. That is a very good answer. We all understand that answer. That is a really good question by Lord Moynihan. Basically, what you are really both saying to the Committee is that this is almost impossible to determine and that you cannot plan for it. Are you saying that? I do not know. Is that what comes over?
**Foo Chi Hsia:** We are constantly planning for all scenarios, which is probably the best thing to do for a country like Singapore.

**Keiichi Hayashi:** Yes, from that perspective we will continue to make all possible preparations for the eventuality of the route being available. In the meantime, we certainly would like to make efforts to grasp what really is going on in the Arctic. That is the reason why we wanted to be part of the Arctic Council.

**The Chairman:** Lord Addington, you had a brief supplementary.

**Lord Addington:** It might even be a point of clarification now. When I was the Committee’s representative in Reykjavik at the recent conference up there, we heard suggested by one of your near neighbours’ major shipbuilders, Daewoo, that they might want to toughen up ships to go and try the northern sea route by itself. I take it that there would be no great enthusiasm for building specific freight carriers to be able to try this by themselves, because it does seem to be slightly high risk, very expensive and getting into insurance trouble. That sort of attitude would be something that you would not have a good attitude towards.

**The Chairman:** A quick comment would be useful.

**Keiichi Hayashi:** It would be dependent primarily on commercial considerations, and the Government are not in a position to encourage the companies to take risks, because there are so many unknown factors at the moment.

**Foo Chi Hsia:** Likewise, there is no reason Singapore should be doing anything like that.

**Q306 Lord Oxburgh:** One of the considerations, of course, during the economic development of the Arctic is the effect on indigenous peoples. You both have countries situated quite a long way from that. I wonder whether either of you are able to make any comment on the effect of management of economic development on the indigenous peoples.

**The Chairman:** You have the wrong question. I am sorry. Lord Oxburgh, do you want to rephrase that?

**Lord Oxburgh:** My papers seem to have different questions. Can we talk a little about your research activities in the Arctic and how you see investment in Arctic research and, indeed, in co-ordination?

**The Chairman:** Any issues that are around the indigenous-people side that you get involved in, in terms of observer status, would also be useful for us.
Keiichi Hayashi: In the initial statement, I mentioned that Japan feels that it is necessary to tackle these challenges while respecting the centrality of regional states and Arctic-indigenous peoples. That is already incorporated into the central tier of the Arctic Council, and we respect that element. When I talked about the challenge to make the most of emerging opportunities, that certainly includes the exploitation of natural resources in the area. We are conscious and aware that that would affect the lives of indigenous peoples, and we certainly want to respect their life pattern.

Foo Chi Hsia: From Singapore’s perspective, we fully recognise that Arctic states and the people who live in the Arctic are, in fact, the primary stalwarts of the Arctic region, and this is why we are quite actively working with indigenous communities to exchange experiences on how to adapt to change. For example, we have invited representatives of the Arctic Council permanent participants to visit Singapore for customised study visits each year to exchange experiences of common areas of interest and co-operation. In fact, the most recent visit took place earlier this month, where people from the Aleut International Association, the Arctic Athabaskan Council, the Russian Association of Indigenous Peoples of the North and the Sami Council came to Singapore to exchange views with our officials on various aspects of social and economic development, including heritage preservation, climate change strategies, biodiversity conservation, and maritime port and coastal management.

We also provide full scholarships for short training courses on various aspects of public policy and administration, including public health, education, port management and climate change adaptation. All these courses are offered under what we call the Singapore Co-operation Programme. We also offer a postgraduate scholarship every year for a one-year masters in maritime law at the National University of Singapore that is open to Arctic-indigenous people. That would be how we are working quite closely, I believe, with indigenous communities in the Arctic.

Lord Oxburgh also spoke about some of our economic interests. I mentioned earlier that we obviously have no territorial or resource claims, and we recognise the importance of responsible Arctic resource development. We have some capacity and experience in logistics in the maritime and offshore sectors, including—it might be a surprise to some people—icebreakers, ice-class vessels, and the construction of offshore rigs for use in Arctic conditions. A Singaporean company, Keppel Sea Marine, part of the Keppel Offshore &
Marine Group, was in fact the first Asian company to build icebreakers, completing two for the Russian company Lukoil in 2008. Keppel Sea Marine is currently building two other ice-class supply vessels and an ice-class duty rescue vessel, which will operate in the northern Caspian Sea. We are also conducting research on green rig technology. The same company, Keppel Offshore & Marine, is currently collaborating with ConocoPhillips to conceptualise the world’s first environmentally friendly Arctic green rig, bearing in mind the importance of protecting the fragile Arctic environment.

Q307 Lord Hannay of Chiswick: I wonder if we could look at your two countries’ active involvement as observers on the Arctic Council. Could you say a little about what both Japan and Singapore are doing to make an effective contribution to the work of the Arctic Council? It would help the Committee a great deal if you could give a certain amount of specifics about this. Have Japan and Singapore raised any issues at the Arctic Council on their own? How do you prioritise the work of the Arctic Council in terms of your involvement, i.e. which bits of it interest Japan and Singapore and what do you do about making those interests known to the members of the Arctic Council?

Keiichi Hayashi: First of all, I should be talking about the basic attitude of Japan in relation to international co-operation. We believe that a prerequisite of international co-operation in the context of the Arctic is first of all the rule of law. We certainly want territorial disputes and maritime delimitation issues in the Arctic to be settled peacefully in accordance with international law.

From that perspective, Prime Minister Abe has announced the policy of proactive contribution to peace based on the principle of international co-operation. To the best of our ability, we are ready to contribute to international efforts to make best use of the opportunities emerging in the Arctic and also address the challenges I outlined earlier. More specifically, we are concerned with developing a international joint research exchange programme not only with the Arctic countries but with other observer countries such as the UK by making the most of Japan’s historically accumulated expertise in science—observation and research of the Arctic, as well as advanced technology. Japan will feed back as much as possible on the outcome of initiatives relevant to international fora such as the working groups and task forces of the Arctic Council.
In Japan, we have what we call the National Institute of Polar Research and the Japan Agency for Marine-Earth Science and Technology. The experts from these organisations have made presentations at Arctic monitoring and assessment programmes about the present state of Japan’s Arctic research, which enjoyed a positive assessment. In addition, Japan’s experts participated in the writing of the report by the programme. On top of this, Japan dispatches experts to the Conservation of Arctic Flora and Fauna working group, the Task Force for Enhancing Scientific Co-operation in the Arctic and the Task Force on Arctic Marine Oil Pollution Prevention, where they make a contribution to the discussions. All these contributions are based on the cumulative expertise and knowledge we have gained over the past 50 years.

**Q308 Lord Hannay of Chiswick:** Thank you, Ambassador. If you can forgive me for saying so, most of your response was at a high level of generality, although in the latter part, which related to the work of the task forces, you gave some specific examples. Could you perhaps say whether Japan has ever intervened in a discussion in the Arctic Council in its place as an observer or whether it is purely a silent observer simply reporting back what other people are saying?

**Keiichi Hayashi:** My Lord, it comes back to one question that we have been raising, which is the current status of observers in the Arctic Council. In the current internal guidelines of the Arctic Council, the roles that observer states are expected to play are not very clear, from our perspective. There are various restrictions of a fairly limited scope. Restrictions are imposed on the scope of contributions that observers can make. From our perspective, we would like to make a much bigger contribution by providing scientific expertise and advanced technology for the Council’s activities under the current structure. From our perspective, if you want us to make more contribution, it would help if the council made it easier for the observer states to make a contribution by expanding the scope of engagement.

**The Chairman:** Ambassador, we will come on to reform in question six.

**Lord Hannay of Chiswick:** It is quite an important point. I want to just follow it up.

**The Chairman:** Yes, absolutely.

**Keiichi Hayashi:** I am sorry that I cannot be very specific, but I cannot give exactly what these experts have offered. If I could, perhaps I ought to give you a better idea. However, I am
saying here that our contribution would have been expanded with changes to the status of observers.

**Lord Hannay of Chiswick:** Thank you. That is very interesting and helpful. However, am I right therefore in feeling that the view of your Government is that you wish to contribute more, but you are inhibited from doing so by the way the Arctic Council does its business and deals with observers on the Council? That is an interesting point. I deduce from what you say that it is a little like when President Chirac said, at a certain moment in a quite different context, “This is a good moment to keep quiet”. Is that the role of observers?

**Keiichi Hayashi:** Japan has just been admitted to observer status, and I do not want to be seen as making complaints. However, all I am saying is that we would be very happy to expand our contributions, if we were given a greater role in the Arctic Council.

**Lord Hannay of Chiswick:** Thank you very much.

**Foo Chi Hsia:** My Lord Chairman, if I may, Singapore believes that decision-making at the Arctic Council is the responsibility of Arctic states, which hold sovereign rights and territorial jurisdiction in the Arctic region, as well as the Permanent Participants, who are afforded full consultative status at the Council. Just talking about the structure of the Arctic Council, it allows observers like Singapore to make a full and meaningful contribution at the level of the working groups and task forces, so we have contributed in five quite specific areas in which we believe we have some experience and expertise and converge with the work of the Arctic Council.

The first area is in the development of safe Arctic shipping. We spoke about how Arctic shipping should be based on a rules-based international legal framework, and we support the adoption of the Polar Code at the International Maritime Organization. We participated actively in the discussion of the Polar Code at the IMO and we look forward to its adoption at the 68th session of the IMO’s Maritime Environment Protection Committee in the middle of next year. We also have a track record of responsible maritime policies, including preventing oil spills as well as vessel-traffic management. As such, our maritime agencies have participated in meetings of a number of Arctic Council working groups related to Arctic shipping like the Protection of the Arctic Marine Environment working group, the Emergency Prevention, Preparedness and Response working group, including the Task Force on Arctic Marine Oil Pollution Prevention. At an Emergency Prevention, Preparedness and Response
working group meeting in November 2013, the Maritime and Port Authority of Singapore shared our experience in oil-spill management, particularly the clean-up effort and lessons learned from the collision of two crude oil tankers in the Straits of Singapore in 1997.

The second area in which we contribute to the Arctic Council is in Arctic biodiversity conservation. Singapore is one of 22 countries, including Russia, China and Australia, that lie along the East Asian-Australasian flyway, and is an important stopover point for migratory shorebirds. Our Sungei Buloh Wetland Reserve is home to over 230 species of birds, about 50% or 118 species of which are migratory, so many Arctic migratory species are threatened by overharvest and habitat alteration outside the Arctic. Singapore recognises and believes that it can play a role in the conservation and monitoring efforts of these birds’ populations.

The Singapore National Parks Board therefore provides data on Arctic migratory birds passing through Singapore to the Arctic Migratory Birds Initiative under the umbrella of the Conservation of Arctic Flora and Fauna working group. The Sungei Buloh Wetland Reserve is also assisting as a capacity development centre for regional sites, providing training and assistance to improve site management, protection strategies for migratory birds and population census technologies.

**The Chairman:** High Commissioner, this is really important evidence, but I need you to summarise a little more at the moment because of time. However, if you would like to submit that to us in detail, that would be very useful work for us. I do not want in any way to belittle it; I am not. However, it would be useful if we could just summarise it a little more at the moment. Thank you.

**Foo Chi Hsia:** We were asked for specificity. I will be happy to run through the last three areas. In fact, I have spoken about this already. The responsible development of resources in the Arctic is the third area that we are contributing to. In my answer to Lord Oxburgh about some of our economic interests, I spoke about that. The fourth area of contribution is the co-operation with Arctic-indigenous communities. Again, I spoke about that with quite a bit of specificity in my earlier answer.

The fifth area of contribution is to build public awareness of the Arctic. Again, we spoke about how the understanding of the Arctic should really go beyond the Arctic to the rest of the world, including in Asia. We have done our part in encouraging education and promoting interests in Arctic-related issues, not just among Singaporeans but among the more than
15 million visitors to Singapore annually. We have done a couple of joint activities with Norwegians, Canadians and others to launch exhibitions and run workshops to talk about Arctic issues in Singapore. There is a possibility of having the Arctic Circle Assembly—Lord Addington was there earlier—to bring one of the Arctic Circle fora to Singapore some time next year as well, working with the World Ocean Conference to do so. Thank you very much.

Q309 Lord Tugendhat: Obviously, the structures of the Japanese and Singaporean economies and the nature of their participation in international trade are at opposite ends of the spectrum and about as different as two countries could be, but that said, do you feel that Japan and Singapore have any common interests in the Arctic Council with other observer states? In particular, are there common interests with the United Kingdom and areas in which Japan and Singapore, separately or together, might be able to advance common interests with the United Kingdom?

The Chairman: I must ask if you can keep the answers fairly concise at this point, please, Ambassador.

Keiichi Hayashi: Like in many other issues, the UK and Japan have a lot in common, being island nations that are heavily dependent on trade and also very keen on global environmental issues. We share recognition of the challenges relating to the Arctic, so we consider the UK a very important partner among observer states. We are concerned with developing an international joint research exchange programme, which I have just mentioned, not only with the Arctic countries but with the United Kingdom. We just held a meeting of the UK-Japan Joint Committee on Science and Technology Co-operation. That was held on 4 November, where the possibilities of Japan-UK joint research on the Arctic were discussed. We also welcome the UK-Japan workshop on autonomous investigations of the Arctic’s response to changing climate, held from 18 to 19 November at the British Embassy in Tokyo. We would very much like to further promote co-operation with the UK.

Foo Chi Hsia: Thank you, my Lord Chairman. In terms of our interest with Japan, we have a longstanding collaboration with Japan on maritime issues, including in the Straits of Malacca and Singapore, and we continue to have several bilateral dialogues with Japan on how we could work on various maritime issues, including in the Arctic. In terms of the UK, I believe
that we have much to learn from observers with long-standing interests in the Arctic, like the UK, which has a long and distinguished history of Arctic exploration and research. We share a common interest in advancing the safe and sustainable development of the Arctic, and we pay particularly close attention to various aspects of development in the Arctic, whether that is the human, environmental or commercial dimensions. Both our countries, as well as Japan of course, are also committed and constructive players at international fora such as the IMO and international climate-change negotiations. All these common areas form strong grounds for possible collaborations, and we certainly think that there are many opportunities for us to learn from the UK as a leader in Arctic science and environmental research. Thank you.

**Lord Soley:** Very briefly, and maybe in writing, could you give us perhaps more guidance on whether and how both Singapore and Japan, both of which have very good reputations in scientific research, could work more closely with British institutions, both universities and others, on research and development? I get the feeling that both of you would be interested in doing that, but it may be something you could answer in writing.

**The Chairman:** Yes, that is a very good suggestion. Thank you, Lord Soley. Baroness Browning, our Japanese Ambassador has answered part of that question, but I am not sure we have given Singapore the area you are going to cover. Maybe we could give the High Commissioner a chance to answer.

**Q310 Baroness Browning:** There are 32 observer states, and they are a mixture. Some are nation states, some are NGOs. Given that there has been a little comment already by Mr Vincent Rigby about the number of observer states, do you feel that you could make a better contribution as an observer state if there were some quite big restructuring of the Arctic Council, the observers and the way in which the whole structure works at the moment? Would that allow you to make a greater contribution?

**The Chairman:** High Commissioner, would you like to start on this one? Again, I need to ask you to keep your comments fairly brief and write to us if there are other things you wish to add.

**Foo Chi Hsia:** Yes, sure. We are a very new observer of the Arctic Council. We do not think it is our position to suggest a major reform of the Arctic Council at this stage. However, we think there are other possible fora that have a bigger umbrella. For example, the Arctic Circle Assembly that has been held in Iceland for the last two years has the ability to
allow more players—whether observers, NGOs or industry—to be able to contribute to the overall discussion on developments in the Arctic and to learn from one another. There is also the Conference of Arctic Parliamentarians, in which we also participate by sending our parliamentarians. There are different structures and fora that allow all of us to learn from one another. To that extent we could contribute to greater knowledge and expertise, but at this stage we do not feel that we are in a position to suggest a reform of the Arctic Council.

Viscount Hanworth: Were you referencing the Arctic Circle in your response?

Foo Chi Hsia: I meant the Arctic Circle Assembly.

Baroness Browning: If there were a quite dramatic change, for example if there were a lot of countries and others applying to become observer states or if there were a significant change in the speed at which the seaway opened up and the ice melted, is there a danger that they would say, “Enough is enough. We have enough observers.”?

Foo Chi Hsia: I am not sure we are in a position to speak on their behalf.

Baroness Browning: Do you get that sense? I understand that a comment has been made that in backroom talks that has been the subject of discussion within the Council.

Keiichi Hayashi: If I may, we should not be talking about number games, but as a constructive suggestion we might say in days ahead that observer status is in fact given to very diverse actors such as state governments and governmental and non-governmental organisations. This might be making the role of observer a little obscure and there may be confusion because of that. It would be perhaps beneficial to consider, before the 20th anniversary of the council in 2016, reviewing the manner in which the council’s observer system is operated, with the characteristics of each type of actor taken into account.

The Chairman: Ambassador, thank you very much. Ambassador, perhaps I could ask you one very quick question. I noticed from our papers that Japan has appointed an ambassador to the Arctic since you have become an observer state. Is this something that serious observer states should do? Would it be good for the United Kingdom to follow suit?

Keiichi Hayashi: I am not making any suggestion, but we have appointed the Ambassador in Charge of Arctic Affairs and he has been participating in the senior officials’ meetings of the Arctic Council and so on. It is probably good practice to have some focal point of different government agencies. Obviously, the challenges related to the Arctic are very diverse and
they involve so many actors, governmental and non-governmental. It probably makes sense to have one single person to oversee that.

**The Chairman:** Thank you. That is most useful. High Commissioner and Ambassador, thank you very much indeed for your evidence. If there is anything else you wish to add, we are very keen to receive further written evidence, particularly in the areas that were pointed out on the way through by Lord Soley and me. Thank you very much indeed for your contribution. I bring this session to an end. I remind Members that we are still broadcasting, and we will start the next session in just a minute.
WEDNESDAY 9 JULY 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Lord Ashton of Hyde
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Moynihan
Lord Oxburgh
Baroness Symons of Vernham Dean
Lord Tugendhat

Examination of Witnesses

Jane Rumble, Head of Polar Regions Department, Foreign and Commonwealth Office, Henry Burgess, Deputy Head of Polar Regions Department, Foreign and Commonwealth Office, Martin Molloy, Senior Executive Officer, United Nations, OSCE and Arctic Policy, Ministry of Defence, and Debbie Brothers, Deputy Head of Bilateral Relations, NATO and Europe Policy, Ministry of Defence

Q1 The Chairman: I welcome you to the first evidence session of the Arctic Select Committee. I am very pleased to welcome members of the Foreign Office who are giving evidence today. We are being broadcast and a transcript is being made. I am sure you have a good idea of the sort of questions that will be asked. Before we start off, could you briefly introduce yourselves to the Committee and to anybody who is listening to the broadcast, in whichever order you wish to go?
Henry Burgess: My name is Henry Burgess. I am the deputy head of the polar regions department in the Foreign and Commonwealth Office.

Jane Rumble: I am Jane Rumble. I am head of the polar regions department in the Foreign Office.

Martin Molloy: I am Martin Molloy. I am the UN, OSCE and Arctic policy desk lead in the MoD.

Debbie Brothers: I am Debbie Brothers. I am the deputy head of bilateral relations, NATO and European policy team in the Ministry of Defence.

The Chairman: Can I just say one thing, which is probably obvious? We are not expecting all of you to answer all the questions. Those who relate particularly to those subjects can take part, although if someone wants to put in a particularly important point, please do so. I need to declare my own interest in that I am a non-executive director of the Marine Management Organization. Perhaps we could move on to the UK’s role in the Arctic. I would like to start by asking what role the United Kingdom is seeking to play in the Arctic and what the Foreign Office and the Ministry of Defence see as priorities for UK interests in the Arctic.

Jane Rumble: In terms of our interests in the Arctic, we published an Arctic policy framework in October last year, and this set out the broad interests that we have as the nearest neighbour to the Arctic region. Our main role is to promote our interests, which extend right across the spectrum from the security and safety of the Arctic region to the protection of the Arctic environment, to the commercial interests that the Arctic offers, of which there are several. The UK is particularly interested in terms of energy security, shipping, access and tourism. We also have a role in supporting the Arctic states in their stewardship of the Arctic.
The Chairman: Perhaps I could follow up one area. The Foreign Office has quite a strong mission in terms of human rights. Does the UK have a view about indigenous peoples in the Arctic, in terms of its broader human rights policy?

Jane Rumble: The Arctic Council is made up of the eight Arctic states. It has six bodies that represent the indigenous peoples, and so our role as a state observer is to very much support the right of the indigenous peoples to have their voices heard in that forum, and not to do anything that would diminish the status of the permanent participants.

The Chairman: What are the MoD’s interests in the polar regions?

Debbie Brothers: I suppose it really falls out of the expedition. We want to maintain security and stability in the region; the bilateral security relationships we have, particularly with NATO partners who are in the Arctic Council, are also very important to us. Freedom of navigation is of interest to the Ministry of Defence as they are to anybody who has ships. It is a fairly straightforward aspiration.

The Chairman: Just give me an idea of where it is in priorities. I am pleased to see that clearly it has its own desk officer or head of arctic policy. Where does it fit in the broader context of British foreign policy? Is it on the rise or the decline?

Jane Rumble: I would say it is probably on the rise, mainly because of the increasing interest in the Arctic region. The Arctic Council itself is a relatively young body—it was only formed in 1996—and the rapid changes in the Arctic have prompted a rise in interest. You will know that the Arctic sea ice is retreating at a considerable rate—faster than originally predicted—which is causing rapid change in the region. For that reason, I think it is on the increase; there is certainly a broader interest in the Arctic than there was 10 years ago, for example.
The Chairman: As a last question on that point, do we ever have ministerial visits to the Arctic Council or Arctic Council meetings as part of our observer status, or is it purely officials?

Jane Rumble: It is mainly officials, because of the role that the UK plays as a state observer. We are not sitting front and centre in the decision-making forum, so to have a Minister sit at the back while Ministers of the Arctic states speak would not be the best use of time. But Ministers are focused on the issue. Our Minister has spoken at Arctic events recently in the UK; he also raises the issue of the Arctic bilaterally when he meets various Ministers of the Arctic states or others with an Arctic interest. It is an active area of the ministerial profile. The Arctic Council itself and Ministers of the Arctic states meet every other year for the end of the respective chairmanship, which lasts two years, but Ministers from non-Arctic states do not attend.

The Chairman: Could you just tell us, for the record, who the Minister is?

Jane Rumble: Yes, it is Mark Simmonds, for the Foreign Office.

Q2 Lord Addington: Why have the Government chosen to have an Arctic policy framework rather than a strategy? How did you devise it and what is its effect on those Arctic states? Secondly, what has been the response to the publication, both domestically and internationally?

Jane Rumble: The UK Arctic policy has been developing over the past decade, particularly following the publication of the Arctic climate impact assessment, which gave the Arctic a greater focus because of the description of all the climatic changes. Each of the Arctic states has also been developing its broader interests across the Arctic. They were developing Arctic strategies from around 2008—so the articulation of an Arctic strategy by the Arctic states
themselves has been quite recent. Each of the Arctic states has produced an Arctic strategy. For the UK, we wanted to articulate our Arctic interests. Some of the Arctic states felt that a “strategy” is connected to something over which you have direct control and has objectives and deliverables, and felt that it might be going a bit far for a non-Arctic state to suggest that it was in control of various elements of Arctic policy. Some of the other Arctic states were not quite so sensitive, but to walk that particular tightrope, we decided not to call it a strategy but to set out our Arctic policy interests in a framework, so that we could be clear what the UK’s main interests were. I am sorry, I have forgotten the second part of the question.

**Lord Addington:** What has the response been to the publication, both here and aboard?

**Jane Rumble:** As we understand it, each of the Arctic states welcomed the policy framework as a clear and transparent articulation of the UK’s interests across the board. We have certainly had very explicit good feedback from some of the Arctic states. Norway and Denmark in particular have recently commented to our Minister that they very much welcome the publication of the Arctic policy framework.

**Lord Addington:** One supplementary question comes to mind immediately. Which states are you referring to, and why do you think they are being that sensitive about this use of language? It would be quite helpful to hear that.

**Jane Rumble:** I suppose the different interests come from the different states’ position in the Arctic. The largest countries in the Arctic, with the broadest interest, Russia and Canada, have very broad Arctic policies because it is a large part of their entire territory. They were possibly the most interested in ensuring that the Arctic states had a very clear remit
compared to the other Arctic states. There was then a difference in terms of the northern
European engagement with the UK, as a European partner.

Lord Addington: So it is straightforwardly a case of, “It is our backyard, or most of it, so
please be very polite when you are stepping in it”?

Jane Rumble: Yes, although I probably would not put it quite like that.

The Chairman: What about domestically? There are NGOs that have an interest and there
are quite strong campaigners in this country on polar issues, the Arctic, climate change and
all those sorts of things. There is also British industry. Was there any reaction from those UK
stakeholders across that broad spectrum?

Jane Rumble: Yes. When we were drafting the policy framework, we had various meetings,
including with the Arctic states’ representation in London, as well as with some of the larger
UK commercial operators in the Arctic and the NGOs. In fact we had one discussion involving
both those players at the same time, to try to tease out some of the difference of views.
There are different perspectives across the NGO spectrum, I think. You will probably hear
directly from them, but there are some that are quite pragmatic in terms of wanting to
engage with industry to ensure higher standards and best practice, while others feel that
certain activities should not take place in the Arctic region, such as hydrocarbon drilling.
There are views across the spectrum. There are also different views within the hydrocarbons
industry: one company said it would not look at the Arctic at this time, while other
companies are looking at it.

Lord Addington: You talked about Russia and Canada. Is it becoming apparent that there is a
co-ordinated approach on this between the two of them or is it just two versions of the same
thing? Is there quite clearly a conversation and a co-ordinated approach?
Jane Rumble: I think you would have to ask them that. I do not see it. Within the Arctic Council, there is a lively debate, as you would expect in any multilateral forum in which different views are expressed. Collectively, they have welcomed the state observers, the Arctic policy framework and the UK’s interest.

Q3 Viscount Hanworth: I would ask one of the witnesses to clarify the UK’s observer status in the Arctic Council. Is that an ad hoc status that requires an invitation at each meeting, as I believe is the case for the European Union, or does it have a greater permanency? Beyond that, do Her Majesty’s Government believe that the Arctic Council represents an appropriate forum in which to promote the interests of the UK? Finally, do you believe that the Arctic Council will be capable of playing a satisfactory role in future in the governance of the Arctic region?

Jane Rumble: Yes. In terms of the status, all of the states which are state observers to the Arctic Council are full state observers. The EU is the only—

Viscount Hanworth: Ad hoc?

Jane Rumble: Yes. It is the only regional collection of states that has that ad hoc status at this time. I think it is an appropriate forum, where the issue is relevant to the work of the Arctic Council. At the moment, the Arctic Council does not necessarily cover, or have on its agenda, everything that we might be interested in. For example, it does not look at fishing, although it might in the future; it does not look at whaling, although it might in the future; and it does not look at security, as there are separate forums for that. Where it is addressing an issue that is of interest to us, it is an appropriate forum. It is the regional body, and we support it as the organisation looking at co-operation, but it does not cover everything that we have interests in. For example, the polar shipping code is being discussed within the International
Maritime Organization, although the Arctic Council might then have additional issues to discuss in respect of shipping. The UK is active in different forums that have an Arctic element to them. In terms of it being satisfactory into the future, all the evidence is that it is growing in its influence and ambition and that it is beginning to agree binding treaties. I think it looks like it should be, at least.

**Viscount Hanworth:** On another tack, might I ask whether Her Majesty’s Government are fully satisfied with and supportive of the provisions of UNCLOS—the United Nations Convention on the Law of the Sea? Might they not feel that the convention accords excessive territorial rights to certain Arctic nations? As a rider, are you willing and prepared to comment on the seeming unwillingness of the United States to ratify the convention?

**The Chairman:** Could we come back to that as a supplementary? I will bring you in again on the fifth question, which I think Baroness Symons wants to ask. Perhaps we could bring it in there as a supplementary to that and I could come back to you.

**Lord Hannay of Chiswick:** I wanted to ask a supplementary to the question that you have just replied to. Let us assume that the Arctic Council moves towards reaching some legally binding rules among its own members on a particular sectoral issue, and that we have interests that are affected by that. Perhaps we do not like the detailed way in which it is proposing to deal with it. How do we set about handling that, given that we have no decision-making rights? As far as I can see, we do not even have the right to speak at meetings of the council. Perhaps you could explain how we would set about doing it, other than by lobbying in the Arctic Council capitals, which goes without saying.

**The Chairman:** I am sorry but I think that also really comes in on the fifth question about governance structures. Rather than wandering through it, perhaps Lord Hannay I could bring
you in on the defence side and then come back to both of you in terms of supplementaries in the governance area. Perhaps that would be the best way to do it.

**Lord Oxburgh:** Could I ask a quick one? In your experience, does the Arctic Council frequently take votes?

**Jane Rumble:** No, it is a consensus body so the articulation of the positions makes it clear whether consensus has been reached or not.

**The Chairman:** I promise members of the Committee that we will come back to governance in a minute. Lord Tugendhat.

**Lord Tugendhat:** With your experience of international organisations, does the level of representation at the Arctic Council vary significantly between countries? Do some countries send more important people and some less important people? On that basis, which countries would appear to attach the most importance to it?

**Jane Rumble:** I do not think I know enough about the grade structures in each of the foreign ministries to answer that exactly, but will say that each of the Arctic states takes it very seriously. The Foreign Ministers of those Arctic states are the formal members of the Arctic Council and each of the Arctic states has nominated a senior official, all of whom, I would say, are at ambassador level. I do not know exactly whether there are subtle differences but there is certainly no question but that they are able to speak their mind. There is nothing obvious within the forum that indicates that one country is just in listening mode and others are all actively engaged; they are all actively involved.

**The Chairman:** We are going to come on to how the Arctic Council is governed, when we can perhaps have a number of supplementaries and discuss that in greater detail. Perhaps we should move on to security and defence for the mean time.
Q4 Lord Hannay of Chiswick: As this is my first statement, I declare my interests as a member of the advisory board for the Centre for European Reform, a member of the Forum for the Future of Europe and a member of the council of the University of Kent. First, the Arctic policy framework, which the Foreign Office sponsored, states when considering stability in the region that “the role of NATO will remain central”. What does that actually mean? What role do the Government see NATO, the European Union’s common security and defence policy or, indeed, our own Armed Forces having in the region? To what extent is that view shared by at least the NATO members—presumably not the Russians—of the Arctic Council? The second question is quite different and not to do with NATO. Could you explain to us what relevance, if any, the fact that all the members of the Arctic Council are members of the Organization for Security and Co-operation in Europe has to their dealings with each other? Indeed, what relevance does the Paris charter, which has been signed by all those countries including all the other members of the OSCE, have? It deals with many issues such as minorities and respect for territorial integrity, sovereignty and so on. Perhaps you could answer both the NATO and the OSCE points.

Jane Rumble: I should just start by saying that the Arctic policy framework is a cross-government document, cleared across all of HMG not just the FCO. You asked about NATO and the OSCE, and I will invite the MoD to take that one.

Debbie Brothers: I am happy to take NATO but I am afraid I cannot really respond on the OSCE, because we have not got the expertise here today.

The Chairman: Sorry, my hearing is not brilliant.

Debbie Brothers: I was saying that I am happy to pick the NATO point up but OSCE probably needs to be taken back to the FCO policy leads on the OSCE to answer.
Lord Hannay of Chiswick: I thought the OSCE was included in the titles that you gave earlier.

Debbie Brothers: The MoD supports the policy but we do not own it. The ambassador to the OSCE is a Foreign Office official, so the FCO drives the policy there, although we are deliverers of that policy when appropriate, if that makes sense. Is that right Martin?

Martin Molloy: Yes.

Debbie Brothers: Thank you. I just had to check with the OSCE expert in the MoD. NATO really is central for our relationship with those members of the Arctic Council that are also in NATO and on the Arctic Security Forces Roundtable—which are the United States, Canada, Iceland, Norway and Denmark, with the latter of course including Greenland, which is part of that country. For the UK, NATO remains the primary route through which we talk about security and defence relationships with these states. I know that within the Arctic Council views are split about the role that NATO should have in terms of involvement with the council. Within NATO itself, there is not necessarily a common view about its roles in the Arctic. You might find it helpful to know that, back in May last year, the Secretary-General did state that NATO has no intention at this time of raising its presence and activities in the “high north”, for which you can effectively read the Arctic. In terms of the MoD’s role, we see the role of our forces as supporting capability development and maintenance. We do this through cold-weather training for our Armed Forces in Norway and engaging in Norwegian-led Arctic-based NATO exercises.

Lord Hannay of Chiswick: Did you want to complete the answer?

Jane Rumble: I was just going to comment on the OSCE point, having had it batted back. I am not the expert on this, but as we understand it, the OSCE looks at peace and stability in the parts of Europe that might need it. So I think our general view would be that to request its
engagement in the Arctic might be perceived as suggesting that there might be an area of tension—which there is not. Equally, it has a very broad membership, so the Arctic states would again be a bit concerned about having that much broader involvement in some of the issues that the Arctic Council is itself working on. It would be potentially duplicative, but the main perception would be that it suggested there was some kind of tension when there was not.

**Lord Hannay of Chiswick:** I was not suggesting that there was any tension at all. I was merely asking you to explain the relevance of the OSCE, which all members of the Arctic Council are members of, and the relevance of its charter, which relates to many issues which come up in the Arctic Council, such as minorities—or indigenous peoples in the Arctic context—respect for territorial integrity and sovereignty, and so on. What relevance does that have to the Arctic Council? I think I interpret your answer as saying that none of you has ever thought about it.

**Jane Rumble:** It is probably fair to say that it is not something that we have looked at, because the OSCE would have to agree collectively that it wanted to look at the Arctic. I cannot imagine—

**Lord Hannay of Chiswick:** But it is part of the territorial area of the OSCE, is it not? These countries we are talking about are members of it.

**Jane Rumble:** Yes, but it does not mean—

**Lord Hannay of Chiswick:** They do not have to agree anything.

**Jane Rumble:** But that does not necessarily mean that they want to have a focus in that region.
Lord Hannay of Chiswick: I was not talking about focus, frankly, I just asked what the relevance of it was—which appears to be zero.

Jane Rumble: Yes.

Martin Molloy: Trying to get to the nub of your point, all the nations of the Arctic Council abide by their OSCE obligations, and that includes in the Arctic area as well. However, the OSCE agreement and the Arctic remit are kept quite separate in their dealings. So, although they all maintain their security and reporting obligations under the OSCE, it does not seem to impact greatly on the work of the Arctic Council, apart from the fact that they all maintain that level or standard.

Lord Hannay of Chiswick: Thank you, I think I understand that. What you are saying is that there is a potential involvement there, but it is not a practical one at the moment because there are not the sort of issues that would bring the OSCE into action in the way it has been in eastern Ukraine. But potentially, there are a set of binding obligations on all the members of the Arctic Council.

Debbie Brothers: Yes.

Martin Molloy: Yes.

Jane Rumble: Yes.

Lord Hannay of Chiswick: Thank you very much. Could you just say, on the NATO point, that the NATO secretariat and the NATO Secretary-General therefore have no contact at all with the Arctic Council—they are not represented as observers, they are not consulted?

Jane Rumble: No. Not all the members of the Arctic Council are in NATO.

Lord Hannay of Chiswick: Not all members of the Arctic Council are in the EU, but the EU plays a role.
Q5 Baroness Symons of Vernham Dean: I should declare a pretty tentative interest as I am a consultant to CCC, which has interests in oil and gas in the Middle East region. It has no interests in the Arctic region. The clerks put round a very interesting piece from the *Alaska Dispatch*, which says that, at the beginning of this month, “Canada surprised the Arctic Council by replacing its chair”, halfway through the chairman’s tenure. The chairman who Canada has just put into the Arctic Council has a very strong military background, specialising particularly in Afghanistan, as luck would have it. Clearly, the *Alaska Dispatch* thinks that it is significant to have put in a military man halfway through his predecessor’s tenure. Have you read anything into this? Are the Canadians thinking, “Actually, we really do need somebody with a stronger defence background chairing the council”?

Jane Rumble: No, we have not seen anything explicitly. You would need to ask Canada if there was any reason for this. As far as we are aware, the role of the chair of the senior Arctic officials has not changed at all—the job description is the same, as is the role and function. I do not know why they changed their official.

Baroness Symons of Vernham Dean: Do you not think it might be quite a good idea to ask? We are there as observers, because we have interests and are acknowledged as having interests. It does seem to have caused a bit of a interest locally in the Arctic region. To change a chairman halfway through a tenure is a pretty significant thing to do, particularly when you are seemingly putting in someone with a very different background. I just wonder whether that is not something worth raising.

Jane Rumble: We will raise it. It is quite a recent occurrence.

Baroness Symons of Vernham Dean: Absolutely.
Jane Rumble: The churn of diplomatic posts does not necessarily mean anything, but we will be checking that, yes.

The Chairman: Viscount Hanworth, do you want to pursue the area about the Arctic Council itself? A number of people have supplementaries on that but we will get on to other broader governance issues in the next question.

Baroness Symons of Vernham Dean: That was defence related.

Q6 Viscount Hanworth: I wanted to ask a question about UNCLOS, the United Nations Convention on the Law of the Sea. In particular, are Her Majesty’s Government fully satisfied with, and supportive of, the provisions of the convention or might they not feel that the treaty accords excessive territorial rights to certain Arctic nations? As a rider to that question, are you prepared to comment on the seeming unwillingness of the United States to ratify UNCLOS?

Jane Rumble: The UK is a full member of UNCLOS and abides by its provisions and within its framework.

Viscount Hanworth: With enthusiasm?

Jane Rumble: Yes. The US has stated that it would like to and intends to ratify UNCLOS. It views UNCLOS to be what it terms customary international law, which means that the US does abide by its provisions. As for the Arctic, each of the Arctic coastal states signed an agreement in Greenland a few years ago, called the Ilulissat declaration, in which they all committed to abide by the rules of UNCLOS in respect of Arctic governance, including the US. So they are politically committed to operating within the UNCLOS framework.

Viscount Hanworth: You have no sense that the framework accords excessive territorial rights to certain nations?
Jane Rumble: Not territorial rights. There are some disagreements over the interpretation of the rights under UNCLOS—for example, as you will no doubt be aware, about whether the Northwest Passage forms an international strait or territorial waters. But that is an interpretation of the provisions of UNCLOS rather than a question about whether UNCLOS itself gives an unlevel playing field to those sorts of issues.

Viscount Hanworth: If not territorial rights, are rights to mineral extraction a contentious issue?

Jane Rumble: No, there is full agreement globally. If you can demonstrate that you have an extended continental shelf under UNCLOS, then you have rights over the seabed there. How big your continental shelf happens to be is a fact of geology. The Arctic continental shelf is yet to be delimited by the UN Commission on the Limits of the Continental Shelf, and the different Arctic states are putting in their proposals. Russia has put its proposals in and was asked to submit more information. That is all under consideration but it will be a fact of geography whether they have an extended continental shelf or not.

Viscount Hanworth: Everybody is prepared to accept the consequences of that?

Jane Rumble: Yes. There is a two-stage process. The UN will preside over the agreement as to where the outer limits of the continental shelf are and, if it is not clear who is the coastal state, there will then be separate negotiations between states with interests as to who is actually sovereign over those bits of continental shelf. That would be a separate—bilateral, trilateral or whatever—debate.

Viscount Hanworth: So it is not merely hydrography—a political process will ensue afterwards.
Jane Rumble: Yes, the geography is about whether the continental shelf exists or not. If you have two neighbouring states, they still have to agree their boundary and who would be sovereign over which bit.

The Chairman: Can I just ask when how long you think this process—the territorial negotiations and decisions—is likely to take?

Jane Rumble: It can take a long time. It depends on what the drivers are for coming to a resolution. The Norwegians and the Russians recently agreed their delimited maritime boundary in the Barents Sea. They were negotiating for a long time, but as more information came out about the potential resource interest in that region, there was more of an impetus to make greater progress on it. There are boundaries that still need to be agreed between some of the other states, such as between Canada and America, but that is not in an area which anybody is necessarily that interested in at this stage, so they have not prioritised those negotiations. It can vary depending on what the drivers are for getting agreement.

Lord Hannay of Chiswick: Do we think that the Russians planting a flag on the North Pole—under the water, if I understand it correctly—was consistent with the UN Convention on the Law of the Sea?

Jane Rumble: I would suggest that the planting of the flag on the North Pole was a spectacular piece of PR—it did not have any legal status. Doing it or not doing was not an illegal act; nor was it an act that has any bearing in law whatsoever. It was simply symbolic, and a suggestion by Russia that it has interests in the North Pole.

Lord Hannay of Chiswick: That is the view of the Russians, too?
Jane Rumble: Yes, Russia accepts that. They did not put the flag on the North Pole and then exert claims over it except through the normal UNCLOS way, in which they are suggesting that their continental shelf extends to the North Pole.

The Chairman: Earlier on, Lord Hannay, you wanted to ask a question about what would happen if the Arctic Council agreed something and we disagreed with it.

Lord Hannay of Chiswick: If this is the appropriate moment.

The Chairman: Yes, I think this is the appropriate moment to do that.

Q7 Lord Hannay of Chiswick: Going back to an area we were on before, I wanted to ask you a question about when the Arctic Council is moving towards making an agreement. I take it that it reaches agreement by consensus because it requires unanimity to take decisions. If it is moving towards doing something about a subject or a sectoral issue that we are interested in, and we thought that the direction in which it was proposing to go and establish law—which would apply to us—was against our interest or not exactly as we would want it, what recourse do we have, given that we apparently cannot speak at the Arctic Council and are not part of the decision-making process, other than the normal bilateral contacts in capitals, which of course we would have even if we were not an observer at the Arctic Council?

Jane Rumble: Since we are back on the Arctic Council, I just wanted to clarify the discussion that we had about the Canadian chair of the senior Arctic officials. The Canadian chair of the Arctic Council itself remains their Minister, Minister Aglukkaq: it is the chair of the senior Arctic officials who has changed. On the question, the UK’s relationship with the Arctic states is pretty strong and multilayered. When it comes to discussions that they might have about binding agreements, you say that all we can do is maybe discuss things in post, but that is actually quite powerful. I know the senior Arctic official for Norway very well, and my
opposite number in Washington, and they have been extremely generous and open in discussing the sort of agreements that they are making. They are very keen for it not to prejudice their relationship with other states. They do not have any interest in closing the door to some of these things. They have been very clear, for example, that they would not want to see the discussions on enhancing scientific co-operation as a closed Arctic shop. They know that scientific excellence comes from having a much broader range of countries, so they have a similar remit in mind. Engaging bilaterally before the issues go into negotiations is quite a powerful tool to have. It is the same anywhere in the world: if a collection of states decide they want to get together to agree something and exclude other states, that is the same challenge. The only thing that we can do is to try to influence the states in question and make our case, which we can do multilaterally. It is not that we cannot speak at the Arctic Council—it is not particularly welcome sometimes, if there is a very busy agenda, but if we had something that we particularly needed to get across, we would be able to raise our flag at the council.

**Lord Hannay of Chiswick:** You would?

**Jane Rumble:** Yes, we have spoken at the Arctic Council on some occasions. It is just that they do not want to go through every single state observer. That is understandable—if all 12 of them spoke for 10 minutes it would take a long time—but if there is something very pertinent, you can indicate to the chair that you wish to comment, and there has never been an occasion when they have said, “No, you cannot make that point”.

**Lord Oxburgh:** I want to go back to shelf and area jurisdiction, which we were on a moment ago, and ask a slightly technical question. The impression I get, which may be quite wrong, is that the extended Russian claims depend on interpreting the relatively shallower water over
the Lomonosov Ridge as forming part of their shelf. Physiologically, in terms of topography, they might just have a case, but of course geologically it is quite different. Has anyone taken a view on this?

**Jane Rumble:** That is exactly what the UN Commission on the Limits of the Continental Shelf is looking at. It has built up a certain level of case history. For example, in the UK, it has agreed an extended continental shelf in the south-west approaches towards Cornwall. As I understand it, we did not get agreement for a proposal for an extended continental shelf around Ascension Island. It is going through the process of identifying in order to apply it consistently across the globe. I do not know the answer to your question, because it has not yet been decided.

**Lord Oxburgh:** But that is presumably the basis of the Russian claim.

**Jane Rumble:** Yes.

**The Chairman:** On the particular question of how it operates at the moment, there has been quite an influx recently of other observers, particularly from Asia. I am interested in the dynamics of that. Do the observers get together? Is there an observer caucus—an Asian observer caucus or a European observer caucus? How does the politics work, or does everybody play it straight as individual observer nation-states?

**Jane Rumble:** It is evolving. When the Arctic Council was first set up in 1996, there were five state observers, which were all European states. There was a caucus of those state observers. Then Spain joined and there were six. On a couple of occasions, the state observers agreed a statement that we read out to the council, but that was when we were all European states and had every similar interests. Now, the diversity of the state observers is such that it is not necessarily the case that our greatest interests as the UK lie with all of
those different state observers—our interests are actually very closely aligned to the European countries that are Arctic Council members. Equally, we have very good links with Canada and America, as well as some interests in line with Russia. The dynamics of getting all 12 together are complex, so it is not really a formal forum. There have been a few ad hoc meetings with the state observers—Poland co-ordinated a meeting a few years ago, and the then senior Arctic official chair from Sweden came to the discussion, but it is not a formal body. We would be cautious about being seen as a sort of group of state observers, because then you have 12 state observers and the eight Arctic states. It is not a “them and us” dynamic and we would not want it to be perceived as such.

Q8 Baroness Symons of Vernham Dean: The Arctic Council was set up in 1996, which is 18 years ago now. We have talked about the changes there have been in the observer states, but I wonder whether the Arctic Council is able, in its current form, to deal with the sorts of changes that we have seen since 1996. A very interesting WEF paper circulated to the Select Committee makes the point that economic pressures have really come forward in the past few years. There is also the issue of natural resources and the growing viability of seasonal shipping. Then there are the whole range of issues about collaborative activity in relation to investment in the region and the need for better science in the region. What is your assessment? We have talked about the changes, but have they led to sufficient flexibility to deal with the real change on the ground in environmental issues, the growing mineral wealth and the sorts of growing interests that everybody has in part of the world that is said to have a quarter of the world’s minerals in its territory?

Jane Rumble: I should say that the Arctic Council was established by ministerial declaration of the eight Arctic states to co-operate and collaborate where there is mutual interest. For
some of the issues you are talking about, there will be potentially different challenges, depending on which Arctic country you are talking about. There could be very different challenges for northern Canada—most of the multiyear ice that is left tends to be on the Canadian border rather than in Norway, where the consequences of global warming are such that Norway is becoming increasingly ice-free. You now have to go north of Svalbard as a tourist to find the ice and the polar bears. There are different challenges that countries might look at on a state basis. They are all developed independent states with their own jurisdictions, their own rights over their minerals and their own decision-making about how they wish to develop the Arctic. The Arctic Council looks at the issues on which they all have a collective interest and on which they want to co-operate. The Arctic Council may not be the right forum to look at individual investment in individual mining projects, as that would just be a decision for the state.

Baroness Symons of Vernham Dean: What about the waterways in particular? That is obviously an area where there will be a lot of interest in rights to different waterways. There is a China News piece about the Chinese setting off in two days’ time with really an extraordinary expedition—65 scientists have all gone off and are spending 76 days there. Does that raise questions about use of the waterways? Are our Government happy with how the access to waterways is working at the moment?

Jane Rumble: Again, the Arctic Council is this collection of states looking at areas of interest. There are many other international agreements that have an Arctic component, which sit above that, if you like, as they are legally binding treaties. UNCLOS, which we have mentioned, is the international agreement that would govern the rights to shipping and waterways et cetera. In that respect, it is very clear that each of the Arctic states has
jurisdiction over its territorial sea, its exclusive economic zone and potentially its seabed under UNCLOS. The UK role would be through UNCLOS and the International Maritime Organization, where we are a full player, to look at the Arctic in the same way that you would look at any other region of the world. There is not an obvious concern about it at this stage.

The Chairman: You mentioned the international aspect. We are obviously aware of UNCLOS and of the IMO as an organisation, but what others are there? What else is on the list? I do not think we have ever asked or thought about that.

Jane Rumble: This will not be a completely full list, but the ones that we particularly look at would be UNCLOS and the International Maritime Organization. Then, in respect of the UN, you would look at the establishment of regional fisheries management organisations, were there to be one for the Arctic—there is one for the Pacific, one for the north-east Atlantic and one for the north Atlantic, so they are bordering up on to the Arctic. The UN Framework Convention on Climate Change obviously has a significant Arctic focus and interest. There is the Stockholm Convention on Persistent Organic Pollutants—the Arctic is a sink for pollutants, so there is a big issue, and that has been a particularly significant treaty in looking at pollutants in the Arctic. There is the Convention on Biological Diversity, the Whaling Commission—

The Chairman: I apologise, I am putting you on the spot and making you go through a list. Perhaps it would be useful if you could provide a list from the FCO of the international agreements that are particularly pertinent to the Arctic.

Jane Rumble: We will do that, yes.

Lord Oxburgh: A summary of what they cover.
The Chairman: That would be extremely useful: a summary of what they deal with, if it is not obvious from the title.

Baroness Symons of Vernham Dean: Including the signatories.

Jane Rumble: Okay.

The Chairman: Thank you. That would be most useful.

Q9 Baroness Browning: I should declare that I am a member of the Advisory Committee on Business Appointments. Could I ask you about the EU and its effectiveness? We are rather assuming that some of the difficulties the EU has had in its applications to the Arctic Council, and its current ad hoc observer status, are down to one EU regulation, 1007/2009, which relates to seal products. How damaging is that? Has the EU made any attempt to lobby on this regulation? In other words, does it recognise that there might be movement one way if it was to move another way on this regulation? Are any of the other documents that it has issued, particularly some of the policy documents it has issued in respect of the Arctic Circle, matters of concern, or does the Arctic Council accept what the EU has said on policy?

Jane Rumble: I will take that the other way round. The EU has articulated its policy on its interest in the Arctic in a number of Council conclusions over recent years. It has matured those positions in broad consultation with the Arctic states so that they are now, we get the general impression, not of great concern to the Arctic states. They are very much in line with the UK’s policy, so they have highlighted some of the issues which we highlighted in our Arctic policy framework.

The issue that caused some consternation in terms of the EU’s status on the Arctic Council is, as you mentioned, the seal trade issue. The EU perspective is fairly clear that the regulation provides for indigenous peoples to trade seal products; the regulation states that an
indigenous seal harvesting practice can have an exemption from the regulation. You can have a certificate and then trade within the EU. Indigenous peoples in various bits of Greenland and Sweden have signed up to this. It is Canada’s view that the broad prohibition on sealing products and trade in them has a knock-on effect on the markets that indigenous peoples might be able to trade into, so the fact that it prohibits commercial sealing is damaging their indigenous trade. They have not therefore sought the exemptions that you would be able to get under the EU seal regulation. That is the position they are in. There has been a case at the WTO looking at this, whose outcome Canada is still considering. The EU feels that it has stated the case, and has invited Canada to apply; Canada feels that it still has concerns about the regulations, so it is ongoing.

Baroness Browning: Has it been really damaging to Canada and Greenland?

Jane Rumble: You would have to ask Canada for their assessment of that. They say that it has been damaging.

Baroness Browning: What about the UK’s position? Do the UK Government support the EU having full observer status? We are actually signatories, are we not, to this regulation that is causing all the problems?

Jane Rumble: We are, yes. This is a Defra policy area, if you want the detail on sealing, but as I understand it, there is no appetite in the UK to go back to a commercial seal trade. There is no market, as far as we can see, as people do not want to buy seal products derived from commercial hunting and exploitation. We support the EU’s observer status: the Council conclusions that the EU should seek observer status on the Arctic Council were agreed. There are many areas in which it could be very beneficial to engage with the Arctic Council, so it
has this ad hoc observer status. This issue with Canada is obviously very political, and Canada wanted to make a very public statement about it.

**The Chairman:** Does the fact that there has recently been a fairly big trade agreement between Canada and the EU not help move this agenda forward?

**Jane Rumble:** I would think so. I am not the expert on sealing or trade, or on the agreement between the EU and Canada, but yes, there is quite a lot of optimism in the EU and within the other Arctic Council states that this issue can be resolved.

**Q10 Lord Tugendhat:** How is UK policy towards the Arctic co-ordinated across various government departments that have an interest in it? Would you judge that the salience of Arctic issues has risen significantly in the past three to five years and where does it stand now? I am struck by the fact that Mark Simmonds is responsible for Africa, for many of the UK’s overseas territories and for the Caribbean, too, I think. It does not seem to be a natural fit to have the Arctic—it looks a bit of an add-on and would suggest that the Arctic does not, as yet, loom very large in your salience list, as it were.

**Henry Burgess:** I will take that one. The Foreign Office co-ordinates discussions with the various departments on a bilateral basis as we need to, for example with DECC or Defra if it is an environment or energy issue. We also chair a cross-Whitehall Arctic network, which meets with representatives from other government departments such as DECC, Defra, Business, Innovation and Skills, the MoD, the Department for Transport, the Maritime and Coastguard Agency—I could go on. That usually meets twice a year, and last met during the process of agreeing the Arctic policy framework, which itself was formally agreed by a Cabinet Committee through the usual processes. We will be hosting another meeting of that group relatively shortly. There is very good co-ordination and working between the Foreign Office
and the other departments. You also mentioned Ministers. Mark Simmonds is the Polar Regions Minister. It is true that he has a large portfolio, but that also includes issues such as climate change and energy security policy, and there is a natural fit there between his responsibilities for the Arctic and those other issues. He is also the Minister, as you said, for the overseas territories, or at least for many of them, which include the British Antarctic Territory—there is a natural fit there between the southern hemisphere and the north.

**Lord Tugendhat:** On my point about salience, do you think that Arctic issues have a greater salience than perhaps they did three to five years ago?

**Henry Burgess:** They have certainly not got a lower profile. I would not want to give the impression that the Arctic was not important to the UK five years ago but I think you can tell from the number of conferences that Ministers appear at, their statements on these issues and the amount of interest that there is generally in these issues that there is a sensitivity to Arctic issues within the system, which was perhaps not quite as obvious shortly before that.

**Lord Addington:** As you were talking there, I was just wondering about the areas in which you have found other government departments coming into your daily practice and influencing what is going on, possibly with the exception of the Ministry of Defence. Is there an example of how things have changed with something coming across? We politicians will all tell you stories about cross-government working not happening—indeed, it is probably the one story that all Members of both Houses of Parliament can tell. Do you have a good example of where one of the other departments has come in and changed your working practices?

**Henry Burgess:** One good example is probably the discussions that we have been having with the Maritime and Coastguard Agency on the polar code being produced by the International
Foreign and Commonwealth Office and Ministry of Defence (Officials) – Oral evidence (QQ 1 – 15)

Maritime Organization. We have taken very close advice from the Maritime and Coastguard Agency about how the polar code should apply to UK shipping and what the priorities should be. That is an area where the Maritime and Coastguard Agency lead the discussions; but the close working means that the policy from the FCO side in terms of a strategic approach marries with the maritime policy on the technical side. That has been a successful way for both parties to work together.

**Lord Addington:** Would this be a model that you are quite happy with? Have there been major complaints about this? This is an interesting point about what actually happens here. What tends to happen from our perspective is that you ask any department—not yours particularly—a question and a look of panic comes across the face of the Minister or official. You then get an answer coming back that is usually dripping with ignorance of the subject. I wondered what your process is. Running down the list of people you are responding to in various ways, there are clearly going to be problems here. I wondered whether you had a more formalised process or whether you gather in.

**Jane Rumble:** Shall I take that? Yes, it would be fair to say that it is challenging. The Arctic, if you take the ice away, is like any other region of the world. The ice makes it more challenging in some ways because it is changing so rapidly, but the issues that the Arctic faces are very similar in some ways to the issues that face other areas. So it can be incredibly broad, and you can ask us about anything—indeed, the questions you have given us have been incredibly broad. It is a challenge to make sure that we have a broad overview of the different issues. Our role is quite a lot about facilitating, so what we do through the cross-government network and through the Arctic meetings that we have in government is precisely to try to tease out some of those areas where there may be a perceived
Foreign and Commonwealth Office and Ministry of Defence (Officials) – Oral evidence (QQ 1 – 15)

inconsistency. A lot of stakeholders and NGOs tell us that there are perceived areas of inconsistency in government policy, which is why we have been trying to get different players together. You are right that having different departments responsible for different things makes life challenging, but it would not really make sense to take Arctic shipping out from the expertise around global shipping. The Arctic is so broadly connected to global policy that it is just one element of many different policies that we need to try to bring together.

**Lord Addington:** So, often, it is a case of you feeding into them rather than them feeding into you.

**Jane Rumble:** It depends on the issue. Increasingly it can change.

**Lord Addington:** Will general shipping now be tough enough to handle ice? Should it be a general requirement if you are going to go further north and it is going to come into our waters as opposed to saying, “Oh what do we do about sending a ship north?” Should it be a normal requirement sort of thing?

**Jane Rumble:** Before the polar code discussions, there were guidelines on shipping in the Arctic. If you had a global certificate to use your ship, you would be able to operate it to 70 degrees north and south.

The IMO noticed the increasing diversity and amount of shipping in the polar regions and agreed that there needed to be stronger rules. In fact, it was the Antarctic Treaty Consultative Meeting that asked the IMO to revisit what were originally Arctic guidelines to include Antarctica. There was agreement that there needed to be a binding code, but it is a bit chicken and egg as to which one drives the other. The idea of the cross-government network is that we can try to identify issues that might have an Arctic element in the future,
Foreign and Commonwealth Office and Ministry of Defence (Officials) – Oral evidence (QQ 1 – 15)

or issues that are very clearly Arctic which might have a bearing on another element of Arctic policy.

Q11 Lord Ashton of Hyde: I, too, declare an interest in that I am a director of a Lloyd’s managing agency which underwrites marine business, among other things. Can we turn to the commercial aspects of the Arctic, which is one of the three dimensions, as I think they are called, in the Arctic framework? It says that the UK will facilitate “responsible business activity” in the region by UK companies. What are the Government doing to support business activity in the Arctic by UK companies? What are the major economic opportunities for UK businesses that they should be looking to exploit?

Jane Rumble: In terms of supporting business, there is a clear objective in every diplomatic post everywhere in the world to support UK trade and investment. That is exactly the case, too, in the Arctic states. The British posts in each of the capitals and the consulates across Canada and Russia have a very clear remit to support British business where appropriate. UK Trade & Investment takes a very active role: it has supported a conference on Arctic mining earlier this year and sponsored an Arctic event at the International Festival for Business that took place in Liverpool in June—where we spoke—as well as various prosperity events across the Arctic. There is quite an active forum of support, as there would be for businesses wanting to operate anywhere in the world. In terms of the economic opportunities, I guess the headline ones are mining and hydrocarbons—at least those are the areas that get a lot of headlines, because of the retreating ice. But there are also the financial sector interests including significant interests in insurance around any kind of activity in potentially risky environments, infrastructure development, technology, shipping and, obviously, tourism—so quite broad.
Lord Ashton of Hyde: I was really trying to get at what is specific to the Arctic. As you say, the remit for the Foreign Office diplomats is the same all over the world. That is a general point but I was really trying to look at the Arctic in particular. You mentioned mining, which is one thing. What timescale do the Government think these opportunities will emerge in? Does this depend on the rate of climate change or on other factors?

Jane Rumble: I suppose climate change is the underlying driver, but that is not the whole picture. Whether it is available now depends on the different states. As I mentioned, Norway, which is pretty much ice-free, has a very developed and active hydrocarbon industry in which there are already significant British interests. The Prime Minister of Greenland spoke at an event in March sponsored by the Economist, which I mentioned earlier, promising that Greenland is open for business. They are at the beginning stages of trying to get investment, and the infrastructure in Greenland does not exist yet.

Lord Ashton of Hyde: As far as the UK is concerned, is this urgent? Do we need to get our act together quickly?

Jane Rumble: There is no perceived race to the Arctic. Several companies have been looking at the Arctic for some time and, indeed, mining has been taking place for many decades, as has onshore hydrocarbon activity. So some have been involved for a long time while others are now perceiving the new opportunities coming up. It depends on where you are in terms of that interest whether you perceive it as a race. All the Arctic states say that there is no particular race, and it is really Greenland that seems like the new opportunity, although it does not quite have the infrastructure in place to facilitate some of this.
Lord Ashton of Hyde: Lastly, we have heard the range of views in the NGO community about commercial exploitation. Do the Government feel that the indigenous peoples welcome enhanced commercial activity?

Jane Rumble: The indigenous peoples have different perspectives depending on where they are and on their traditional activities. It seems that there are as many people who Greenpeace can find saying that they do not want any hydrocarbon activity, any investment or any infrastructure in the Arctic against just as many who would like to see this development come soon because they would like jobs and diversity of employment opportunities so that they can stay where they live. It would be impossible to say that the indigenous peoples have a single view on this. It depends very much on where they are and who they are.

Baroness Symons of Vernham Dean: Can I ask about the “there is no race” point? Are you sure that you are not being a little complacent about there being no race? Let us go back to the point about China. The Chinese have sent six major expeditions in the last 12 years or so. They say that, with the ice melt and their ice-breaking capacity, they are going to be sending expeditions every year from next year onwards. The Americans are saying that the ice melt is taking place much faster than they had thought and that from 2016, in two years’ time, there may not be any summer ice. The Chinese are very clear—of course they know that there are all sorts of environmental issues—in what they say about wanting their share of the mineral wealth, which is very considerable, in that part of the world. They make the point that Russia is making claims, so why not China too? You say that there is no race, but when we read some of the things that are being put out by other countries, it sounds as though some of them think that they are engaged in a race not only for the mineral wealth that is there, but
also for the northern sea passage—going back to the point about shipping. It just seems to me a bit uncomfortable to say that there is no race because it sounds as though some people think there is.

Jane Rumble: In terms of access to the mineral resources, China is also a member of UNCLOS so it cannot make a claim to the Arctic seabed or the resources within the auspices of that convention. Virtually all the expected development in the Arctic, certainly in the medium term, is anticipated to be undertaken within the areas of national jurisdiction. It is for the Arctic states to control the speed at which they release licensing blocs or encourage mining activities. The Canadians would say that there is no race. I have heard the Canadian High Commissioner in London make that comment. However, there may be scientific races. China is very keen, as are many other countries, to understand the changing environment in the Arctic, so there is now a desire to make sure that we do understand it because it will have such global consequences. But in terms of the commercial activity, we are not seeing a Klondike-type race. It will be controlled because the Arctic states have jurisdiction over who does what.

Baroness Symons of Vernham Dean: China engages in mineral races throughout the Middle East and throughout Africa, so I fear that, while there are all sorts of ways of saying that this development can be controlled through licensing or whatever—and nobody is suggesting that the Chinese are just going to come along and make a claim to something—they do use their financial leverage very considerably in the races that they engage in across the world. I would just throw that in for what it is worth.
Jane Rumble: In terms of business competition, I am not sure whether we would call it a race, but yes, obviously there are competitive business interests in respect of security of energy supplies and so on.

The Chairman: I am sure that that is something we will pursue. You are right to say that in Africa and South America, it has not exactly got in the way.

Q12 Lord Moynihan: I will come in at this point, not least because I need to make a declaration of interests. I have been a director of Rowan Companies plc for over 10 years. It is an international oil and gas drilling company with a fleet of jack-up rigs and ultra deepwater drill ships which provide contract drilling services and rigs to oil and gas operators. In its 90-year history, Rowan has developed the expertise and technology to operate drilling rigs in extremely cold environments, such as land rigs on the north-eastern side of Alaska and jack-up rigs on the Grand Banks of eastern Canada and the Cook Inlet of Alaska. The company’s land drilling has operated north of the Arctic Circle. However, the company has divested that division and the company’s sole focus is now on offshore, and it has never operated offshore rigs inside the Arctic Circle.

First, if I may, I would like to pick up on Baroness Symons’ point. Is it the case that the race to which she alluded is a recognition by countries such as China of the opportunity now, as a matter of commercial urgency, to park there with highly prospective deals with the Arctic states in, for example, the hydrocarbon area? That has been evidenced by their relationship with a growing number of Arctic states—and, indeed, the US has taken a not dissimilar view within the hydrocarbon sector. I would be grateful if you could first comment on that as a supplementary to the last question. Then, perhaps I may come on to a related issue to the question put by Lord Tugendhat. It is not so much on the NGO side, but how receptive you
believe the UK public have been to the notion of further economic development in the Arctic. Are you getting a growing postbag and is there increasing interest among the British public, including the NGOs, about activity and Government support for, for example, mining and shipping access for tourism, and for energy security? Is this an area that is taxing your department more than it did in the past or less? Can you give us a flavour of the level of interest that you are encountering from the UK public in the Arctic as a whole? Is it mainly on the commercial side or is there now growing interest in climate change?

Jane Rumble: In respect of the first comment about highly prospective deals, I think that it is the case. As I have mentioned, the Prime Minister of Greenland has repeatedly said that Greenland is open for business. To do business in Greenland, which is undoubtedly going to have mineral wealth—there are mineral deposits which are already known about—it must be accepted that it does not necessarily have the infrastructure that would make it an easy proposition. If you have lots of money and a very long-term vision, you can start that process now. Whether or not British businesses want to do so is up to them. The opportunities are out there, although some of them are extremely challenging. In terms of global competition, those that wish to invest in speculative, long-term developments will do so. There are British companies which have bought the rights to licensing blocs in and around Greenland going up quite far north and they are looking at what that might mean for them, but there is a long way to go before they will actually make money out of that—having put the infrastructure and so on in place.

In terms of public interest in the Arctic, it depends how you define “public”. In general terms, there are so many Arctic conferences that we cannot cover them all. At the moment, we get invited to many, looking at very different issues from commercial activity to scientific
interests. In terms of the sectors that we expect to be interested in the Arctic, interest within the UK is growing. There is much more focus in those areas. The NGOs are taking an increasing interest. They have raised the issues around hydrocarbon activity. You may recall that Greenpeace took a mechanical polar bear through London to raise the issues around the Arctic. We do not have a big postbag from members of the public writing to us about the Arctic. That may be because the Foreign Office role is mainly on the strategic UK interests and the Government’s engagement. I am sure that if you asked Defra whether it has people writing in about the plight of the polar bear and potential changes in the Arctic, or asked DECC how many letters it gets about hydrocarbon activity in the Arctic, there would be a great deal of interest. In terms of some of the sectors you mentioned, yes, tourism is a growing interest, and we work very closely with our posts in the Arctic states around issues such as search and rescue, being in very remote areas, and the availability of hydrographic charting which is still quite sparse in the Arctic. We also work with the Association of Arctic Expedition Cruise Operators, AECO, which represents many of the operators that work in Norway, Greenland, Iceland, northern Europe and now increasingly Canada to try to foster co-operation among cruise ships taking passengers into remote areas a long way from search and rescue. We have learnt over many years that wherever there is a cruise ship in the world it almost certainly has a British national on board. That is very much true in the Arctic and Antarctic. There is a lot of interest, which also underlies our great focus with the Maritime and Coastguard Agency on the polar shipping code to try to ensure that those ships are adequately provisioned for that kind of activity. Does that answer your question?

**Lord Moynihan:** Have we led any trade missions? Are we giving any expertise to businesses that express an interest in prospectivity inside the Arctic circle?
Jane Rumble: I do not know the answer to that. I would have to check and come back to you whether there has been an explicit trade mission to the Arctic. I do not think so but I can check. There have certainly been trade missions to Arctic states, which will have an element of businesses in the high north.

The Chairman: Just on this area again, in terms of environmental protection, do the Government feel that the level of environmental protection and the rules and regulations in the high north are sufficient? I presume that they are a matter of individual sovereign-state legislation or is there an Arctic Council consensus or agreement on what those levels should be in terms of environmental protection? Can you just take us quickly through that?

Jane Rumble: There are both. Each of the Arctic states will have their own agreements on environmental protection standards but the Arctic Council does look and has actively looked at standards for oil and gas trans-shipment practices etc. Other organisations are looking at raising standards of tourism. Environmental protection is one of those issues where you can never rest on your laurels. Technology is always improving. Our understanding of the impact that different activities have on the fragile Arctic environment is always expanding. It is an area where we are constantly striving to promote as far as we can the best practice but the best practice is always increasing. The hydrocarbon companies that we talk to are also very keen to demonstrate that they are making the best environmental impact and also gathering data as their activities proceed. It is an area of focus of the Arctic Council to try to ensure that those standards are raised across the board.

Lord Hannay of Chiswick: If, as a result of the melting of the sea ice, it becomes practicable to mine or drill for hydrocarbons in areas that are not under national jurisdiction, what rules will cover those activities? I assume that there are none at the moment.
Jane Rumble: It falls to the International Seabed Authority to take proposals for deep-sea mining or activities in areas beyond national jurisdiction. It would come under that organisation. There would not be a vacuum.

Lord Hannay of Chiswick: Right. But there are not any mines at the moment.

Jane Rumble: Not in the Arctic, no.

Q13 Lord Oxburgh: I need to declare my interests. I am the director of two small companies which have renewable energy interests, 2OC and Green Energy Options. I am a fellow or member of a range of organisations that have stated policies on climate change, namely the American Geophysical Union, the Geological Society, the Geological Society of America, the Royal Society, the US and Australian Academies of Sciences and the Royal Academy of Engineering. The UK is among a handful of countries that have a very successful history of exploration and research in the Arctic over the last hundred years or so. The level of UK activity in the Arctic has steadily increased, particularly in recent decades. To what extent do you feel that our research and exploration record in the Arctic strengthens our locus in the Arctic Council?

Jane Rumble: It is very significant in terms of the UK’s contribution to Arctic science. A Danish report quite recently put the UK as having the third largest share of articles on the Arctic and also a high citation index. I think we were second on Antarctica, too, so we have a considerable body of polar expertise in the UK. It is certainly one of the things that the Arctic states are particularly keen to tap into and get engagement from. Our scientists are extremely active in a whole range of Arctic issues, including the International Arctic Scientific Committee, IASC. Yes, there is a lot of UK engagement.

Lord Oxburgh: Is there no feeling that we are doing science in other people’s back gardens?
Jane Rumble: No. Science does not tend to get that reputation because there is a great deal of recognition that it provides you with a building block on which you then make policy. Science is just gathering facts so it is not going in and telling people how to run their back gardens; it is an understanding of the collective environment. The UK partners with the Arctic states. It is also very clear that we have resources that we share freely with people. The Hadley Centre has one of the best Arctic ice models. There is the European Cryosat looking at ice thickness. All that information is made available so it is not perceived that that is the case.

Lord Oxburgh: The recent document from the World Economic Forum put great emphasis on the importance of scientific research in the Arctic, particularly because the Arctic was going to be “more used” in all sorts of ways and that if you really want to know the danger spots and where the vulnerabilities lie you need really good background information that involves a much closer network of observations of a whole variety of kinds than we have at present. Does the Arctic Council take that on board? Does it promote or initiate, if you like, survey studies of this kind? Good science can come from it but it is not science itself; it is laying a whole range of background quantities. Does anything like that happen?

Jane Rumble: Yes. In fact the Arctic Council has built a lot of its success on doing Arctic assessments. It spent many years doing that, to the envy of a lot of other regional bodies. It started with the Arctic climate impact assessment back in the mid-2000s, which was a seminal document that set out the 10 big things that were happening in the Arctic and really put the Arctic on the front page, including in the UK. It has also done biodiversity and marine pollution assessments. It does a lot of work bringing together information to paint that picture. There are gaps in that information. There is a huge body of things that we do not know that scientists still need to look at. But there is also concern that they do not
necessarily have as much information as they would like from the Russian Arctic, and they want to get greater access. The Arctic Council is now looking at how they might facilitate easier scientific co-operation within the Arctic. As we understand it, that is going to be an agreement among the Arctic states but it is something that we are particularly active on to make sure that it does not prejudice our interests. There is no desire to keep British scientists out. They want more British scientists in.

**Lord Oxburgh:** Does the Arctic Council have money that it can spend on research?

**Jane Rumble:** It does not necessarily have funding for science per se but if the Arctic states agree that there is a particular desire to do such science then they can put money into project funds and working groups. One of the desires behind having an agreement is that the Arctic States can then turn to their bodies that fund science and say, “This is really quite important now so could you put a bit more priority on the Arctic?” The Arctic Council does not direct funding into particular science. Science is funded in a separate way to keep it away from foreign ministries but it collectively can have the impact of saying that these are questions that need to be answered.

**Lord Oxburgh:** So to summarise, you see UK Arctic science as an important arm of UK Arctic policy?

**Jane Rumble:** Absolutely, yes.

**Viscount Hanworth:** Are we all, including the Russians, signed up for co-operation in the Arctic region?

**Jane Rumble:** The scientists are very keen for it to be easier for them to facilitate access and engage with science. Russian scientists are very keen to agree the broader science access agreement with the Arctic Council because they say that this will help to lever greater
funding from within Russia to prioritise it. They have the challenge of getting the funding together that they need. From a scientific perspective, they are very keen to engage on cross-Arctic studies.

**The Chairman:** Lord Moynihan, did you wish to come in on this one?

**Lord Moynihan:** Not on this one. I have a completely separate question for the MoD officials, at the end.

**The Chairman:** I think we are there actually. I have a couple of tie-up questions, but please go first.

**Q14 Lord Moynihan:** I have a very brief question. Given the announcement today and the emphasis on the fact that NATO has no intention of raising its presence and activities in the high north, why do the Government continue to place a significant emphasis on training British troops in Arctic conditions in Norway? I am happy if you want to write to us on that.

**Martin Molloy:** NATO has mandated that a certain number of its troops are trained in cold-weather capability. It wants a cold-weather capability within its structure, so each sending nation is expected to train a certain number of troops to a certain level. Because of the Antarctic issue and others, we train 3 Commando Brigade down to minus 20. It is not Arctic temperatures, but it is cold-weather training. We do the same thing for our helicopters. That is a NATO request more generally rather than focusing on the Arctic.

**Lord Ashton of Hyde:** Because of our presence in Afghanistan, is it true that we have cut back our Arctic training in recent years?

**Martin Molloy:** I will need to come back to you on that one, I think. We have reduced our Antarctic helicopter capability in recent years. It was an SDSR decision.

**Lord Ashton of Hyde:** I was thinking particularly of the Marines.
Martin Molloy: In terms of the Marines, I am not aware. I will need to come back to you on that.

The Chairman: Following that up, do our surface ships visit the Arctic?

Martin Molloy: They do go to the high north, but they do not go into northern Arctic waters. The whole capability is not there, but we do go to the high north: the Bering Sea, Norway, Finland, Sweden and so forth. So we do make high north trips but we do not go into far north waters.

The Chairman: Perhaps we could tie up a couple of loose ends. One thing that is often said, and I suppose one of the lessons from the literature, is that if you look at the Arctic as a region the first thing you have to do is not apply any lessons you have learnt from the Antarctic, because it is completely different. Given that we have an important presence in the Antarctic, is that statement true or are there any points that we should take note of from our Antarctic experience?

Jane Rumble: Yes, probably quite a few. The Antarctic in governance terms is completely different, because one is a continent on which there is a treaty to suspend territorial claims, the other is body of water that is surrounded by countries with full jurisdiction. So in governance terms, they are chalk and cheese. But in terms of the climate change challenges, the rapid warming, there are a lot of similarities in the challenges to shipping, challenges to tourism activities and in terms of science and understanding the planet. But then, the Arctic has 4 million people who live and work there and undertake mining and hydrocarbon activity, and the Antarctic has no indigenous population and a prohibition on mineral-related activity except for science. Whether you cannot learn anything, or whether they are actually quite closely coupled, depends on the subject.
Q15 The Chairman: That is a good list. Lastly, in terms of geopolitics, we have had the recent fallout between the Russian Federation and much of the western world over Crimea and the G8 becoming the G7 again. How insulated is the Arctic Council from these wider global frictions? Does it just carry on regardless or do they affect the way that Arctic co-operation works?

Jane Rumble: In terms of what is actually happening, the Arctic Council’s senior Arctic officials have met since the Ukraine crisis, and they met as normal and undertook normal business. There have been a number of meetings since then, in fact at least two that were hosted by Russia in Moscow, which the US and Canada, as Arctic states, did not attend because of the crisis. In terms of the senior Arctic officials level, the desire is to continue Arctic co-operation. In terms of the working groups, there has been some knock-on. We have not had a full Arctic Council ministerial meeting since the crisis, so I guess there will be an assessment nearer that time as to whether or not there will be an impact. But there has not been a significant impact at this stage.

The Chairman: Thank you very much indeed. That brings to an end the formal evidence session. Thank you all very much indeed for participating in that. It is a good start to our process. From the Committee’s point of view, I guess very much like the Government, we are not looking to actively interfere in the Arctic but to find a way that we can help that region, as a near-Arctic state, as you say. I thank members of the public for attending as well. Perhaps I can bring this public session to a close and ask members of the public to leave at this stage, but thank you for attending.
### International agreements (or bodies with regulatory powers) of material relevance to Arctic debate

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<thead>
<tr>
<th>Name of agreement</th>
<th>Category</th>
<th>Summary</th>
<th>Signatories</th>
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<tr>
<td>United Nations Convention on the Law of the Sea (UNCLOS)</td>
<td>Governance</td>
<td>Lays down a comprehensive regime of law and order in the world’s oceans and seas establishing rules governing all uses of the oceans and their resources. It enshrines the notion that all problems of ocean space are closely interrelated and need to be addressed as a whole. The Convention comprises 320 articles and nine annexes, governing all aspects of ocean space, such as delimitation, environmental control, marine scientific research, economic and commercial activities, transfer of technology and the settlement of disputes relating to ocean matters.</td>
<td>166 ratifications, including all Arctic States except the United States, and the UK</td>
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<tr>
<td>International Maritime Organisation</td>
<td>Shipping</td>
<td>A specialized agency of the United Nations, IMO is the global standard-setting authority for the safety, security and environmental performance of international shipping. Its main role is to create a regulatory framework for the shipping industry that is fair and effective, universally adopted and universally implemented.</td>
<td>Has 170 Member States, including all Arctic States and the UK, and three Associate Members</td>
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<td>The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)</td>
<td>Environment</td>
<td>OSPAR is the mechanism by which fifteen Governments of the western coasts and catchments of Europe, together with the European Union, cooperate to protect the marine environment of the North-East Atlantic. It started in 1972 with the Oslo Convention against dumping. It was broadened to cover land-based sources and the offshore industry by the Paris Convention of 1974. These two conventions were unified, up-dated and extended by the 1992 OSPAR Convention. The new annex on biodiversity and ecosystems was adopted in 1998 to cover non-polluting human activities that can adversely affect the sea.</td>
<td>Belgium, Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom</td>
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<td>Regional Fisheries Management Organisations (RFMOs)</td>
<td>Fisheries</td>
<td>RFMOs are international organisations formed by countries with fishing interests in an area. Some of them manage all the fish stocks found in a specific area, while others focus on particular highly-migratory species. The organisations are open both to countries in the region (“coastal states”) and countries with interests in the fisheries concerned. While some RFMOs have a purely advisory role, most have management powers to set catch and fishing effort limits, technical measures, and control obligations. The two main geographical based RFMOs overlapping with the Arctic are the North East Atlantic Fisheries Commission (NEAFC) and the Northwest Atlantic Fisheries Commission (NAFO).</td>
<td>NEAFC: Denmark*, European Union, Iceland, Norway, Russian Federation. NAFO: Canada; Cuba; Denmark*; European Union; France**; Iceland; Japan; South Korea; Norway; Russia; Ukraine; United States of America</td>
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<td>Food and Agriculture Organisation of the United Nations</td>
<td>Food supply /fisheries</td>
<td>Three main goals are: the eradication of hunger, food insecurity and malnutrition; the elimination of poverty and the driving forward of economic and social progress for all; and, the sustainable management and utilization of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations. Have a role regarding some RFMOs and the UN Fish Stocks Agreement.</td>
<td>194 member countries including all Arctic States and the UK</td>
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<td>UN Fish Stocks Agreement</td>
<td>Fisheries</td>
<td>Full name is “The Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks”. The agreement sets out principles for the conservation and management of those fish stocks and establishes that such management must be based on the precautionary approach and the best available scientific information. The Agreement elaborates on the fundamental principle, established in the Convention, that States should cooperate to ensure conservation and promote the objective of the optimum utilization of fisheries resources both within and beyond the exclusive economic zone.</td>
<td>81 ratifications, including all Arctic States and the UK</td>
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<td>UN Framework Convention on Climate Change (UNFCCC)</td>
<td>Climate</td>
<td>International environmental treaty negotiated at the United Nations Conference on Environment and Development (UNCED), informally known as the Earth Summit, held in Rio de Janeiro from 3 to 14 June 1992. The objective of the treaty is to “stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”. The treaty provides a framework for negotiating specific international treaties (called “protocols”) that may set binding limits on greenhouse gases.</td>
<td>196 Parties to the Convention, including all Arctic States and the UK</td>
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<tr>
<td>UN Convention on Biological Diversity (CBD)</td>
<td>Environment</td>
<td>The Convention establishes three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits arising from the use of genetic resources. There is no specific focus on Arctic issues. However, pursuant to article 4 of the Convention, all the relevant provisions of the Convention apply to all areas within the limits of national jurisdiction, including the Arctic. The Arctic also often gets a specific mention within Decisions of the Conference of the Parties and a number of reports have been provided to the CBD on the topic. For example, Decision XI/6 contains a specific section on collaboration on arctic biodiversity. In addition, all cross-cutting issues, in particular the ecosystem approach, guidelines for the incorporation of biodiversity considerations in EIA and SEA procedures, are applicable to arctic ecosystems.</td>
<td>194 Parties to the Convention, including all Arctic States except the United States, and the UK</td>
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<td>Stockholm Convention on Persistent Organic Pollutants</td>
<td>Environment</td>
<td>Global treaty to protect human health and the environment from persistent organic pollutants (POPs). The Stockholm Convention is strongly linked to Arctic issues and the concerns of the Inuit and other indigenous peoples of the Arctic since Arctic ecosystems and indigenous communities are particularly at risk because of the biomagnification of persistent organic pollutants and that contamination of their traditional foods is a public health issue.</td>
<td>179 Parties to the Convention, including all Arctic States and the UK</td>
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<td>Convention on the Conservation of Migratory Species of Wild Animals (CMS)</td>
<td>Environment</td>
<td>Aims to conserve terrestrial, marine and avian migratory species throughout their range. Parties to CMS work together to conserve migratory species and their habitats by providing strict protection for the endangered migratory species listed in Appendix I of the Convention. CMS has no specific focus on the Arctic region or Arctic issues. However, the range of many species of CMS interest includes Arctic areas, and these species depend on Arctic habitats/ ecosystems for at least part of their life cycle.</td>
<td>120 Parties. All Arctic States are Range States or Parties to the convention. The UK is a Party to the Convention.</td>
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<tr>
<td>Convention on Long-range Transboundary Air Pollution</td>
<td>Environment</td>
<td>The aim of the Convention is to limit and, as far as possible, gradually reduce and prevent air pollution including long-range transboundary air pollution. The Convention has been extended by eight protocols that identify specific measures to be taken by Parties to cut their emissions of air pollutants.</td>
<td>51 Parties including UK and all Arctic countries</td>
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<tr>
<td>Convention on International Trade in Endangered Species</td>
<td>Environment</td>
<td>Aims to that international trade in specimens of wild animals and plants does not threaten their survival, as well as addressing issues of illegal trade. Species are offered three levels of protection according to the level of threat. CITES has no specific focus on the Arctic region or Arctic issues but species of CITES interest include those found in Arctic areas. The status of the Polar Bear under CITES is the subject of contentious and repeated discussion.</td>
<td>180 Parties, including all Arctic States and the UK</td>
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21 July 2014
UK trade missions to the Arctic

During the Committee’s oral evidence session conducted on 9 July 2014, FCO officials promised to write to the Committee confirming details of any specific trade missions the UK has conducted to the Arctic.

The UK has not conducted any Arctic-specific trade missions to the Arctic in the last three years. However, as Jane Rumble, Head of the Polar Regions Department said in her oral evidence, there have been a number of trade missions to some of the Arctic States that have had an Arctic element.

Examples in the last three years include:

- UKTI Oslo have run three trade missions to Norway for companies in partnership with Scottish Development international;

- UKTI Oslo have run two missions for NOF (the North-East’s trade association) covering opportunities for the offshore industry. Approximately 40 delegates participated who covered a wide range of services and supplies for the oil and gas sector;

- UKTI Helsinki organised a mining cluster trade mission to Finland in March 2013. The British delegates came from the Association of Mining Analysts, Association of British Mining Equipment Companies, British Water, Imperial College London and Mineral Industry Research Organisation. Together the UK organisations represented over 600 individual companies, involved in mining related products and services from different sides of the cluster.

21 July 2014
1. The Government’s policy towards the Arctic was set out in its Arctic Policy Framework: *Adapting To Change* published in October 2013. This note addresses issues raised by the eight questions posed by the Committee in its call for written evidence, along with other specific issues that the Committee has signalled an interest in during its earlier oral evidence sessions – namely, the United Nations Convention on the Law of the Sea (UNCLOS); enforcement of International Maritime Organization (IMO) regulations; and the Organisation for Security and Cooperation in Europe (OSCE).

*What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?*

2. Climate change is the greatest threat facing the Arctic. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2013 and 2014) clearly presents a compelling case supporting observed and projected changes resulting from continued emissions of greenhouse gases. The UK is a global leader on both pushing for reduced emissions of greenhouse gases and understanding its effects and is therefore playing a leading role in tackling the underlying causes of the rapid changes facing the Arctic.

3. There have been a large number of studies over the last decade looking at the regional and global impacts of climate change in the Arctic. For example, the Arctic Council has produced a number of authoritative assessments, including the 2004 Arctic Climate Impact Assessment and the 2011 *Snow, Water, Ice and Permafrost in the Arctic* (SWIPA) Assessment, to which the UK made major contributions; as well as a raft of more issue specific reports covering the impacts on both human and natural systems. The Government also refers the Committee to the written evidence submitted by the Natural Environment Research Council and the British Antarctic Survey for a fuller scientific consideration of the regional and global impacts.

4. The changes being seen in the Arctic matter to and are impacted by the UK. Non-Arctic States contribute to climate change and are sources of Arctic pollutants. But changes in the Arctic also impact on the UK and other non-Arctic States, through for example melting ice-caps, glaciers and ice-sheets contributing to global sea-level rise; changes in sea-ice and freshwater in the Arctic Ocean having the potential to impact on the UK’s weather and climate; or changes to Arctic habitats affecting migratory species from around the world, including the UK. The Arctic is also thought to hold around 25% of the world’s undiscovered hydrocarbons; has large deposits of rare earths used in the manufacture of high-end technology products; and has the potential for new global shipping routes between Europe and Asia; all of which affect global markets.
5. It is because of these impacts and the fact that the changes in the Arctic are still not fully understood that a central tenet of the UK's policy towards the Arctic is to promote greater understanding of the region through international scientific collaboration and to promote policy development on the basis of sound science. An ongoing example of British scientists playing a leading role in directly addressing these questions is through the EU funded ICE-ARC project, which will directly assess the social and economic impact of Arctic sea-ice loss.

**Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities, and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?**

6. The changes being seen in the Arctic and the reduction in summer sea-ice in particular have led to growing commercial interest in the Arctic, from a diverse range of industries and an increasing number of countries. For example, in the report *Arctic Opening: Opportunity and Risk in the High North*, Lloyds, in association with Chatham House, estimated that the Arctic is likely to attract substantial investment over the coming decade, potentially reaching $100bn or more.

7. However, significant challenges remain for commercial operators in the Arctic. Some projected changes in the Arctic, such as increasing numbers of icebergs and stormier weather, can increase the risks to commercial activities. Decisions to invest in commercial projects are dependent on a number of complex factors, including political will, economic viability, legal regimes and patterns of investment. For some activities the costs and challenges involved may well preclude them from ever taking place.

8. Ultimately, the decision to invest in projects in the Arctic is a matter for the individual companies concerned and the relevant national authorities of the Arctic States in whose jurisdiction they take place.

9. The UK Government will encourage British business to engage directly with the Arctic States, the Arctic Council, indigenous peoples and other actors as appropriate. The UK will advocate for and facilitate responsible business activity in the region by British companies, including through its UK Trade and Investment (UKTI) services. For example, UKTI has promoted opportunities for British mining companies in the Arctic, including hosting a mining trade mission to Finland in March 2013; and an arctic mining conference in London in March 2014 that attracted over 100 companies involved in exploration and junior mining, construction and infrastructure, financial & professional services and equipment & machinery.
How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?

10. Ensuring the sustainable development of the Arctic is part of the overall governance framework of the Arctic, which rests with the sovereign Arctic States, supplemented and complemented by international agreements and treaties. The regulation of commercial development in the Arctic is therefore a matter for the relevant national authorities in the Arctic States in whose jurisdiction they take place.

11. As part of this governance, the Arctic Council plays a valuable role in assessing the potential impacts of commercial development in the Arctic; helping build the science base to underpin decisions; promoting cooperation and collaboration; and in developing and disseminating good practice.

12. Businesses operating in the Arctic also have a role to play. The Arctic Economic Council (AEC), recently set up by the Arctic Council, has the potential to link business expertise and experience of operating in the Arctic with the decision-making of the Arctic Council. Businesses operating in the Arctic could help develop and share understanding of the Arctic environment; conduct genuine engagement with local Arctic communities; and develop an understanding of the risks and impacts involved with their operations.

13. The Government will support the use by the Arctic States of the highest standards of environmental regulation of commercial activities in the region. The Government will also play a leading role in international organisations involved with the development of international regimes of importance to the Arctic (see table at Annex B for examples of international regimes applicable to the Arctic) to help ensure high environmental standards apply to the Arctic, as elsewhere.

What are the human aspects of the expected climatic and economic changes in terms of local populations, current and future?

14. The area within the Arctic Circle is home to around four million people spread across the eight Arctic States. Indigenous peoples have lived in the Arctic for millennia. Different groups all have their own identities, cultures, languages and traditions. Indigenous groups are represented at the decision-making table of the Arctic Council and play a key role in steering its work.

15. The Arctic Council has long been concerned with the impacts that the changes in the Arctic are having on the people that live there and has undertaken an array of projects over the last decade. Examples include the Arctic Climate Impacts Assessment; Arctic Human Development Report and follow up; and the Arctic Social Indicators projects,
aimed at monitoring ongoing impacts and trends. British scientists are also active in this field, for example through the EU’s Arctic Climate Change, Economy and Society (ACCESS) project that will evaluate Arctic climate change scenarios and their impact on specific economic sectors and human activities over the next decades.

16. The UK Government respects the views, interests, culture and traditions of Arctic indigenous peoples and will use its observer status at the Arctic Council to support the right of its Permanent Participants to be heard at the decision-making level of the Council.

Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?

17. Arctic research is a very active field not just within the Arctic States, but in the UK, the EU and other actors. However, given the scope and complexity of issues at play in the Arctic and their interconnectedness with global processes, large areas of uncertainty still remain. The Government refers the Committee to the written evidence submitted by the Natural Environment Research Council and the British Antarctic Survey for fuller consideration of the science gaps.

18. An important part in addressing gaps is through greater coordination and collaboration amongst the scientific community. The Arctic Council is trying to address this as it discusses options for improving scientific cooperation amongst the Arctic States through its Task Force on Scientific Cooperation. The Government also has in place Memoranda of Understanding on Polar science with Norway and Canada to enable greater cooperation between our scientists.

19. Many decisions are being made now regarding the development of the Arctic by Arctic States and the Arctic Council based on the research available. However, there is a continual challenge to both scientists and policy makers to ensure future research continues to be speedily translated into policy recommendations to help underpin sound decision-making. This is something that the Arctic Council has taken steps to address in recent years, with many of its more successful and recent reports containing summaries and recommendations for policy makers. The Government’s Science and Innovation Network is also actively involved in translating science into policy through its activities with Arctic States.

Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?

20. Climate change is the biggest threat facing the Arctic. The UK’s goal, shared by the EU and recognised by all countries following the 2010 UN climate summit in Cancun, is to
establish clear objectives for reducing human-generated greenhouse gas emissions over time to limit the global average temperature rise to below 2°C above pre-industrial levels. The temperature rise in the Arctic would likely be considerably higher than this with subsequent regional and global impacts. The mitigation of greenhouse gas emissions therefore needs to happen on a global scale. The UK will continue to play a leading role in negotiating a legally binding global climate change agreement to be agreed in 2015; it will support action in other countries to build mitigation capacity around the world; and lead by example by cutting its own emissions of greenhouse gases by 80% below 1990 levels by 2050 through the Climate Change Act 2008.

21. Actions to reduce short-lived climate pollutants, such as methane and black carbon, are a crucial complement to reducing emissions of carbon dioxide, and have a particular relevance to the Arctic. The Arctic Council has established a Task Force for Action on Black Carbon and Methane, which is due to report to Arctic State Ministers in 2015. The UK has been actively involved in the work of the IMO to reduce black carbon emissions from shipping, an increasingly important source of local black carbon in the Arctic.

22. Adapting to climate change is emerging as an increasingly urgent concern as the impacts of climate change are becoming more apparent across the Arctic. The Arctic Council started a multi-phase Adaptation Actions for a Changing Arctic (AACA) project in 2012 looking at existing and future adaptation programmes and tools for the Arctic. The Arctic Council is also looking at the resilience of ecosystems and human communities to change, through a four-year Arctic Resilience Report and work on ecosystem-based management, which the UK has contributed expertise to. The WWF has also developed its Rapid Assessment in Circum-Arctic Ecosystem Resilience (RACER) project, which the UK helped pilot in Antarctica.

Are the current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

23. The Government believes the current governance arrangements in the Arctic are working and provide a solid foundation for responsible management of the region.

24. Governance of the Arctic rests with the sovereign Arctic States supplemented and complemented by international agreements and treaties, in particular the UN Convention on the Law of the Sea. For the Committee’s information, further details on UNCLOS and the Arctic are attached at Annex A; examples of international frameworks and organisations of particular importance to the Arctic are at Annex B; and details on how the IMO develops regulations applicable to shipping and how states enforce them are at Annex C.
25. The Arctic Council provides an excellent and appropriate addition to this framework, with a successful history of engendering cooperation and coordination on cross-boundary issues that affect the Arctic; sharing and disseminating good practice; and developing the evidence-base for policy decisions. The Council also provides for the participation of indigenous groups, ensuring that many of the issues of importance to the indigenous peoples are given priority in the work of the Council. The Arctic Council has adapted to the increasing priority attached to the Arctic, including by establishing a permanent secretariat and in 2013 granting observer status to a further six countries. The Arctic States have also agreed two legally binding agreements under the Council’s auspices on search and rescue and oil spill preparedness and response.

26. A peaceful, stable and well-governed Arctic is the bedrock on which all of the Government’s policies towards the Arctic are based. The Government is committed to preserving the stability and security of the Arctic region by supporting and respecting the sovereign rights of the Arctic States to exercise jurisdiction over their territory; supporting moves by the Arctic States that promote governance in conjunction with international law; and supporting the Arctic Council as the pre-eminent regional forum for discussing Arctic issues and the stability it provides for discussion amongst Arctic States. The UK also participates in the Arctic Security Forces Roundtable forum, which promotes security co-operation on issues such as situational awareness and search and rescue missions.

27. The Government notes the Committee’s interest in whether or not there might be a role for the Organisation of Security and Cooperation in Europe (OSCE) in the Arctic. Any role for the OSCE would need a mandate agreed by consensus of all OSCE participating States and the Government is firmly of the view that there is no role for the OSCE in the Arctic given the region’s current low tension and high degree of cooperation. Further background on the OSCE is attached at Annex D.

28. At the same time, the Government recognises that wider geo-political changes, combined with the uncertain effects of environmental and commercial pressures, could create potential security implications in the future. The Government is alert to these risks and maintains an active but proportionate horizon-scanning position in combination with international partners.

How effectively does the UK interact with Arctic governance structures? Is the UK Government’s approach, as set out in the Arctic Policy Framework, proportionate and appropriate?

29. The Government pursues its Arctic interests through a mixture of bilateral and multilateral engagement with the Arctic States and international organisations and fora with Arctic components. The UK is actively involved in negotiations in all the
international organisations and fora listed at Annex B and has been instrumental in delivering many of the key global agreements that now apply to the Arctic.

30. Government policy is based on engagement with the governance structures that promotes and protects British interests and priorities as outlined in the Government’s Arctic Policy Framework. The Government balances the pursuit of these interests with the fact that the UK is not an Arctic State and has no territorial jurisdiction in the Arctic.

31. The Arctic Policy Framework set out the Government’s main Arctic interests and overall approach to the Arctic. However, given the rate and extent of the changes being seen in the Arctic, the Government is clear that its policy towards the Arctic be kept under review to ensure it remains current. The Government therefore welcomes debate about its Arctic policy and is looking forward to the Committee’s report in due course.


International law of the sea is made up of those rules and principles which regulate relations between states in respect of the oceans and ocean resources. These rules are derived from treaty and customary international law.

Historically, beyond the jurisdiction exercised by coastal states over a narrow belt of sea surrounding a State’s coastline, the oceans were open to the unrestricted use by all states. However, by the middle of the twentieth century, some States started extending claims over the waters surrounding their coasts to exploit offshore resources. There was also growing concern over the toll taken by overfishing and concerns over the threat of pollution and waste from ships and oil tankers. These developments lead to calls for a more effective international regime and discussions started on a new treaty.

States begun by reaching agreement on a new treaty on the international law regarding the high seas in the form of the 1958 Convention on the High Seas but just a few decades later, States agreed a much wider-ranging treaty which remains the legal framework within which all activities in the oceans and seas must be carried out. That treaty was the United Nations Convention on the Law of the Sea (UNCLOS). It was concluded in 1982, but only came into force after the Agreement Relating to the Implementation of Part XI of the UN Convention was adopted in 1994. Part XI deals with management of mineral resources in the Area, that is the area beyond any state’s jurisdiction.

UNCLOS lays down a comprehensive regime of law and order in the world’s oceans, governing all uses of the oceans and their resources. It is now the globally recognised regime dealing with all matters related to the law of the sea with 166 States Parties and so a relatively small minority of States not being a party. And the few states who are not a party

25 Some notable non-state parties include the USA, Turkey, Israel and Venezuela
tend to comply with the provisions of UNCLOS, many of which are thought to be customary international law (and therefore biding upon all States). The UK became a party in 1997.

**Maritime zones**

One of the important aspects of UNCLOS is that it sets out the rights and responsibilities of coastal states in the various maritime zones. In determining the extent of a coastal state’s maritime zones, it is necessary to first establish the points on the coast from which the zones are to be measured. The “baseline” is the line from which the outer limits of the maritime zones can be determined. The baseline forms the boundary between internal waters (the landward side of the baseline) and the territorial sea (seaward side of the baseline). UNCLOS contains rules for determining how baselines should be drawn, including along heavily indented coastlines, across bays, and which features can be used to draw a baseline. For example, where a straight baseline has been drawn across a bay (in accordance with the method set out in the Convention), the internal waters are the waters within that bay.

**Internal waters**

States have territorial sovereignty over internal waters and there exists no general right of passage through them.

**Territorial sea**

In accordance with UNCLOS, a coastal state has territorial sovereignty over its territorial sea, and it also has sovereignty over the airspace over the territorial sea internal waters. The territorial sea may be established up to a limit not exceeding 12 nautical miles (nm) from baselines (rather than the historic 3nm limit).

**Archipelagic waters**

An archipelagic state may draw straight archipelagic baselines joining the outermost points of the outermost islands and drying reefs, providing that within such baselines the ratio of the area of water to the area of land, including atolls, is between 1:1 and 9:1, and providing certain conditions about the length of such baselines are met i.e. that they are not excessive. The waters within the baselines are archipelagic waters.

**Contiguous Zone**

A contiguous zone may be claimed by a coastal state for the exercise of powers relating to customs, fiscal, immigration and sanitary purposes only. The zone is contiguous to and

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26 Also see diagram on p10

27 One exception is where internal waters have been enclosed by a straight baseline regime through which a right of innocent passage can exist.

28 None of the Arctic States claim Archipelagic status under UNCLOS but some, by the drawing of straight baselines around their outer islands and calling the waters within those baselines internal, the effect is similar.
seaward of the territorial sea and may not extend more than 24nm from baselines. (The UK does not claim a contiguous zone.)

**Exclusive Economic Zone (EEZ)**
A coastal state can claim an EEZ extending up to 200nm from the baseline, with the inner limit being the outer limit of the territorial sea. Within the EEZ a coastal state has sovereign rights with respect to exploring, exploiting, conserving and managing natural resources (including fish) and certain economic activities (e.g. the production of energy from the waters, currents, winds), and exercises jurisdiction over marine scientific research and environmental protection. (Until recently the UK had four maritime zones within the 200nm limit that made use of the powers available to coastal states in their EEZ e.g. an Extended Fisheries Zone and a Pollution Zone. These were rationalised into one EEZ which came into force on 31 March 2014.)

**Continental Shelf**
A coastal state has sovereign rights over its continental shelf for the purposes of exploring and exploiting its natural resources (e.g. hydrocarbons). The continental shelf comprises of the seabed and subsoil of the submarine areas that extend beyond its territorial sea, throughout the natural prolongation of the land territory, to the outer edge of the continental margin, or to a distance of up to 200nm when the continental margin does not extend that far. The rights of a coastal State over its continental shelf are inherent; they do not depend on occupation or express proclamation.

Where a State believes its continental shelf extends beyond 200nm, it is necessary to make a submission to the Commission on the Limits of the Continental Shelf (CLCS). The CLCS is a body establish by UNCLOS to consider those submissions. By its own Rules of Procedure the CLCS cannot consider submissions that are subject to an objection by third parties (these usually occur where there are overlapping claims). Where the continental shelf goes beyond 200nm, the rights of the coastal state over that part of the shelf extending beyond 200nm are slightly different. In particular, exploitation of non-living resources is subject to additional restrictions: payments or contributions in kind must be made to the International Seabed Authority, which shall distribute them to States Parties to the Convention on the basis of equitable sharing criteria taking into account the needs of developing states, particularly the least developed and landlocked amongst them (Article 82). As yet, no State is exploiting minerals on its continental shelf beyond 200nm, and the international rules about payment, and the distribution of funds need further elaborating before this Article could take effect.

**The High Seas**
UNCLOS applies its provisions on the High Seas to all parts of the sea that are not included in the EEZ, territorial sea, internal waters or archipelagic waters. The high seas are open to all States and no State exercises sovereignty there. The high seas include the waters over a coastal state’s continental shelf where that shelf extends beyond 200nm.

**The Area**
The Area is the term used in UNCLOS for the ocean floor, seabed and subsoil that is beyond the jurisdiction of any state. To put it another way, this is the part beyond the continental shelves of States.

Diagram: maritime zones in profile

Rights of other States within maritime zones

Ships of all states enjoy the right of innocent passage through archipelagic waters and the territorial sea. Innocent passage is defined in the Convention: generally speaking it should be continuous and expeditious although stopping and anchoring are included where they are incidental to ordinary navigation or necessary by force majeure or distress. Further, passage is innocent so long as it is not prejudicial to the peace, good order and security of the coastal state.

The ability to claim territorial seas of up to 12nm affects more than 100 straits used for international navigation, which could become entirely part of the territorial seas of the coastal states concerned. Hitherto, these straits had high seas corridors through them. To safeguard the rights of navigation, the right of transit passage through straits used for international navigation was included in UNCLOS. With some exceptions\(^{29}\) all ships and aircraft enjoy the right of transit passage which shall not be impeded. Transit passage means

\(^{29}\) Such as straits regulated by long standing international conventions.
the freedom of navigation and overflight solely for the purpose of continuous and expeditious transit of the strait between one part of the high seas or an EEZ and another part of the high seas or an EEZ, or for the purposes of entering or leaving a State bordering the strait.

Archipelagic states may also designate archipelagic sealanes, where the right of archipelagic sea lane passage, similar to transit passage in straits, applies.

Beyond the territorial sea, ships enjoy the right to freedom of navigation.

**How do the maritime zones relate to the Arctic?**

Principally, there is only a relatively small part of the Arctic that is not claimed by one or more coastal state as part of their EEZ or continental shelf, including beyond 200nm. Even so, the picture is not yet clear because more submissions to the Commission on the Limits of the Continental Shelf for shelves beyond 200nm are expected e.g. from Canada and from Denmark on behalf of Greenland. Also, while the United States is not a party to the Convention, it is unable to submit, but it has been conducting surveys in preparation for potential claims. When all possible claims are accounted for, there are likely to be some overlaps. UNCLOS provides guidance on the delimitation of maritime boundaries between states but it is open to interpretation and ultimately it is up to the parties to reach a negotiated agreement, or agree to be bound by some form of arbitration.

**Other disputes (not relating to overlapping claims)**

The way Canada applies rules over the use of the Northwest Passage for shipping first by (1) drawing straight baselines around all the northern islands resulting in all the waters to the landside of the baselines being internal; then (2) not accepting that the Northwest Passage is a route used for international navigation and is not therefore subject to transit rights; and finally, (3) using its interpretation of Article 234 on Ice Covered Areas, to apply its own regulations, including mandatory reporting and the requirement of permission for vessels to transit the area of the Northwest Passage.

Other states have disputed Canada’s claim to internal waters in (1) above. Others have also argued that the Northwest Passage is a strait used for international navigation giving ships the right of transit passage in (2) above. This requires coastal states wishing to apply vessel reporting and traffic schemes to submit their proposals to the International Maritime Organization for adoption. It also means that prior permission for transit would not be acceptable. Another state has also argued that requiring permission to transit does not meet the condition in Article 234 of having due regard to navigation in (3) above.

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30 This article gives coastal states the right to adopt and enforce non-discriminatory laws and regulations for the prevention and control of marine pollution from vessels in ice-covered areas, within the limits of their EEZ.
The apparent decrease of sea ice with climate change will reduce the geographical extent to which Article 234 can be used however as the sea ice cover remains extensive within the EEZ of Canada and Greenland it will be many more years before this article becomes redundant.

The way Russia has set out terms for navigation of the Northeast Passage has also been disputed by one state, for the same objections raised in relation to Canada’s Northeast Passage i.e. the drawing of straight baselines across Russia’s north coast including fringing islands, the lack of recognition of the right of transit passage in a strait used for international navigation and for the unilateral imposition of navigations regulations without submitting proposals to the International Maritime Organization for adoption. Part of Russia’s regulations includes restrictions on vessel class and the necessity to employ locally supplied ice-breakers and pilots.

**International Tribunal for the Law of the Sea**

States Parties to UNCLOS are obliged to settle disputes over the interpretation or application of UNCLOS by peaceful means in accordance with the Charter of the United Nations, whether by means of their own choice or by conciliation in accordance with Annex V to UNCLOS. If no settlement has been reached, recourse may be had to compulsory procedures entailing binding decisions. To this end all States may upon becoming party to UNCLOS select from a range of dispute settlement options: the International Tribunal for the Law of the Sea established under UNCLOS, the International Court of Justice, an arbitral tribunal constituted in accordance with UNCLOS or a special arbitral tribunal constituted for specific categories of disputes.

**Annex B: International agreements (or bodies with regulatory powers) of material relevance to Arctic debate**

*(Found under submission ARC0001)*

**Annex C: How the International Maritime Organization develops regulations applicable to shipping; and how states implement and enforce them**

As at August 2014, the International Maritime Organization (IMO) has 170 Member States. In addition, IMO meetings benefit from the contribution which is made by a wide range of observer delegations which have their own specialist knowledge and expertise. The IMO is the body which is best fitted to develop technical legislation applicable to the international shipping industry.

When legislation is developed in the International Maritime Organization it can either be in the form of an amendment to an existing instrument or it can be a new instrument.

If it is an amendment to the technical content of an existing instrument, then after the text has been adopted by the IMO it will, in the majority of cases, come into force after a specified number of months in accordance with the ‘tacit acceptance’ procedure – which
means that the amendment comes into force unless a specified proportion of the States which are Parties to the instrument notify IMO of their objection within a specified period. The specified periods vary from one IMO instrument to another.

If it is a new instrument, then when adopted by the IMO the instrument will include entry into force provisions which normally require that a specified number of States, representing a specified percentage of world merchant shipping by gross tonnage have ratified the instrument. The precise entry into force requirements periods vary from one IMO instrument to another.

One of the fundamental principles of the IMO is the ‘no more favourable treatment’ principle. This means that when a ship of any flag comes within the jurisdiction of a State which is a Party to one of the IMO instruments, that State will apply the provisions of the instrument to the ship, irrespective of whether the ship’s flag State is also a Party. In that way, the ships of States which have not become a Party to IMO instruments are treated in a manner which is no more favourable than the ships of States which have become a Party to them. This also ensures that application of instruments and their implementation is uniformly applied in what is a truly global transport sector.

States exercise control over ships through their powers as flag States, coastal States or port States under the terms of the United Nations Convention on the Law of the Sea. The primary responsibility for ensuring that a ship complies with international legislation applicable to shipping lies with the flag State (see UNCLOS, Article 217). However, the flag State is not the only state which can enforce such legislation.

When a ship calls at a port of a State which is not its flag State, the State in which the port is located has powers to enforce international legislation either in its capacity as a port State (see UNCLOS, Article 218) or as a coastal State (see UNCLOS, Article 220).

Many flag States exercise their jurisdiction very responsibly over the ships which fly their flag. Each ship must be surveyed by or on behalf of the flag State on an annual basis, and deficiencies can be identified as part of that process. Infringements which are observed while a ship is operating at sea can be reported to the flag State, and enforcement action can be taken as a result.

Nonetheless, the Port State Control system is a useful backstop. Port State Control is the inspection of foreign ships in national ports to verify that the condition of the ship and its equipment comply with the requirements of international regulations and that the ship is manned and operated in compliance with these rules.

Annex D: The Organisation for Security and Cooperation in Europe (OSCE)

1. Today’s Organisation of Security and Co-operation in Europe (OSCE) is the successor to the Conference on Security and Co-operation in Europe (CSCE), established in 1973 as a forum for East-West debate during the Détente phase of the Cold War. The changed environment in Europe in the 1990s gave the Organisation, renamed the OSCE in 1994, a role to deal with the conflicts and threats to regional security and stability resulting from the
break ups of the Soviet Union and Yugoslavia; and also to help former Soviet states and others in the transition to democracy.

2. The OSCE covers 57 participating States (pS), including the US and Canada, the EU, Russia and the former Soviet Union, the Western Balkans and Turkey. It offers a forum for political negotiations and decision-making on early warning, conflict prevention, crisis management and post-conflict rehabilitation, as well as the promotion of democratic development, good governance, media freedom, human rights and non-discrimination. It puts the political will of the participating States into practice through its unique network of 16 field operations. The OSCE employs about 450 staff in its primary institutions (mostly based in Vienna), as well as some 3,000 people in its field operations.

3. The OSCE’s comprehensive approach to security is based around three cross-cutting “dimensions” - politico-military (First) economic/environmental (Second) and human (Third). Participating States have adopted a series of political (not legally binding) commitments across the three dimensions – although the Conventional Arms Control (CONAC) regimes of four interlocking instruments which form the basis for conventional arms control and Confidence and Security Building Measures (CSBMs) across the Euro-Atlantic area: the Conventional Armed Forces in Europe (CFE) Treaty, the Open Skies Treaty and Article IV of the Dayton Peace Accords are legally binding. Decision-making is by consensus, so each State has an effective veto.

4. Each calendar year the OSCE is led by one participating State as the Chairmanship in Office (CiO). Switzerland hold the OSCE Chairmanship in 2014. The CiO has significant powers. It provides political leadership, has the power to initiate action, convene and appoint and has the ability to influence the course of negotiations. There are, however, important checks on these powers most notably the OSCE’s procedure of decision making by consensus.

OSCE and the Arctic

5. The Government is always looking at ways to ensure that UK contributions to the OSCE are used in the most effective and efficient ways to ensure value for money, to support modernisation, to maintain and sharpen focus in the OSCE on core issues and activities, and to shift resource within the OSCE in line with UK priorities. The Government is committed to making a full contribution to the work of the OSCE to protect and promote human rights, particularly where democracy remains fragile or basic human rights appear under threat. In 2014 OSCE work has been dominated by the Ukraine crisis and the Government believes the OSCE exists to tackle exactly this type of challenge and is the best placed international organisation to facilitate dialogue between Ukraine, Russia and pro-Russian separatists, and have worked closely with the US, the EU and the Swiss Chairmanship in particular to support its role. This includes the Trilateral Contact Group which facilitated the recent ceasefire agreement in Minsk, and the Special Monitoring Mission (SMM) which is active across Ukraine, making contacts and facilitating dialogue in eastern regions where it is difficult for others to do so.

6. The Government also remain strong supporters of the OSCE’s institutions: the Office for Democratic Institutions and Human Rights (ODIHR) - particularly its election observation
activities; the Representative on Freedom of the Media (RFOM); and the High Commissioner on National Minorities (HCNM). All of them play an important role in assisting participating States in the implementation of their OSCE commitments. To achieve all this the Government supports the need to limit expansion of the OSCE’s mandate and activities in certain areas; for example areas of the second (economic and environmental) dimension, where the UK has traditionally seen lower practical and political value and work would duplicate that of other organisations. The OSCE might not be best placed to assist directly in the Arctic, where other actors are active and more effective. Any decision to get involved with work in the Arctic would also need to be agreed by all 57 pS of the OSCE, which increases the tendency towards protracted decision making. It would also therefore need the full agreement of the eight Arctic States who are all pS of the OSCE.

29 September 2014
TUESDAY 16 DECEMBER 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Viscount Hanworth
Lord Hannay of Chiswick
Lord Hunt of Chesterton
Lord Moynihan
Baroness Neville-Jones
Lord Oxburgh
Lord Soley
Lord Tugendhat

Examination of Witnesses

Julian Brazier MP, Parliamentary Under-Secretary of State, MoD, Nick Gurr, Director for International Security Policy, MoD, Jane Rumble, Head of Polar Regions Department, FCO, and Henry Burgess, Deputy Head of Polar Regions Department, FCO

Q319 The Chairman: Minister and colleagues, I welcome you to this last session of the House of Lords Arctic Select Committee. We have been in process since June and this is our last session going through and getting clarity on government policy on the Arctic. You should have had a copy of all our Members’ interests, and you will have some idea of the sorts of questions we are going to ask. Just to make it clear again, it is very much up to you who, or which combination of you, answers which questions. We are certainly not expecting everybody to answer all the questions, or we might be here for quite a long time. I will ask each of you to introduce yourselves very briefly and then we will start the questions.
Julian Brazier MP: I am Julian Brazier, Parliamentary Under-Secretary and Minister for the Reserves in the Ministry of Defence.

Jane Rumble: Jane Rumble, head of the Polar Regions Department in the Foreign and Commonwealth Office.


Henry Burgess: Good morning. I am Henry Burgess, deputy head of the Polar Regions Department in the Foreign Office.

The Chairman: Thank you. Minister, we are particularly pleased to have you here this morning.

Julian Brazier MP: Thank you. James Duddridge MP, Minister for the Polar Regions, sends his apologies. You all know, I think, why he cannot be here today. With Jane here to answer the difficult questions, we hope we will be able to do what you need.

The Chairman: Good. I am sure it will work out fine. We offer Mr Duddridge our wishes for a swift recovery. Starting off more generally, one of the questions that we have particularly looked at as this Committee has undertaken its work is whether the UK’s position is sufficiently upfront. Maybe it does not have to be too robust, but it should be firm in articulating our interests in the Arctic. Could our approach be considered overly cautious when compared to the extensive and rapid engagement undertaken by states such as Singapore? One of the things that we particularly noted with new observer states to the Arctic Council is the gusto, one could say, with which they throw themselves into Arctic issues. Maybe in comparison, although we have been in the region and been involved in it for a long time, the United Kingdom does not seem quite so engaged in and focused on what we wish to do.
Julian Brazier MP: I will start on that and then hand over to Jane for the detailed answer to what is obviously an FCO question. You said that we have been there a long time, and the fact is that as a non-Arctic country but one that is close to the Arctic, we have been involved in the council from the very beginning, since 1996. We have taken part at every stage in the proceedings. We were the first country outside the region to produce its own Arctic vision. We have participated in almost all the conferences—we will come on to the security support side of it later on in the questions. We are not an Arctic country but are very much engaged, with some clearly defined objectives, which I will leave to Jane to spell out.

Jane Rumble: Thank you. That sets the framework. The UK has been involved in Arctic affairs for hundreds of years and was involved in the exploration of the Arctic. Ever since the inception of the Arctic Council, the UK has been a state observer, so in that sense we have demonstrated our broad spectrum of interests to the Arctic states over a long period of time. That said, it is fair to say that the new and increased enthusiasm from other state observers led us to feel that we needed to be much clearer about what the UK’s interests are. That is why we published the Arctic policy framework in 2013: in order to set it out in a much more structured way, to reinforce the support that we give to the governance arrangements of the Arctic and to recognise the sovereign jurisdiction of the Arctic states and how we can best work with them, while also recognising the increasing UK interest in things such as shipping, commerce, hydrocarbon extraction and energy security et cetera. We hope that we have been pretty upfront in the Arctic policy framework. We have said that it will be subject to review. It is a cross-government document, so we engage with different departments. We will continue to keep it updated.

You mentioned the new observer states and said that they look a bit more enthusiastic. To our minds, they are sort of playing catch-up to an extent in that the UK has been there for a
very long time and we have been able to identify what our key priorities and objectives are. We have built up those stable networks, whereas some of the activities that Singapore has been involved in have been about building up those networks, starting from a different position. I can understand that it looks, optically, like they are doing more than we are, but actually we have had a long period of activity. If we suddenly started to compete with these other non-Arctic states, it could jeopardise the policy issues that we want to be involved in just for PR purposes.

The Chairman: But is not perception pretty important in this area? I understand that those states are having to catch up to some degree, but does that not risk us being perceived by other Arctic Council states as being perhaps on the way down while they are on the way up? I say this seriously, because that is one of the themes that has come up, maybe not from all our witnesses by any means but from some of them, that the UK maybe needs to up its game again a little in an area that is subject to increasing international interest.

Jane Rumble: Yes, we have heard the same kind of comments, but when we look across the board at our relationships with Arctic states, they are pretty solid; they are not saying that the UK should do things differently. We often test them by saying, “We know that you have pressure from other state observers; how do you see the role of the UK?”. Without exception, they say, “The UK is the nearest neighbour, we have overlapping concerns”. Some of these new observer states have a more limited range of issues which they are interested in in the Arctic, whereas the UK has a broader spectrum, on which we are engaging across the board. Although the media will get enthusiastic to some extent about some of these new initiatives, we are not hearing from the Arctic states themselves that they want the UK to suddenly come up with big initiatives. For example, when the Foreign Secretary recorded a video message for the Arctic Circle event that we attended in Reykjavik
quite recently, in order to give a high-level ministerial message—hopefully the Committee has seen that, and if not we can give you the video recording of it—we had chatter on social media and from other people saying that the UK was pushing itself forward too much. We are always treading that fine line between engaging with the Arctic states on matters of mutual interest while not saying suddenly that we are more Arctic than one of the Arctic states.

Lord Addington: I was at the Arctic Circle conference event as a Member of the Committee. There was a perception that we had arrived for that conference trying to catch up for lost time, with interest. This was said to me over and over again: “Oh, you’re here in numbers this time, you’re doing something”. There was a distinct tone that we were rather late to the table. A bit of noise about what we are doing might be very appropriate. We have this broad range of interests, and although it is fine having something that is going along nicely and quietly below the surface, people need to know we are there. Particularly with all this talk about commercial activity and interests, we were being seen as coming late to things, even if we have had diplomatic arrangements. Those shall we say coffee-station discussions were definitely all of that tone.

Jane Rumble: It was only the second Arctic Circle meeting. The first one had been met with some resistance from some of the Arctic states, so we played the first one low-key to see how it would go. Some of the Arctic states did not attend at all, whereas for the second, the President of Iceland specifically invited us. I hear what you are saying—that we need to make sure that we are not perceived as not doing enough—but that was only the second Arctic Circle meeting.

Lord Addington: I am just saying that that was definitely the feeling. The commercial interests were probably saying this more than the Governments. Clearly some of this was
Foreign and Commonwealth Office and Ministry of Defence (Minister and Officials) – Oral evidence (QQ 319 – 330)

about commercial and business opportunities. The perception that we were interested came as a surprise, so clearly the preparatory work beforehand had not got the message through.

Jane Rumble: That is helpful feedback. On the Arctic policy framework, we are hearing that a lot of the other Arctic observer states intend to do something similar. In fact, Japan told us that it is doing something similar. In that sense, we are leading the pack.

Q320 Lord Hunt of Chesterton: I am sure you recognise, as the Committee does, the importance of the Arctic to many international organisations and UK organisations, one or two of which have observer status. In our discussions, we have been particularly interested in the many UN agencies such as the IMO, the meteorological office, UNEP and so on. We just wonder how the FCO is monitoring the engagement by these UN bodies in the Arctic and whether there could be an agenda item on some of these UN agencies and Arctic issues. That would be a way of perhaps ensuring that these wider UN bodies understood these Arctic issues without everybody having to join the Arctic Council.

Julian Brazier MP: I will just make an overall point and then leave Jane to make the detailed one. I think it is very important when you talk about these international bodies to emphasise what Jane has already said about the extent to which we are already dug in. I will give a couple of examples. You mentioned the IMO. Its headquarters, as you know, is a few hundred yards from here. On the hydrographic set-up, which Britain has 80% of, we are not just the world’s leaders; we effectively are the world’s hydrography. The IMO’s headquarters is not very far from Baroness Browning’s old constituency, and it obviously has a critical role in that part of the world, too. So we are already very heavily embedded in some of the areas that you mentioned before we start.

We touched a little on conferences. We have had two heavily Arctic-related conferences in this country just this year: the Arctic seminar at the International Festival for Business in Liverpool and the UKTI Arctic mining conference in March.
Jane Rumble: Thank you. Starting with whether or not we have sufficient oversight, that is the purpose of the cross-Whitehall Arctic network, which the FCO established and chairs: to make sure that we are bringing together all the different departments that have some element of Arctic activity and that we have a consistent approach. We have a cross-Whitehall network because of the way the UK departments are structured, and because we are not an Arctic state and do not link all our Arctic policies into a negotiating framework. The experts for shipping, for example, sit within the Department for Transport, within which they will develop Arctic and polar expertise to input into the Polar Shipping Code, and we rely to an extent on those departments to flag up Arctic interests to us. Equally, if we spot Arctic interests or hear things at the Arctic Council, we will go back to the departments. It is a two-way process.

You mentioned some of the bodies that are interested in the Arctic. UNCLOS—the United Nations Convention on the Law of the Sea—is topical today. Yesterday, Denmark put its latest submission in. The International Maritime Organization has just agreed the safety elements of the Polar Code, and its sub-committee on marine environment protection will look at the environmental elements of the Polar Code early next year. We will come on later to the OSPAR convention, which looks at the protection of the north-east Atlantic and is discussing marine protection in the Arctic area.

On the United Nations and its framework on climate change, its decision-making arguably has almost the biggest impact on the Arctic in terms of future climate change. The Convention on the International Trade in Endangered Species looks at polar bears, the international whaling convention is looking at whales in the Arctic, and there are others that we have listed to the Committee that have interests in the Arctic. The UN bodies that you
mentioned have very specific policy issues, and their having an Arctic component has been very much welcomed, but there is nervousness among the Arctic states about the Arctic per se being a UN agenda item, because of the impact that that would have on the Arctic Council and the arrangements that it has developed itself, and because the state observers have an interest in the Arctic and are engaging in that process, rather than it getting swamped in the UN—

**Lord Hunt of Chesterton:** The WMO has regional areas. They all have regional areas. All these regional areas—zoom—connect to the parties; there is the Asia, the America, the Europe. That is why the whole UN traditional regional breakdown breaks down in the Arctic, which is why it seemed to me that the Arctic Council has a very valuable role in, as it were, helping the UN bodies to have a sensible allocation of responsibilities in the Arctic. I just wonder whether the Arctic Council has a global role in that respect, because the UN system gets into a muddle when all these regional areas converge because of geography.

**Jane Rumble:** Sorry, I misunderstood your question. Yes, I agree: the Arctic Council does have a role to play. There is a process going on at the moment with the Convention on Biological Diversity doing ecosystem assessments around the world. It is called IPBES—and I cannot remember what that stands for. At the moment they are looking at the Arctic from Asia, America and Europe, so there is a recognition that they need to engage with the Arctic Council to look at the Arctic as a region.

**Lord Hunt of Chesterton:** Okay. Thank you.

**Lord Hannay of Chiswick:** Just following up this point, I am sure you are well aware that the UN cannot be relied upon to co-ordinate itself. All these disparate bodies, which are agencies or bits of the UN, are well known to be badly co-ordinated. Indeed, quite a lot of them spend their lives resisting co-ordination by anyone else—the usual turf-fight thing.
These are the questions that we have come up against. First, does the UK co-ordinate, not just monitor, its policies on Arctic issues in all these bodies that it sends representatives to?

Secondly, is the UK trying to press the UN to be a bit better co-ordinated than it naturally is?

Julian Brazier MP: I think I will let Jane answer that, but I would just make one overarching point; the fact that last year we set out such a clear vision, which cut across quite a number of departments, partially answers your question. I will just make one other point, if I may, as a House of Commons Minister addressing a House of Lords Committee. One of the advantages of your slightly less formal Committee structure in the House of Lords is that it provides a very positive forum in which you can discuss these cross-cutting issues much more easily than our Committees at the other end of the House can.

Over to you, Jane, for a detailed answer.

Jane Rumble: Thank you. On your first question about co-ordinating the policies, that is the live challenge, basically; that is what we have been trying to do. I guess you could argue that we have had some hits and some misses. To go back through some of the ones that I just mentioned, on the Polar Shipping Code, for example, we facilitated contact between the Maritime Coastguard Agency, which led on this process, and the British Antarctic Survey so that we could make sure that we had the science on the ice changes in the Polar Regions to inform the discussion that was going on with shipping while also engaging with the Department for Transport. So we have worked with departments. They are very much in the lead on the technicality of the policy issues, but they have used the cross-Whitehall network as a means of reaching out to others just to check that there is no overlap. Just last week we had a meeting—this is prompted partly by your final question about OSPAR—with the Department for Environment, Food and Rural Affairs, alongside Foreign Office legal advisers and those who are dealing with the UN on issues relating to marine resources in areas
Foreign and Commonwealth Office and Ministry of Defence (Minister and Officials) – Oral evidence (QQ 319 – 330)

beyond national jurisdiction, which is relevant to the marine protection debate. So, yes, that is definitely the live challenge.

The much broader question about what we are doing to improve the UN is a general question to the international organisations department in the Foreign Office, which spends a lot of time talking about improving, streamlining and making the UN more efficient. Again, that is a very live issue.

**Lord Hannay of Chiswick:** But you make an input into that from your Polar Regions Department. If you thought that one bit of the UN was acting in a way that was contradictory to another bit of the UN in the impact of its policies in the Arctic, you would speak up.

**Jane Rumble:** We would, yes. I cannot think of an example where we have needed to, but yes, we would.

**Lord Moynihan:** Following on from Lord Hannay’s question, I do not think it would be unreasonable to summarise your answer just now as one of impressive engagement, although Members of the Committee would probably feel that a lot more could be done in that context, but of somewhat opaque co-ordination. Is there not a case for a UK ambassador to the Arctic to become a focal point for UK interests?

**Julian Brazier MP:** Again, I am going to let Jane answer that fully. One thought that I just put to you is that this arrangement is working rather well. Lord Hannay obviously has absolutely enormous experience of the United Nations, but if you look around the world this is one of the regions that is working quite well. It has a council with the eight Arctic countries engaged, and of the many countries engaged as observers we were one of the first. Obviously we are going to start to come to some of the defence questions later. I must not anticipate those, except to say that while there are tensions there are noticeably fewer
tensions than there are in some of the other areas, with Russia and so on. This does appear to work quite well at the moment. Jane, would you like to give more detail?

Jane Rumble: On the question of whether the UK should have an Arctic ambassador, that is something that we have considered over many years. We have come to the conclusion “probably not”, in the sense that at the moment I, as head of the Polar Regions Department, have ambassador rank technically, so I can engage with senior Arctic officials and the Arctic ambassadors across the Arctic states. Each of the Arctic states has quite recently generated special envoys, or Special Representatives, the US being the most recent to do so. These act like Sherpas in engaging in Arctic issues between the Arctic states. Among the non-Arctic states that have done this, France appointed a former Prime Minister as a Special Representative, and Singapore has a Special Representative. Our assessment is that that has not necessarily had the impact that the Governments of those countries might want to have.

Lord Moynihan: In what sense?

Jane Rumble: In the sense that the Special Representatives have not necessarily been across all the detail—detail which the French Government, for example, have been trying to engage with the Arctic states on—and they do not have an ‘in’ to deal with the Arctic state ambassadors; they are just sort of separate representatives. So we have not necessarily seen that as the most successful way of engaging at this stage, but it is under constant review. If there was a forum where the non-Arctic state Special Representatives were dealing with the Arctic state Special Representatives, we would need to have an ambassador, but at this stage we do not think it would take us any further forward.

Q321 Lord Oxburgh: This is mostly for the FCO, and really comes down to Arctic Council nitty-gritty. I take it that among this plethora of Arctic organisations the FCO regards the
Arctic Council as the central one with which we engage. [Jane Rumble nodded.] It has six working groups and four taskforces, and we are clear that this is where the basic work is done on Arctic matters rather than in the council itself. I really have four specific questions on these. The first is who decides which taskforces or working groups are going to be involved. The second is who decides who goes. The third is: who do they report to when they come back, and how are those reports co-ordinated? Finally, do we involve the Government Chief Scientific Adviser, because nearly all these taskforces have a very important scientific import?

Jane Rumble: Thank you. In terms of who decides which ones we are involved in, to an extent it is a role for the Foreign Office, because—

Lord Oxburgh: So you decide?

Jane Rumble: To an extent. The Polar Regions Department represents the UK at the Arctic Council, so quite often we are the first to hear about the new proposals for the establishment of taskforces, to see the agendas and the working plans of the working groups, so we will do kind of a scan. But then we present that to the cross-government Arctic network to test whether people agree. Occasionally some views will differ from our initial assessment, so there will be a discussion about which ones we will be involved in.

On the question of who goes, sometimes it is quite obvious in that we will task a bit of the UK Government. If it very obviously relates to shipping, we will ring up the Maritime and Coastguard Agency and say, “You need to field this one”. If it is scientific input, we engage with the Arctic office of the Natural Environment Research Council, which has facilitated individual scientists or people with particular interests out of its base in the British Antarctic Survey. So it has determined which scientist is best placed to go, but we will have a discussion about whether it is a science matter and therefore should be an independent scientist, or whether it is a government matter and therefore should be a department, an agency or a non-departmental public body of government.
Lord Oxburgh: Sorry, but just to interrupt for a second before we move on, there will be a line to take at these meetings. Are these individuals, who may be somewhat remote from your desk, given a line to take? Are they told explicitly what the UK’s interests are?

Jane Rumble: If it is science, then no, because we feel that that would prejudice their scientific input. If it is just pure science, we say, “The Arctic Council wants to look at black carbon”, or methane or UV, and they will go and engage and report back to us. If it relates particularly to government policy and a government representative is going, it is sort of them setting the line to take. As you know, the Maritime and Coastguard Agency is responsible for global shipping, in which the Arctic will be one element, so we will discuss that if necessary but largely farm it out. We obviously make sure that they understand the Arctic Council, the overview and the UK’s position within the Arctic. The Arctic policy framework has helped us to provide that necessary briefing, but we do not lead on all policy from the FCO.

On the question of who they report to, that depends on who they are. To be honest, if they are scientists we do not necessarily see the reports in the Foreign Office. I think we would be a bit overwhelmed if we saw all the discussions about co-ordinating science across the board on the ozone, on UV or whatever. We obviously get a sense that they went and came back okay, and whether they thought it was a good thing, but it is not the kind of detail that we would look at. The Arctic office would keep an overview of that and disseminate it to other interested scientists. The science network will engage itself. If it is a government-related issue then, again, if they are going from an agency or a part of government they will report into that agency or part of government. We will likely get copied in on that so that we can keep an overview of the UK’s engagement and whether it has triggered any issues that others need to look at. Certainly in recent years, attendance at some of the taskforces
and working groups have quite often been through the Foreign Office’s Science and Innovation Network, which feeds up into the chief scientist’s office. They will do a report, which will go equally to us and to the Government Office for Science, on where things have got to.

**Lord Oxburgh:** Sorry to interrupt again, but what you are describing seems to be a pretty reactive system rather than a proactive system. Would that be a fair description?

**Jane Rumble:** I suppose the proactive bit comes at the start when we decide who is going to attend.

**Lord Oxburgh:** Sure, but then what happens? Do they just go and see what happens?

**Jane Rumble:** I suppose it depends on whether there is something that we particularly want to change. Again, with the science meetings, it is quite often an assessment with a meeting of scientists to determine what we know and do not know, and what needs to happen next. From that they will grow into collaborations and potentially submit for more science grants. If it is a policy discussion, yes, we will have had a discussion about what exactly this is about and what you therefore want to go and achieve. At the heart of all these things is the question: what would be the point of the UK going? We just cannot attend every single meeting.

**Lord Oxburgh:** So the interface between science and policy happens where, in your office?

**Jane Rumble:** Again, it depends on the subject matter. If it is generally speaking then it can come through us, or it may specifically relate to an issue that feeds into a policy department. If it is to do with methane and black carbon, for example, that would feed directly into Defra.

**Lord Hannay of Chiswick:** Does the issue of resources ever come up in this discussion of whether we should be represented? Do you ever have agencies that say simply, “Well, we
Foreign and Commonwealth Office and Ministry of Defence (Minister and Officials) – Oral evidence (QQ 319 – 330)

can’t afford it and don’t think it is a very high priority for us, so if you want to do it you had better send somebody.”?

Jane Rumble: Yes, all the time. The balance of resources and priority is there all the time.

The Chairman: I want to be clear on these things. We will let Lord Oxburgh come back.

Lord Oxburgh: The answer would be relevant to this. Do you involve the Government Chief Scientific Adviser? I see a great lack of co-ordination on the science side here, which the CSA’s office could do something about, so does that happen?

Jane Rumble: It is beginning to. Having involved the Science and Innovation Network across the posts in some emerging taskforces and so on, that is feeding into that process. For example, the chief scientist is in a meeting tomorrow at the Japanese embassy to discuss what we might do on Arctic collaboration as part of a broader agenda. So yes, feeding up into the science is an area of development.

Lord Hannay of Chiswick: Can we go back to the resources issue, because we just scratched the surface of it? I suspect it is fairly prominent in all this allocation of who goes where. In each case, you surely end up having to decide whose budget the cost of going there falls on. Presumably some of these more outlying specialist people and agencies, who are not flush with cash, simply say, “This is not a very high priority for us, but if the Foreign Office thinks that it is, you had better send somebody”. You will appreciate that if you confirm that is the case, it is not a very satisfactory way of determining British government priorities.

Julian Brazier MP: Can I break in for a second? We set out the vision last year. Would you forgive me, Lord Chairman, if I just read out the three limbs of the policy framework against which these decisions are made, whether on the resourcing line to take or whatever? They are very brief. The first is to have, “an Arctic that is safe and secure; well governed in conjunction with indigenous peoples and in line with international law”; secondly, and
Foreign and Commonwealth Office and Ministry of Defence (Minister and Officials) – Oral evidence (QQ 319 – 330)
specifically relevant to the questions here, to have an Arctic, “where policies are developed on the basis of sound science with full regard to the environment”; thirdly, to have a region, “where only responsible development takes place”. By clearly setting out last autumn exactly what our priorities were within what are inevitably extremely finite resources, particularly at the moment, there is a framework by which the FCO in the centre can determine how much can be committed to it and so on. Jane, I do not know whether you want to develop that further, but I thought that it would be helpful.

**Lord Oxburgh:** But are there government departments that might not have signed up to that framework? This is the question that Lord Hannay was pursuing.

**Julian Brazier MP:** Jane has given you a fairly frank answer already. Departments do say from time to time that they are pressed for resources in providing places. It is the job of her team within FCO to make sure that at these various conferences—and we have a very good record of attending them and playing a part in them—we field the appropriate people.

**Lord Hannay of Chiswick:** What you say is very helpful, but we are probing to find out whether we really are attending all the taskforces and working groups which it is in Britain’s interests to attend, or whether you have to have a triage imposed on you by the resources of the department or agency that has to send somebody and the Foreign Office, if they turn to you and say, “We are not sending them at our expense, but if you would like to pay for it, of course we will send somebody”. We are trying to find out whether the resources being devoted to staffing all these activities are sufficient or not.

**The Chairman:** The heart of it is exactly that, Ms Rumble, but given that there is an issue about resources—and clearly as parliamentarians we understand the resource issues in the United Kingdom at the minute—does it mean that every time we come up to a thing that has to be attended, a long negotiation takes up huge amounts of time and probably lands
up with a suboptimal solution, so that the right person may not always go to the right meetings or we do not manage to attend some of the meetings we want to? We are trying to find out a practical indication of this in the hope that we can be helpful in trying to push for a solution to it.

Jane Rumble: Yes. We are treading a fine line on resource issues. I think it fair to say that in any discussion about what we are going to contribute to we always weigh up the value for money—what we would expect to achieve and how important it is for the UK. I cannot think of an example where we felt that we ought to go and have not managed to resolve that. But we have increasingly been using the Science and Innovation Network as a creative way of reducing the resource burden, bearing in mind that quite a lot of these meetings are in remote places in the Arctic. Attending them from Foreign Office posts has actually been quite useful, as has having a science and innovation expert who already comes from a science background and is connected into other government departments. That is not to say that I do not foresee this being a constant challenge and it simply getting harder to attend some of these meetings. At the moment, I could not honestly say that there was a point where we have not been to a meeting but ought to have been. Some of the Arctic states say, “You should come along more often”, but you do not necessarily have to be there at every meeting to make sure that your interests are not prejudiced. In some ways, you might argue that that is being a bit reactive because we are simply checking that there is no problem. If we had endless amounts of money, I am sure that lots of scientists across university sectors in the UK would love to go and engage in doing more science in the Arctic. But we have not identified that as being prejudicial to UK interests—
Lord Hannay of Chiswick: It is not so much being reactive as being very defensive, because you are defining attendance at these meetings as ones that you have to go to in order to protect our interests. What about the ones we ought to be at to promote our interests?

Jane Rumble: I would say that protection and promotion are similar thinking processes. Do we have something particular that we want to pursue? Is there something that we can add? Is there something that we need to keep an eye on? Those are the three questions that we would think about when determining whether we should be attending.

Julian Brazier MP: If I could make two overarching points, the first is that it would be very helpful to us—and I am not trying to play the politician at all, but a number of Members of the Committee are obviously very well networked on this—if you could give some examples of conferences where you felt that we were underrepresented or had missed tricks.

The Chairman: Perhaps I could come on to that. I want to close this down because we need to move on. Lord Oxburgh has asked some excellent questions—

Lord Oxburgh: Could I just ask one more excellent question?

The Chairman: How could I resist, as long as it is brief? I need to follow up on this issue.

Lord Oxburgh: Committee dynamics are very important; it is also important to know what other countries are doing. But if we are the only country that is there from time to time at a particular committee, our position is weak. Do you know whether other countries are represented by different individuals at different times, and only represented occasionally? That makes a great deal of difference, and in deciding how we implement our strategy you need to have that information.

The Chairman: Can I follow that up with a supplementary myself? You will know that we have had from the Arctic Council the attendances of UK representatives over an 18-month period, from June 2013 to the end of last month. In that time, it is interesting to note that
Foreign and Commonwealth Office and Ministry of Defence (Minister and Officials) – Oral evidence (QQ 319 – 330)

we have attended only two meetings of the working groups but seven meetings of the various taskforces. If I were looking at this, and you will know more about this than I do, that would slightly look like a random attendance. With the taskforces, if we were interested in an ongoing issue—there is certainly one of those where we have attended three out of four times—should we not concentrate on particular areas and make sure that we always attended those taskforces? Surely there is a momentum in them or an important corporate history to them, so that to be effective you cannot dip in and out of them. To follow on from Lord Oxburgh’s question, we are concerned about that pattern of attendance.

Jane Rumble: In the sense of how the other state observers attend, we are in a similar pattern. There is a lot of attendance from the local embassies, which is similar to the way we have been doing it, but we have increasingly been doing it through the Science and Innovation Network—again, that is to build that kind of established network as opposed to having the latest second secretary, or whoever. We are acting in a similar way. The role of this is to see where our interests lie or where we have particular contributions to make. The working groups have an ongoing role in disseminating assessments, looking at the science and then identifying what should be advised to the senior Arctic officials. We have not necessarily found the working groups to be the best places for UK expertise to engage. There is a level below that with the scientific assessments, where we have been engaging much more: recent examples have been on ocean acidification, methane and black carbon. Those then feed into the working group, which disseminates them into what will then be given to the senior Arctic officials.

One of the ways in which we keep abreast of that is that I will speak to the senior Arctic officials, who will identify what might be coming up on the agenda. We will go to the senior Arctic officials’ meeting, so the working groups have not necessarily always been the priority
Foreign and Commonwealth Office and Ministry of Defence (Minister and Officials) – Oral evidence (QQ 319 – 330)

unless there is a very long-standing agenda item that we are interested in. With the PAME and CAFF working groups we have seen much longer-term interests, whereas emergency preparedness and response is very much about the specific responses of the Arctic states. We have not necessarily seen where we could add value into that working group.

In the taskforces, as you have seen, we have definitely been involved in each of them because they are a slightly newer breed of Arctic Council group. They have been looking at where they might move to new binding agreements, so we would have gone to all the taskforces on the scientific discussions, but with the first one we were only invited three days before it happened. We did not have much time to sort that out, but we have definitely been attending and that will continue under the US chairmanship, which will keep abreast of the black carbon and methane working group. We have been going to the Task Forces at the point where they look at meaty activities rather than the first meetings, which tend to be about agreeing the terms of reference and posturing. Again, we have been identifying where the priorities are and where we can best feed into that process.

Q322 Lord Soley: This is for Miss Rumble again, I am afraid. All the questions so far come together in this one in a sense. Everybody I have talked to and who we have talked to as a Committee conclude that the Arctic Council is a very important organisation and is evolving. I am sure that the FCO agrees with that assessment—do tell me if it does not, but I think it does. I suppose what troubles me, which comes out of the some of the previous answers, is whether we have a strategy towards the Arctic Council. Do we see what this organisation is likely to look like and in what form it is likely to be organised in five, 10 or 20 years’ time? In other words: are we thinking ahead of it? Your answer to Lord Moynihan on this was quite interesting when he asked about the ambassador. You said, “We have been thinking about this for many years and we have decided probably not”. That made me think that maybe in a year or two’s time we could ask the same question and hear, “We have been thinking about this for many years and we have decided probably yes”. I wonder about the strategy here. What is our idea of our involvement in the Arctic Council and how it is going to
develop? It is a big question but a rather important one if we are not just to react to events as they happen, which is what some of the questions have been picking up.

**Jane Rumble:** We agree that it is evolving, both in the sense of the breadth of the issues that it is looking at and in the way it structures and organises itself. It has quite a new secretariat, it is increasingly using task forces and it has agreed in recent years to legally binding agreements under its auspices between the Arctic states. We definitely think it is evolving, which is partly why I am trying to give the impression that we want to evolve with it. However, I do not want to give a definitive answer to some of these things, because it will depend. We obviously need to keep a watching brief and to be able to react.

In terms of where we would like to see it go, we very much welcome the establishment of the secretariat, which we think will be very helpful. We have struggled in the past with knowing exactly what is going on; the secretariat is very useful as a one-stop shop for where the meetings are taking place, what the agenda is et cetera. In the past, each of the working groups had a separate website that you needed to check on, and not everything was necessarily as co-ordinated as it is now, so we very much welcome that.

In terms of the UK’s involvement, we have consistently stated that we do not want to impose any changes on the Arctic Council. The body has been very carefully established to take into account the Permanent Participants and their unique role, and we have been very conscious of not overwhelming that relationship by having lots and lots of state observers recognised. We absolutely do not foresee the UK diminishing its interests. We see the UK continuing to be involved and having extremely strong bilateral relations with each of the Arctic states but also engaging with them multilaterally.

**Lord Soley:** I accept that the secretariat is an important step forward that will be critical to this, and that there are areas—science is obviously one—where we have a big contribution,
but there are other areas too. A lot of the developments are likely to be legal, such as for example legal agreements of various types, and one of the strengths of the United Kingdom is in legal structures, including international ones. Are you thinking in advance about that? What sort of legal structures will the Arctic Council be looking at in five years’ time? Could we offer a lead on that? I am sure you are right that we cannot tell the Arctic Council what to do—it would be a terrible mistake and would not work—but we have skills that we could bring to the table. We could start talking about aspects of international law, for example, which are terribly important in the development of the Arctic Council.

Jane Rumble: Yes, absolutely, and that is part of what we do, not necessarily in the formal, structured Arctic Council meetings but more relating to the different policies on which we feel there need to be further embellished rules and policies. The legal framework of the Arctic is enshrined in the UN law of the sea convention, but we foresee that there will need to be new agreements relating to fisheries—for example a new regional fisheries management organisation or a regional seas agreement—so we have been talking to the different states. But when you look at the Arctic states, we have natural affinity with and are more likely to agree with some of those states than others. The Arctic Council by definition is a consensus-making body, so it will talk about things where it feels that it has a reasonable chance of consensus. A whole range of activity happens before that, bilaterally or within other international agreements, to identify what needs to happen in the Arctic before it will necessarily get picked up publicly by the Arctic Council.

Lord Soley: A final quick question, if I can, although a fairly big one in implication. What would you say if I were to ask you whether you think we have a strategy towards the Arctic Council that thinks ahead or that we are just reactive?
Jane Rumble: I cannot use the word “strategy” because the Arctic states would be nervous about us saying that we have a strategy: hence, we have an Arctic policy framework. We have strategies in different policy areas. For example, we have a very clear strategy for climate change, which has a strong Arctic element, and a clear strategy for the safety of shipping, which also has a clear Arctic element. You can argue that the Government look at things in silos, but because the UK is not an Arctic state we are looking at policy areas with an Arctic element rather than having an overarching Arctic “strategy”. However, we do bring them altogether into the policy framework.

Lord Soley: A small strategy could be just as disturbing to the Arctic states as a big strategy.

The Chairman: Let us move on to defence issues. Viscount Hanworth.

Q323 Viscount Hanworth: I come to the loss of Britain’s capacity for aerial maritime surveillance and aerial support of sea rescue operations, which has been a consequence of the demise of the Nimrod aircraft. I would like to ask for your views on this situation. Do we need to restore this capacity in view of the increase in maritime traffic in the region and in view of the military aspects that also seem to be of increasing importance? I am thinking of the increasing activity of the Russians in this area.

Julian Brazier MP: I think it is absolutely clear that this is something that the SDSR will look at next year very carefully. Despite losing the Nimrod, we have quite a number of other assets involved in search and rescue, including vessels, satellite capacity and, albeit not so much up in the Arctic, helicopters of a variety of different kinds. But this is certainly something that SDSR 2015 will look at.

Viscount Hanworth: We had to depend on the good will of our allies who were flying the missions from Lossiemouth when searching for a Russian submarine recently, I believe. Those were the US, the Canadians and the French. Can we realistically depend on their assistance in future or should we put something in place of our own?
Julian Brazier MP: So far that alliance has worked. We bring a lot of other things to the table within the alliance in a whole variety of different theatres and circumstances, but I am certain that the question you put will be looked at very carefully next year in the SDSR by whatever Government are in place then. That will clearly be one of the questions that will be looked at very centrally.

Viscount Hanworth: Does anyone else on the panel want to contribute a view on that?

Nick Gurr: I have just a few points in addition to those of the Minister. Nimrod’s primary role was anti-submarine warfare rather than search and rescue, and it was actually quite unusual for Nimrod aircraft to be deployed outside the UK region for search and rescue purposes. The loss of Nimrod has not opened up a problem in search and rescue capability in the Arctic or near-Arctic. As the Minister has said, we have other assets that are capable of operating in the region, such as ships like HMS “Scott”, the survey ship. C-130 aircraft have a limited surveillance capability. They are not as sophisticated as Nimrod in that regard but they do provide a capability. As you yourself have said, we have been able to depend on allies. Canada, Norway and the US in particular have been very helpful in helping to fill the gap, if you like, that has arisen as a result of the loss of the surveillance capability that the Nimrod had.

Lord Soley: There are, as has been indicated, two areas of concern. One is anti-submarine warfare and the other search and rescue. One of the things that we have heard from a number of witnesses has been that Britain could do more on the search and rescue side. We are a maritime nation and have a good record on it. Other countries that would normally rely on us—Denmark, for example—cannot really rely on us in the way they used to be able to when we had a greater capacity. How high in your list of priorities is this for the strategic defence review?
Julian Brazier MP: Well, it is above my pay grade to set out the priorities for next year’s SDSR. On the search and rescue point, as far as covering our own coastline is concerned, the new arrangements that come in in about a year’s time will continue to provide very full coverage by helicopters. The occasional—it was only occasional—use of fixed-wing aircraft at much longer distances has been handicapped, but the main issue in relation to whether we get back to maritime reconnaissance or not is anti-submarine rather than search and rescue. That is overwhelmingly the central issue. It is no secret that it was one of the two or three most controversial aspects of the last SDSR. The then Secretary of State for Defence said on the record at one point that it was the single most difficult decision that he made in the process, but given the economic situation, some very difficult decision had to be taken. I am certain that this issue will be looked at very closely again, but as Nick Gurr has just said, the main focus for that decision will be on the anti-submarine side.

Lord Soley: While we understand that it must be on that, tourism is opening up in the Arctic. If you have a major incident with a tourist ship in the Arctic which would have been in range of British aircraft and we do not have any, what do you say?

Julian Brazier MP: There are eight Arctic countries. We are the closest of those who are not among the eight, but we are not an Arctic country. I accept, though, that our capability is less than it would have been fives years ago, Lord Soley.

The Chairman: A number of those tourists would be British citizens. We are probably a more adventurous nation than some others may be in our holidaymaking, and I suspect there will be quite a large contingent of British citizens on those vessels that Lord Soley refers to.

Lord Hannay of Chiswick: Would it make any difference to your decision-making if there were an agreement that tourist ships using the Arctic should pay some kind of levy to part-fund the possible need to rescue them?
Julian Brazier MP: That is an interesting thought, which I shall take away. I do not think I can give you an answer on that now. It was one of the most expensive programmes in government, and I would be exaggerating if I was to suggest that levies on tourists could pay a significant chunk of a planned maritime patrol, but there is an interesting underlying question there. Some countries do charge tourists for rescue. Kenya, for example, charges for mountaineering accidents. There is a long tradition there, but as far as I know we have never made a charge of any sort in this area, and I think it would be departing from standard practice.

Lord Hannay of Chiswick: This is an area where, above all, the tourists are extremely well off. Poor tourists are not going to the Arctic very much, I imagine.

Julian Brazier MP: I understand that, but I do not think it would be a Ministry of Defence decision whether or not we would charge.

Lord Hannay of Chiswick: I accept that.

Nick Gurr: I would just add one point. I do not think that would change the fundamental principle that it is the closest state that is responsible for the lead on search and rescue in a particular area, so in a search and rescue incident in the Arctic it would be the closest Arctic state. Our role would be to act in support of that state. We are able to do that now with the C-130 Hercules, which has a surveillance capability, as does the E-3 Sentry. We can make some contribution, albeit perhaps not as much as we were.

Lord Hannay of Chiswick: So you presumably hope that a British vessel or a vessel with a lot of British tourists on it does not get into trouble near Iceland.

Viscount Hanworth: Is there a likelihood of that?

Lord Hannay of Chiswick: It has no resources at all.

The Chairman: I would like Lord Tugendhat to come in first.
Lord Tugendhat: I was just going to follow up on the point that Lord Hannay made. It is surely not a question only of revenue raising and whether the revenue would be a significant amount to government. It is also that such a levy would be an encouragement to good behaviour on the part of those who might otherwise get involved in trouble.

Jane Rumble: Just briefly on the shipping question, I wanted to ensure that the Committee was aware of the work that we are doing to improve the safety of shipping in the Arctic. First, that is through the Polar Code, to make sure that ships operating there are better capable and have been ice-strengthened, and where necessary that they have ice pilots on board and are better navigating in those waters. We have also lobbied quite hard on the question of vessel planning to make sure that vessels are not operating in complete isolation. That is not necessarily agreed by all parties, but if a ship were going to the Antarctic, where you require a British permit to be there it is a requirement from the FCO in authorising the permit that this operation has been planned and that you would not be completely on your own. You would have ideas as to who would respond, rather than just phoning for government search and rescue services, which are as remote in the south as they are in the north. We are having that discussion with the Arctic states. The ships pay landing fees when they visit different countries and arguably, therefore, they would say that they are already contributing in some way. But we will put the point that you raise on whether there should be a specific levy to the Department for Transport, and I am sure that it will explain whether or not that would be workable.

Lord Hannay of Chiswick: I thought you were going to say, “They will explain why it is not workable”.

Jane Rumble: Sorry, I did not mean to say that. They will explain whether it is workable.
Julian Brazier MP: Just to come back to Lord Soley’s comments about legal structures, if you look at the way in which the civil law works in terms of people’s capacity to sue when things go wrong, in a previous world as a Back-Bencher I was quite heavily involved in investigating lobbying in that area. In fact, I had some support from the last Labour Government in making a modest change to the law. The fact is that it is a lot easier when things go wrong for organisations to get sued in this country, surprisingly, than it is in America or in a number of other jurisdictions where the more adventurous activities enjoy legal protections that they do not in this country. I do not think that British tourists would be the first to be causing problems in this area. That is not a prediction, just an observation on the framework.

The Chairman: Okay. Thank you, Minister.

Q324 Lord Addington: This is fairly straightforward and, I think, solely on the MoD’s ground. What interest does the UK have in Arctic security and, following on from that, what is the value of UK engagement in such groups as the Arctic Security Forces Roundtable and the Northern Group? Then, how does that engagement help the UK to achieve its objectives in the Arctic, and is this distinct from NATO-related activity?

Julian Brazier MP: We have been engaged from the beginning with the Arctic Security Forces Roundtable, which you just mentioned. I certainly do not want to sound complacent on the many issues and tensions that there are at the moment between the West and Russia—there is the situation in Ukraine and so on—but it is fair to say that although there are one or two concerning developments, which I will come to in a second, the background is that the Arctic is pretty stable compared to some other areas we are looking at. If I could give you a couple of quotes, the Norwegian Admiral Bruun-Hanssen said that it is, “probably the most stable area in the world”, while in a recent article the Economist commented, “All countries play by the rules. Legal norms are well established”. So it is important that we do
not get to a position where we are trying to fix something that ain’t broke. The fact remains, though, that the Russians have now set up their new Northern command. As in so many other areas, they have become much more active but are still very much participants, both in the council and in the security forces roundtable. So far, proper notices have been given and the various protocols are being observed, and so on. This does seem to be a forum that is really working.

You asked about NATO. Through NATO we continue to take a very considerable interest in the Arctic. We have regular exercises every year involving the Royal Marines in supporting elements in the far north, so we continue to have an Arctic-trained component there. That is reflected in the other two services, too. Mr Gurr mentioned that one of our hydrographic ships, HMS “Scott”, is ice-enabled, which gives us the capability to investigate there. We do regular missions through the Air Force and the Navy. Just south of the Arctic Circle, for example, we were one of the first to get involved with the aerial patrolling in the Baltic states during the period of tension there. I do not know whether there is a particular part of your question that you want to develop, but I hope that that gives you a flavour for the way in which we are engaged there.

**Lord Addington:** The main thrust of this is the difference between that activity and NATO, which is very interesting. On the Arctic Council et cetera, would it be fair to say for instance that not having a NATO element to some of the defence activity makes it more stable, because you are dealing with the Russians and they do not feel as threatened? I wonder if you could expand on that point.

**Julian Brazier MP:** Just for a moment, then I will hand over to Nick Gurr. Let us be clear that we are engaged in the forum and in the Arctic Security Forces Roundtable, as well as being in the original council as observers. NATO takes a close interest in this area. I am not sure
what you mean. Was your suggestion that we are somehow less threatening to Russia there?

Lord Addington: Yes, basically.

Julian Brazier MP: If you look at some other areas where there are very considerable issues with Russia, it would be hard to argue that they are all areas where Russia feels threatened. Clearly, this is an area where we feel that there is a positive relationship and that things are going well with—

Lord Addington: You mean there is less paranoia?

Julian Brazier MP: I am not going to use the word paranoia, but it is a forum where the relationship is going well between Russia and the other countries, the majority of which—not all of them, of course—are in NATO.

The Chairman: Can I just clarify whether we are saying that that forum still works as well as it did two years ago, or whenever, so that nothing has changed there and the participation of the Russian Federation is just as good?

Julian Brazier MP: Sorry, but it depends what you mean by “nothing has changed”. Things have certainly changed on the ground to the extent that Russia has set up a separate Arctic command, but, yes, the forum is still working as it did before. I think I ought to bring Mr Gurr in, because he is the expert on this.

Nick Gurr: There is quite a lot here, so perhaps I will start a bit further back. The defence interests in the Arctic are in pursuit of the national interests, so they are to do with trying to foster the maintenance of peace and security and co-operation between Arctic states, ensuring freedom of legal navigation in the Arctic, and having the capacity to deal with the management of the environment there. As the Minister said, and as the question alluded to,
there is also a specific defence obligation under Article 5 and other NATO articles for us to support NATO members that are Arctic states.

There are different views, even within NATO, on the extent to which individual countries want NATO to be involved in Arctic issues. Some countries are more enthusiastic than others about that. The Arctic Security Forces Roundtable has the advantage of bringing together all the Arctic states, not just those that are NATO members but those that are not. Clearly that includes Russia, but it also includes those that are neutral or non-aligned, such as Sweden and Finland. We have found that it has been possible to have constructive discussions about security issues within that forum. From a UK perspective, as an observer at that forum we are able both to develop a better understanding of the issues affecting Arctic security and to ensure that our voice is heard around that table. The forum has been working well. I think I am right in saying that the Russians were not invited to the last forum meeting, as a consequence of their actions in Ukraine and the response to them. But certainly up to that point it had all been working extremely constructively, as the Minister said. We will have to see how it moves forward from here.

Q325 Lord Hannay of Chiswick: Have any of the incursions identified by the European Leadership Network, which I am sure you are familiar with, been within the Arctic Circle?

Julian Brazier MP: Norway has seen a significant increase in incursions, but I do not know how many of them were above and below the Arctic line.

Lord Hannay of Chiswick: So it does cast a slight shadow of doubt on whether the forum is working that well if, first, the Russians did not come to the last meeting and, secondly, they are carrying out flights where they should not be.

Nick Gurr: There has been an increase in Russian incursions into air defence regions around NATO countries across the board.
The Chairman: We are going to come on to that in a bit. I want to bring in Lord Soley.

Lord Soley: My question has just been answered.

The Chairman: Okay, fine. So in terms of the ASFR are we saying that the fact that the Russian Federation was not there last time does not necessarily mean that it will not be in future, or does this look like a direction in which it is travelling?

Nick Gurr: I do not think we actually know that at the moment, Lord Chairman.

The Chairman: But is there a wish among the other participants to continue that co-operation despite what else is happening?

Nick Gurr: Yes.

Q326 Lord Hannay of Chiswick: We have been struck, looking at it in a purely theoretical way, by the fact that all the members of the Arctic Council are signatories of the Paris charter of 1990 and members of the OSCE. The question that we have been putting to various people and would now like to put to you is: does this common membership among the eight members of the Arctic Council, which includes the non-NATO members, have any relevance now, or could it have any relevance in future for the handling of security issues in the Arctic?

Julian Brazier MP: The short answer is that if you look at some other things that have happened—Georgia, Ukraine and so on—I am not sure I can give you a terribly hopeful response. Would the officials like to add anything?

Nick Gurr: The OSCE is about dispute resolution.

Lord Hannay of Chiswick: It is about rules. It is about laying down rules, which all the signatories have said they will abide by. Dispute resolution is a very small part of it, although it is very prominent in eastern Ukraine because the OSCE is mounting a monitoring mission there—without any help from the Russians incidentally. My question relates to the wider fact that you do not create the strains you would create if you say that NATO should be more active in the Arctic, which obviously immediately produces a negative Russian
reaction. My question is about the fact that they are all members and have all signed the Paris charter. Some people ought to try to read the Paris charter.

**Jane Rumble:** From my perspective, I think we agree that theoretically it could have a role in the Arctic if that becomes necessary. The issue at the moment is that there is no requirement or obvious reason for it to step in right now. If it was going to step in, as I understand it, all the members of the OSCE would have to agree to that, so all the Arctic states would have to agree. So never say never, but there is no reason now why it would need to engage; nor do we see one in the immediate short term.

**Lord Hannay of Chiswick:** That is a very helpful and clear response.

**The Chairman:** Lord Oxburgh, then I want to move on.

**Lord Oxburgh:** This is a quick point, going back to something that you mentioned briefly earlier. One of the principal hazards of navigation in the Arctic areas is that the maps are not very good. However, nearly all the Arctic Ocean is territorial waters of one country or another. Does the Royal Navy see itself as having any hydrographic mission in the Arctic?

**Julian Brazier MP:** I was at the Hydrographic Office a few weeks ago. This really is something that we lead the world in, and it is a much undervalued centre of excellence. As a tiny bit of background, the Hydrographic Office works from a combination of the certain amount of stuff that we get through our own hydrographic vessels and a much larger data feed from other people. The fact that one of our hydrographic vessels is ice-enabled gives us some capability up there. The short answer is that I do not think you can say it is a Navy mission—I really rely on Mr Gurr for a more detailed answer on this—but the UK Hydrographic Office is the leading authority.

**Lord Oxburgh:** We collect data and make excellent charts, but the question was really whether our vessels operate in Arctic waters to collect primary information.
Julian Brazier MP: Only to a very small extent.

Nick Gurr: The worldwide charts that are produced do cover the Arctic regions, and from time to time naval vessels operate in the northern waters in support of that charting. But I do not think it is a very frequent activity. The MoD requirement for those products has been relatively limited.

The Chairman: Lord Hunt, very briefly please.

Lord Hunt of Chesterton: Are we on question 7?

The Chairman: No we are not.

Lord Hunt of Chesterton: Some people having been jumping in on 7 already.

Q327 Baroness Browning: I wondered whether I could bring Mr Brazier back to the question that Lord Hannay raised about the European Leadership Network. What is the MoD take on this? The network reported 39 incidents in the last eight months, including near misses, “violations of national airspace, emergency scrambles, narrowly avoided mid-air collisions, close encounters at sea, simulated bombing attacks” stretching from the North Sea to the Baltic and Arctic regions as well as along the US coast. Surely, this is a testing of the responses of NATO and of Arctic countries. It is not just something that can be seen in isolation, can it, from what goes on in the Arctic Council? What is the MoD take on this?

Julian Brazier MP: I will let Mr Gurr follow up on some of the detail, but the Prime Minister, Foreign Secretary and Secretary of State for Defence have all been absolutely clear that we take these issues very seriously indeed. We have made the strongest possible comments. It is not just the violations that you mentioned but the invasion of Ukraine. I think we were one of the first three countries to get aircraft up into the Baltic States to take part in missions in response to violations of our NATO allies’ airspace there. It is a very serious problem right across the board.

To come back to the question that started earlier with Lord Addington about where our principal problems with the Russians lie, they have not principally lain inside the Arctic
Circle. If you look at the various dealings we have with Russia at the moment, there are areas where we are able to deal more easily with them. For example, they have been quite helpful with the negotiations on Iran, and there are areas where their interests are still seen to be engaged in broadly the same direction as ours. So far, against the frankly appalling background that you describe, the implications are that the polar region is an area where Russia still sees its interests as lying in a stable, rules-based structure of the sort that it is flagrantly ignoring in other places.

Baroness Browning: Thank you. Having heard that, can I move to Miss Rumble? When you came to the Committee last time, I think you were asked a similar question. How long can the Arctic be insulated from these geopolitical issues? While people are pressing on, is this the elephant in the room?

Jane Rumble: I suppose you could describe it like that. In any kind of multilateral forum there are underlying issues between countries on a range of different issues. This is obviously an extremely big one, but at this time, as the Minister said, Russia sees the Arctic as an area where it wants to continue engaging with its Arctic Council partners on areas of mutual co-operation where consensus can be built. It has not at this point led to a breakdown in the council or its work or structures, but as has just been described, it is obviously quite a live issue and it is being assessed very regularly.

The Chairman: This is a really naive question, but given that there are all these incursions going on, some of them within the territories of Arctic Council states if not actually in the Arctic, has the reason why this is all going on and how the harm from all these potential incursions that were outlined by Baroness Browning can be minimised been discussed at all at the Arctic Security Forces Round Table? Is it part of an agenda there or is it completely separate?
Julian Brazier MP: I am afraid that I cannot answer that question.

Jane Rumble: On the Round Table, I might defer to Nick. It is certainly not discussed in the Arctic Council.

The Chairman: Forget that I said Arctic Council. I understand that, but Arctic nations are involved because of the work that the Russian air force is doing at the minute and the other potential incursions. Is that an agenda item on the forum if the Russians are there?

Nick Gurr: I understand that it was not at the last meeting, but there has been considerable bilateral discussion about this between us and allies. I wonder whether it is worth presenting a little context to the Russian activity. There is absolutely no doubt that there has been an increase in Russian military activity over the last year or so. The number of Russian incursions into air defence regions of NATO member states has increased about threefold during that period. As the Minister said earlier on, there has been an increase in the Norwegian air defence region—not as big as three times, but there has been an increase. The Norwegians in particular have seen a change in the nature of some of the flights, so that rather than it being, if you like, routine training or reconnaissance flights going through, you have tended to see more instances of a number of aircraft conducting tactical types of manoeuvre. There has been a difference both in number and type. The area where we have seen the biggest increase in Russian activity has been the Baltic area, not the Arctic. A number of the incidents that Baroness Browning referred to were in that area. That is where the mock attacks and incursions of air space have occurred.

Julian Brazier MP: Just to emphasise, that is why Britain got aircraft up to the Baltic so early and why we have just been participating in a very long series of exercises stretching through Poland and up into the edge of the Baltic states. That is where the secondary focus of activity after Ukraine has been.
Q328 Lord Hunt of Chesterton: The Minister mentioned, when we were talking about aircraft, the role of submarines, which is very important. My question is really associated with the fact that there has been a lot of submarine activity both in the present and in the past. In the past, this led to a large amount of nuclear waste and old, rotting nuclear submarines. The MoD and others in the UK had a very extensive programme of collaboration to clean this up, because it leads to contamination of the whole of the Arctic area. I just wondered whether, first, this programme is continuing within MoD as part of its Arctic work. Is it funded into the future? Is it done in collaboration with the Arctic Council? I understand that this could be talked about in the Arctic Council, as it is a huge environment problem for the Arctic, or is it discussed solely in bilateral military circles?

Julian Brazier MP: On your first point, we certainly continue to take our responsibilities on nuclear waste very seriously. Does anybody know about the Arctic Council’s involvement?

Nick Gurr: No, I was aware of the programme that you referred to some years ago. I think the work is complete, but perhaps we could let you know.

Julian Brazier MP: We will write to you.

The Chairman: That would be very useful, thank you.

Lord Hunt of Chesterton: Quite a lot of Members of the House felt that one of the big issues for the Committee would be to understand what is happening about this stuff, because it has caused a lot of concern. But I understand it is a touchy issue in Arctic Council affairs.

Julian Brazier MP: It is worth remembering that the bulk of the submarines that we are talking about are Russian, but nevertheless we will give you a written answer.

Lord Hunt of Chesterton: Their waste goes everywhere.

Lord Soley: I have a brief question, which goes back to what I was talking about on our strategy towards the Arctic Council. It seems to me that if President Putin’s activities continue on their present course it is almost inconceivable that that will not impact on the Arctic Council over the coming years. I just wonder whether we are thinking ahead in that
Foreign and Commonwealth Office and Ministry of Defence (Minister and Officials) – Oral evidence (QQ 319 – 330)

way in both the Foreign Office and the Ministry of Defence. It will be affected if President Putin goes on doing what he is doing.

Julian Brazier MP: You may well be right, my Lord, but it is not for us to speculate. As to your question whether we are thinking about it, the short answer is that, yes, we are. In SDSR 2015, I am certain that we will look at it hard. We have already discussed the issue around maritime patrol aircraft. The fact that we have a programme of exercises in Norway and so on shows that we are committed there. Are there any detailed points that you would like to make, Nick?

Nick Gurr: No, other than that we talk all the time to our allies and partners about both Russian intentions and Russian capabilities in the military sphere. It is fair to say that the whole manner of our relationship with Russia across the board, not just in defence and security but in engagement, was relatively limited. But that is something that we are now considering across government and thinking about what the implications are likely to be over the next several years. As you hinted in your question, this does not feel to anybody like a blip in relations; it feels like an issue that we will have to manage for several years. Russia and the Arctic will be one aspect in our consideration of all that.

Q329 Lord Tugendhat: You will have seen the report in today’s newspapers about Denmark claiming the North Pole. I wondered whether HMG have a view on the future of the central Arctic Ocean. What involvement in discussions regarding the regulatory framework for the high seas in the Arctic Ocean have we had?

Julian Brazier MP: It comes back to science to some extent—the examination of continental shelves and so on. Jane, do you want to run with this?

Jane Rumble: The Danish submission is under the UN Convention on the Law of the Sea. Each coastal state is invited to submit information to the Commission on the Limits of the Continental Shelf, which is a UN-established body, to identify whether it has a claim to an
extended continental shelf. Every state gets a 200-nautical mile jurisdiction over the water column and the seabed and you can extend your rights to the seabed out to a complicated formula—I think that it is 350 nautical miles or 60 miles from the foot of the geological slope. That is what all the states have been involved in. Russia, Canada and Denmark have done it, as will the US, if it ratifies UNCLOS in future. The UK has done it for metropolitan UK and some of the overseas territories. It is an ongoing process. Because of the timeline under UNCLOS as to when you should do this—it says that you should do it within 10 years of ratification—Russia is on a much earlier timescale, so it submitted originally, including for the Arctic area, in 2004. It was then asked by the Commission on the Limits of the Continental Shelf to do further work, so it is doing that at the moment. Canada has recently submitted and so has Denmark; both ratified UNCLOS a bit later. Our view is that the United Nations process should be followed and that this expert committee should look at the submissions and determine whether the area under the North Pole is indeed continental shelf. The process that the UN has set up is not in fact to arbiter over disputed regions; the aim is to identify the outer limits of the continental shelf. Once that can be mapped, it will be up to relevant states who has jurisdiction over different bits of it. There is a long process to be gone through at this stage to identify whether the UN agrees with the submissions of Denmark and Russia and whether they can map the outer limits of the continental shelf. Subsequently, the negotiation will take place about who, therefore, will have jurisdiction over which bit.

**Lord Tugendhat:** So if I understand it correctly—I am not at all sure that I do—this is a move in a prolonged chess game rather than the striking démarche that it appeared when I read my *FT* at breakfast.
Jane Rumble: Yes. The information that Denmark has submitted will sit in New York in the United Nations for quite some time. The Commission on the Limits of the Continental Shelf has a phenomenal workload, so it will be quite some time before it determines whether it agrees with the Danish submission.

Lord Hannay of Chiswick: If I have understood your answers rightly, which seem to me to make entirely good sense, these submissions by Canada, Denmark and Russia will go into a slow, lengthy process while the law of the sea committee decides where the continental shelf ends. That decision on where the continental shelf ends crucially affects the size of the high seas element that remains if the sea ice melts. Is that not the case? It will eat up large amounts of that if these claims are sustained. My point is this: are we in a situation where the claims of these three countries will prevent any sensible handling of the high seas area in the middle, because nobody will agree how big it is or where it is?

Jane Rumble: There are two elements. The continental shelf element is over the rights to the seabed, so it is predominantly talking about mineral resources under the continental shelf.

Lord Hannay of Chiswick: And nothing to do with fisheries.

Jane Rumble: No. The high seas area is the water column and that is fixed. As a coastal state, you have out to 200 nautical miles; thereafter it is the high seas. The continental shelf discussion will not impact on shipping and fishing.

Lord Oxburgh: Can I just pursue that? The continental shelf is not necessarily fixed. You can define it purely in terms of water depth or you can look at changes in slope. You can make a good geological case for either of those. Is that accepted or clear, or will this be part of the area of disputation?
The Chairman: I do not want to spend too much time on this, as we have gone through it previously.

Jane Rumble: Okay. I hesitate to try to explain it to a geologist, but as I understand it the criteria by which the UN will make its decisions are very clear.

Q330 The Chairman: I would like to ask one question on the water column, which comes back to fisheries. We have had evidence from various nation states and organisations around the fisheries issue and I wonder whether the UK Government have a specific policy on this. As that area becomes more open to economic activities, particularly around fisheries and related ecosystems, what should happen there? Should we have a very precautionary approach? Should we have a sanctuary? Should we have no-take zones? Do the FCO and the Government have a view on that?

Jane Rumble: Yes, I suppose that there is a series of views. The first main view would be that the fisheries should only take place where there is a structured framework for the governance of fishing. We do not wish there to be no regulatory regime and for it to be just the high seas; we would want there to be some sort of regime, whether that should be a fisheries regime to enable fisheries or a prohibition of fisheries activities. The high seas area of the Arctic at the moment comes under two different areas. One area, north of Europe, is covered by the OSPAR convention—“OSPAR” is just a linkage of Oslo and Paris and does not stand for anything—and the North East Atlantic Fisheries Commission. OSPAR is considering whether there should be a marine protected area up in that triangle, if you like, from the North Pole downwards. The UK is actively working with other member states and various organisations to look at the scientific justification for that. In the area that is outside that triangle, at the moment it is just high seas and there is no regime. The UK’s preference for declaring marine protected areas would be under an Implementing Agreement under the United Nations Convention on the Law of the Sea. That is under negotiation at the moment under the UN framework, but we recognise that that will take quite a long time, so there is a
further discussion among the five coastal states around the Arctic as to whether there should be a moratorium on fishing activity in this region. We understand that the suggestion would be that they would agree that their boats would not fish this region but that they would all co-operate on science. We believe that they will come and discuss that with other major fishing nations. In that debate, the UK would feed in information on the marine protection element and, on the fisheries element, would be working with the EU. Our general view is that, where the science suggests that it would be useful and there is a scientific basis for it, protection should be given. The science for the Arctic is not yet there, so we very much support the idea that there should be more science activity. I think that we would be sympathetic towards a moratorium, but we have yet to see the exact detail, which we understand the five Arctic states are working up between themselves. We will look at that once it comes to us.

**Lord Hannay of Chiswick:** Am I right in saying that we do not accept that the five Arctic states can tell us what should happen in the high seas portion? It has to be agreed and we would be one of the parties that would need to agree with that, if it was to be regulated by some kind of international arrangement. Is that right?

**Jane Rumble:** That is right. We have made those representations to the Arctic littorals—the coastal states—and I think they well understand that they could not control this area on their own. The idea is that they want to show leadership. There are eight states in the Arctic Council and we are conscious that they may not share the same views; they may not yet be persuaded that this moratorium is the right way to go. So, yes, we are waiting to see the detail of it to consider.
The Chairman: Minister, Mr Gurr, Ms Rumble and Mr Burgess, thank you very much indeed for a very useful and excellent completion to our evidence sessions. We look forward to those extra bits of written evidence. I hereby bring the public part of the meeting to an end.
UK Government supplementary written evidence to the House of Lords Select Committee on the Arctic

1. The Government gave oral evidence to the Committee on 16 December 2014. This note sets out further written evidence on the UK’s engagement with the Arctic Council.

2. The UK’s nominated representative to the Arctic Council is based in the Polar Regions Department of the Foreign and Commonwealth Office.

3. As an observer to the Arctic Council, the UK receives notification of meetings of Ministers and Senior Arctic Officials from the Arctic Council Secretariat through its Arctic Council representative. The nominated representative also receives notification of meetings of the Working Groups directly from the Working Groups themselves and of Task Forces. The Foreign and Commonwealth Office, in consultation with other Government Departments and Government advisory bodies as appropriate, will make a judgement on attendance based on the UK interests at stake, practicability and value for money.

4. The costs of attendance by Government representatives are borne by their host Department or organisation. The Natural Environment Research Council’s Arctic Office will consider requests to send UK scientific expertise, either from the expert themselves or from the Arctic Council Working Groups, on a case-by-case basis and may fund their participation. The Annex to this evidence sets out the basic Arctic Council structure and how the UK engages with it.

5. Government representatives that attend Arctic Council meetings will report internally within Government on discussions. The UK does not publish reports of any proceedings of the Arctic Council as this is a prerogative of the Arctic Council. The Secretariat makes reports from most Arctic Council meetings available on the Arctic Council’s website.

6. The work plans of the Arctic Council Working Groups and terms of references of the Task Forces are set by the full members of the Arctic Council at Ministerial and Senior Arctic Official level. The Arctic Council’s Terms of Reference would allow for observers to propose projects through an Arctic State or a Permanent Participant. However, the UK, as an observer to the Council, could not co-chair a Task Force.

19 December 2014
Annex: Structure of the Arctic Council

Political meetings
High level political engagement; decision-making level that agrees Working Group work plans and approves or rejects reports and recommendations made by the Working Groups and Task Forces. Sets the strategic direction for the Arctic Council and agrees priorities. Foreign and Commonwealth Office’s Polar Regions Department has attended every biennial Ministerial and Senior Arctic Official meeting since the Arctic Council’s inception in 1996.

Working Groups
Each Working Group manages a portfolio of projects, which have been agreed by Senior Arctic Officials. Working Groups report progress to the Senior Arctic Officials. Working Groups sit on the science/policy interface, ensuring that any scientific messages from projects and assessments are fed into recommendations for the Senior Arctic Officials and Ministers; and monitor progress on the production of reports. UK engagement at Working Groups is increasingly undertaken by the Science and Innovation Network and from the FCO Post where the meetings are being held. Other branches of Government, such as the Met Office and the Joint Nature Conservation Council, have attended Working Groups in the past.

Task Forces
These are time-limited groups set up to address a particular issue on the instruction of the Ministers and Senior Arctic Officials. They report direct to Senior Arctic Officials. Task Forces are time-bound and deliver agreed outputs to Ministers, via the Senior Arctic Officials. Deliverables have included legally binding agreements (Search and Rescue and oil spill preparedness and response). Observers are not allowed to participate in Task Forces if they start negotiations on a legally binding agreement. The UK, through the Science and Innovation Network and FCO Posts overseas, has participated in all four Task Forces under the Canadian Chairmanship.

Workshops, conferences, individual project meetings and report writing
These feed in the science and evidence to the Arctic Council. They are coordinated by the Working Groups and are often led by specific subject Expert Groups, such as the Ocean Acidification Expert Group. Working Groups can issue ‘call for experts’ to participate on individual projects or approach observer countries directly with a request for expert participation. The UK, through the Natural Environment Research Council’s Arctic Office sources, coordinates and funds participation by UK scientists into these projects. Government advisory bodies, such as the Joint Nature Conservation Committee, also contribute.
The opinions expressed below represent my personal scientific views and do not represent those of NCAS, or the University of Leeds where I am based.

In my brief response I have only provided information that is relevant to the scientific questions relating to global warming and how this will affect the Arctic and what needs to be done now.

**Questions addressed.**

**Question 1.**
What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?

**Question 5.**
Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?

**Question 6.**
Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?

**Question 1.**

The main scientific issue I shall refer to is that global warming is melting the Arctic ice fields rapidly NOW.

![Image of Arctic Death spiral](https://example.com/arctic-death-spiral.png)

*Figure 1. The so-called “Arctic Death spiral”. Data is taken from NSIDC. The black curve is the September Ice Volume for the Arctic.*
Figures 1 and 2 indicate the change in Arctic Ice Extent over recent decades. Figure 1 indicates the decline in ice volume. The black curve gives the September ice volume and is the one of most concern. Figure 2 indicates the latest ice extent data.

My conjecture is that:
(a) the September Ice extent will become critical (< 1 million cu km) within the next few years. This is shown in Figure 1 and there is no reason to suggest that the last 30 year trend is being reversed.
(b) the “Atmospheric Meridional Heat Flux” which is the driving mechanism for the rapid Arctic ice melt and with a “good El-Nino”, there will be a downward drop in the Arctic ice volume. (Figure 1)
(c) the although the commonly used Arctic Ice extent (Figure 2) is useful, it does not include the rapid thinning of the ice sheet, and that is a critical feature largely ignored.

References:
1. Peter Wadhams presentation to the Royal Society, 22/09/2014 (this refers to the thinning of the ARCTIC ice)

Question 5.
million UKP per annum should be spent on looking at geoengineering and understanding climate change. No funding from the UK government has appeared. EPSRC fund a 3 million UKP project to look at the issue. Anyone who had any experience in the field was excluded from the sandpit bidding process (including the Shepherd ocean carbon sequestration application and the Marine cloud brightening group). The SPICE project, to inject Sulphur into the atmosphere was funded, a complete failure and total waste of UK taxpayers money, as was predicted by many atmospheric scientists and engineers who had experience in the atmosphere. This fiasco has damaged all experimental activity in this area and no other funding has been proposed. The world is moving into a period of rapid climate change. Other than some funding into adaptation and social sciences of climate change, the hard core science has been ignored. Measurements are needed; modelling is needed, and not just to those in the UK who have produced papers which basically review relevant theories. Bill Gates has funded more research in this area than any combined UK effort. MORE funding is urgently needed.

**Question 6.**

The UK is a world leader in atmospheric sciences. The scheme of geoengineering which I propose to be examined is “Marine Cloud Brightening”. The Latham, Salter, Gadian et al group, (see some of the publications below), is the group that I work with.

Marine stratocumulus clouds cover 30% of the oceans and 20% of the total surface. The albedo (reflectance) of these clouds is misrepresented by the climate models, both in area and in magnitude. A double CO2 scenario, is a warming of 4W/m2. The errors in the albedo of these clouds is ~ 10 W/m2. Scientifically, the reliance on the IPCC AR5 calculations on radiative balance is alarming in its omissions. Figure TS7 from the AR5 report is included below. I argue that the role of clouds in the flux calculation errors is crucial, but represents a basic and underlying error in the approach of a document produced by climate modellers on the changes to the climate. ALL the climate models have completely missed the rapid loss of Arctic Ice (which only has a small chance of being lost by 2050)

For 25 million UKP, we have a plan to test the role of marine stratocumulus in the planetary albedo (see Latham et al 2012 and 2008) where a proposal is based. We have an international team which could look at marine stratocumulus. My thesis is that mankind is rapidly geoengineering the planet with a massive CO2 experiment. We wish to examine the role of cloud droplet sizes in the albedo of the planet. If our non-invasive experiment works, then society will need to judge what to do next. However, the basic point is that the Arctic Ice is likely to disappear very shortly and MCB could buy time in the future if the worst forecasts are realised. The ARCTIC is the area which will be affected first and most. There are lots of complex theories as to why this is so, but I have not expounded them here.

Some recent relevant publications on Marine Cloud Brightening.

- Neukermans A; Cooper G; Foster J; Galbraith L; Jain S; Ormond B; Gadian A; Latham J (2014) Sub-micrometer salt aerosol production intended for marine cloud brightening, Atmospheric Research, 142, pp.158-170. doi: 10.1016/j.atmosres.2013.10.025
- Andrejczuk M; Gadian A; Blyth A (2014) Numerical simulations of stratocumulus cloud response to aerosol perturbation, Atmospheric Research, 140-141, pp.76-84. doi: 10.1016/j.atmosres.2014.01.006
I have several concerns regarding Figure TS7. Mainly that the importance of clouds in the system is totally misrepresented, and the “cloud” error bars are totally inadequate. Furthermore, methane is a very important greenhouse gas which has only been included as a small factor in the report. Similarly, the contribution to greenhouse warming by water...

Figure TS.7. (from AR5 IPCC report)

This figure is taken from the draft report. Radiative forcing of climate change. The horizontal bars indicate the level of uncertainty.

- Latham J; Bower K; Choularton T; Coe H; Connolly P; Cooper G; Craft T; Foster J; Gadian A; Galbraith L (2012) Marine cloud brightening, Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 370, pp.4217-4262. doi: 10.1098/rsta.2012.0086
- Gadian A; Blyth A; Latham J; Salter S; Stevens L (2009) Whitening the clouds, Planet Earth, pp.9-11.
- Latham J; Rasch P; Chen CC; Kettles L; Gadian A; Gettelman A; Morrison H; Bower K; Choularton T (2008) Global temperature stabilization via controlled albedo enhancement of low-level maritime clouds, PHILOS T R SOC A, 366, pp.3969-3987. doi: 10.1098/rsta.2008.0137
- (N.B. Latham Gadian et al, 2014) “ Regional Aspects of Marine Cloud Brightening), November 2014 in Phil Trans will be soon available)
vapour in the boundary layer although important has been underrepresented. The measurement of water vapour concentrations need to be improved and the critical meteorological processes better understood before such a diagram is complete. In the report there are caveats about the role of clouds etc, but this figure is the basic take home message on radiative balance.

*September 2014*
The Geological Society – Written evidence (ARC0031)

1. The Geological Society is the UK’s learned and professional body for geoscience, with more than 11,500 Fellows (members) worldwide. The Fellowship encompasses those working in industry, academia and government with a broad range of perspectives on policy-relevant science, and the Society is a leading communicator of this science to government bodies, those in education, and other non-technical audiences.

2. We have not attempted to answer all of the questions set out in the call for evidence. Our submission draws principally on the geoscience relating to potential development and protection of the Arctic, as well as the UK’s role in this process.

The Geology of the Arctic

3. A significant body of work has been developed on the geology of the Arctic, through investigation of what lies beneath the ice. With regard to oil and gas prospectivity, continental shelves are the principal area of interest, and the Arctic Ocean has the most extensive continental shelf area of any ocean basin. Approximately half of the area is made up of continental shelves and much of the seafloor in this area is less than 50m deep. These broad shelf areas are predominantly located off the coast of Russia.

4. A major Geological Society publication on Arctic Petroleum Geology (Memoir 35 – Spencer et al, 2011) brings together 50 papers authored by scientists from across the circum-Arctic nations, working in industry, academia and national geological surveys. It constituted a state-of-the-art assessment of Arctic geology; known hydrocarbon resources; prospectivity and potential for development of as yet unknown resources; and techniques for surveying, exploration and resource assessment in high latitudes. The publication builds on symposia held at the International Geological Congress (IGC33), Oslo, 2008, which focused particularly on Arctic geoscience – not just in relation to oil and gas, but also, for instance, to data from the Integrated Ocean Drilling Programme which provided new insights into the past role of the Arctic Ocean in the Earth’s climate system. If the committee wishes to consult this publication, we would be pleased to provide access.

Scientific Research in the Arctic

5. Melting of the sea ice and development of the Arctic, however undesirable, will provide new opportunities to investigate and study the sea bed, natural resources, shelf geology and the ecosystems associated with it. The current geoscientific database for the Arctic is weak, particularly with regards to regional seismic and wells. There is also still limited understanding and knowledge of the natural environment in polar regions. Comprehensive baseline studies should be carried out in the region ahead of any planned increase in activity so that any resultant impacts can be effectively monitored.
6. The UK has a strong basis for Arctic research, with initiatives such as the UK Arctic Research Station and the NERC Arctic Research programme positioning UK scientists to carry out any research enabled by the development of the Arctic. In terms of a research presence in the polar regions, the RRS James Clark Ross research ship currently conducts research for the British Antarctic Survey and is deployed in the sub-arctic region during the Antarctic summer. Whilst this has greatly helped research in the Arctic region, the RRS James Clark Ross has no ice-breaking capability and can only handle seasonal ice <2-3m. It was announced this year that the Government has earmarked ~£200 million for a new ship that will be ready for 2019. We understand that the new research ship is intended to replace two old ones, which will necessarily result in an overall reduction in the physical extent of research capacity. Much geoscience research is location-specific, and most data collection has to be carried out at site. This means that a reduction in the number of vessels will have a significant impact on research capacity as any vessel, regardless of how well equipped it is, can only be in one place at one time. If the polar regions are to share one vessel, this would constrain the amount of research that can be carried out. For more detailed information on this, we recommend that the committee contact NERC directly.

Natural Resources in the Arctic

7. Governance over the resources in the Arctic is shared by the five Arctic states (Russia, USA, Canada, Denmark (Greenland) and Norway). However, the majority of the oil and gas resources are likely to be in offshore Russia, as are most new shipping routes. Current development activity in the Arctic is being carried out by several companies by agreement with Russia, Norway and Greenland. Cairn Energy have a $600 million exploration program in West Greenland, and a number of companies bid successfully in licence rounds in East Greenland in 2012 and 2013. Norway and Russia reached a preliminary agreement to settle the median line dispute in the Barents Sea in April 2010 and Statoil has announced new discoveries in the Norwegian Barents. ExxonMobil has reached an agreement with Russia to explore the Russian Arctic with Rosneft and there are other activities off the coast of Canada and Alaska.

8. The Arctic is known to contain significant resources in the form of oil, gas and minerals. Estimates of the oil and gas resources in the Arctic vary enormously. The United States Geological Survey (USGS), for instance, estimates that up to a 1/5th of the world’s conventional undiscovered hydrocarbon resources lie under the Arctic. Note that this figure refers only to so-called ‘yet-to-find’ (YTF) values, excluding known oil and gas fields, and caution should be applied when using these. They are derived by applying standard methodologies to what is known about regional geology and known resources to estimate as yet undiscovered resources in the Arctic and worldwide, rather than reflecting the results of exploration. Such methodologies can be contested, and the results they produce are necessarily far from certain. While the USGS estimates 114 billion barrels of oil YTF in the Arctic, a UK-based WoodMac/Fugro Robertson study from 2006 estimated that undiscovered resources amount to only 43 billion barrels of oil. To date, most of the hydrocarbon resources
found have been on the North Slope of Alaska, and much of the unexplored area under the ice cap may never become accessible for extraction. One factor in explaining such variation is disagreement in geological interpretation in the absence of exploration data. For instance, there is debate over whether any significant oil and gas prospectivity may have been destroyed by uplift and exhumation of the unexplored areas under the ice cap in the Eocene period (56-33.9 million years ago).

9. It is also important to draw a distinction between resources and reserves. Resource is the amount of oil or gas underground. Reserve is the amount of oil or gas that can be produced economically — that is, which we can realistically expect to extract from the ground given current technological, economic and social/regulatory constraints. In the Arctic, these additional considerations are considerable and so estimates and figures relating to resources may bear little relation to how much of it will be economically and technically extractable.

10. The Arctic region also has significant mineral resources, some of which have been mined for over a century. The main centres of mining north of the arctic circle have been in Russia, which is dominated by Nickel-Copper-Platinum Group Element (PGE) deposits as well as Iron Ore and Apatite. Finland also has significant Nickel-Copper-PGE and Gold deposits and Sweden, in addition to Copper, mines Iron Ore in the Arctic circle at one of the world’s largest underground mines which has been in operation over the last 100 years. Norway has iron ore deposits as well as coal mines in Svalbard. In the North American nations, Canada has Lead-Zinc deposits and there is also Zinc and Gold mining in Alaska. Greenland has no active mining industry at present but there is some interest in the recent discovery of rare earth metals deposits in south-west Greenland which could result in mine development in this area.

**Arctic Sea Ice**

11. Arctic sea ice extent has been monitored by satellite for the past 30 years and, while there are fluctuations year-on-year with regards to maximum and minimum extent of the sea ice, overall it is shrinking. The reduction in the sea ice extent during the Arctic summer period has significant impacts on ecosystems, shipping routes and the livelihood of indigenous populations. In addition to the loss of sea ice coverage, sea ice is also thinning, making it more susceptible to break-up by storms and other extreme weather systems. According to the National Snow and Ice Data Center (NSIDC), 17 September marked the likely minimum extent of the Arctic sea ice for 2014, which was the sixth lowest extent in the satellite record. This reinforces the long-term downward trend in Arctic sea ice extent. Up to date and archive data on Arctic sea ice coverage, including a useful dataset collected by U.S Navy submarines of ice thickness [http://nsidc.org/data/docs/noaa/g01360_upward_looking_sonar/index.html](http://nsidc.org/data/docs/noaa/g01360_upward_looking_sonar/index.html), can be found on the NSIDC website [http://nsidc.org/arcticseaicenews/](http://nsidc.org/arcticseaicenews/).

**Technological Challenges**
12. Development of Arctic resources provides many technological challenges with regards to access, research and extraction activity. Access can be significantly hampered by sea ice coverage, particularly in the winter, as well as the extreme climate conditions in the Arctic. Rapid movement of the sea ice (rotating around the pole) is a serious impediment to any exploration or production activity in ice-covered areas. Furthermore, many vessels struggle to break multi-year ice and the UK currently has no ice-breaking capability.

13. Some comments we received with regard to this call for evidence suggest that the technology required to improve resource characterisation in the Arctic is not yet ready and that it will be important to develop and test required technologies before any planned growth of activity in the Arctic. Technologies currently under development at the laboratory stage to allow ‘down-hole’ processing of hydrocarbons – to produce clean power and industrial feedstocks safely in situ without needing to extract and transport oil – may one day allow these resources to be used with minimal environmental impact. At present, they remain many years from maturity, and are unlikely to play any role in mitigating the effects of a first wave of Arctic development.

Environmental Change

14. An overwhelming body of evidence, published by the Intergovernmental Panel on Climate Change (IPCC) and others, shows that the anthropogenic contribution to current climate change is very significant and that this can be linked to the overall reduction in Arctic sea ice coverage. Importantly, temperatures are rising approximately twice as fast in the Arctic as the global average, and the polar regions play a vital role in climate regulation.

15. The Geological Society published a statement on the geological evidence base for climate change in 2010 (www.geolsoc.org.uk/climatechange), to which we issued an addendum in 2013 setting out recent research findings. This statement focuses on the geological evidence base for past and present climate change, which is independent of other lines of evidence such as atmospheric measurements and climate modelling. The expert working group which reviewed this evidence reached the same broad conclusions with regards to the anthropogenic contribution to climate change as those arising from other evidence bases. Whenever large quantities of carbon have been released rapidly into the atmosphere in Earth’s past, global temperatures have risen, temperatures in the polar regions have risen more rapidly, and sea ice extent has reduced greatly. Oceans have become more acidic and less oxygenated, major extinction events have occurred, and it has taken the Earth system a period of the order of 100,000 years to recover.

Environmental Management

16. Activities such as fossil fuel exploration and extraction in the Arctic need to be balanced with effective protection of what remains a near-pristine environment. Increased activity in the Arctic from exploration and the opening up of shipping routes could result in pollution. Effective monitoring of the impact of development
on the Arctic will require comprehensive baseline surveys of background concentrations and emissions of key pollutants; this will help to provide a robust approach to environmental management.

17. At present there is no consistent regulatory framework amongst the five Arctic states. This needs to be developed ahead of any surge in activity in the Arctic. Both the UK and geoscientists more generally have an important contribution to make in terms of safe management of this unique environment. Geoscience research and expertise in areas such as paleoclimatology and environmental monitoring can enhance understanding of Arctic environments and contribute to the evidence base to inform future regulatory frameworks. The UK has an opportunity to contribute to this through its observer status at the Arctic Council.

The Effect on the UK and the UK’s Role in Governance

18. As the UK is not an Arctic State, its governance role is limited, and direct impacts on the UK as a result of Arctic activity are not likely to be great. However, involvement of UK companies in oil and gas development in the Arctic may be beneficial for energy security in the medium term, particularly as we seek to bridge the gap between our current reliance on fossil fuels and more sustainable long-term means of energy generation in line with our decarbonisation commitments. UK involvement in the development of resources may also have also positive impacts on the economy. These potential benefits should be weighed against known and potential environmental impacts.

19. The development of the Arctic is an opportunity for the UK to demonstrate international leadership in a number of areas. The UK has an excellent science base in research supporting oil, gas and mineral exploration and extraction, as well as a thriving and respected industry which has much to offer in terms of expertise and leadership to any burgeoning industry in the Arctic. It also presents an opportunity to use and share our experience and expertise in robust regulation to support effective environmental management, and to provide leadership on issues of environmental monitoring and protection.

Reference:


September 2014
Dr Dougal Goodman – Written evidence (ARC0022)

Background
1. I am submitting this evidence to the Committee in a personal capacity.
2. I am the Chief Executive of The Foundation for Science and Technology. Before I joined the Foundation I served as a Deputy Director of the British Antarctic Survey and before that I was employed by BP in a variety of roles including leadership of a research programme to estimate the design load for structures to be built offshore the North Slope of Alaska, as a manager of North Sea production operations and as the Head of Safety for the company.
3. I have travelled extensively and undertaken research in Alaska, Canada, Greenland and Svalbard. My PhD and Post-doctoral research was on the mechanical properties of glacier and sea ice.

Change in the Arctic
4. Change in the Arctic Region is not a recent development. Since the Second World War new transport infrastructure has increased access for goods and services and export of products. The recent widespread use of mobile phones and broadband access, has improved education and social and cultural exchange. There has also been a shift to give power and land ownership to indigenous peoples.
5. The construction of the Distant Early Warning Line (DEW Line) in the 1950s and 1960s led to the construction of many airfields which provided new access to the Region and had a significant impact on the communities of Northern Alaska, Canada and Greenland. The exploration for oil and gas in Alaska and the development of the Prudhoe Bay and Kuparuk oil fields and the construction of the Trans-Alaska Pipeline System (TAPS) in the 1970s and 1980s had a profound impact on the North Slope of Alaska and on the economy of Alaska as well as supplying a significant proportion of domestic oil production in the United States. Similarly oil exploration in the Canadian Beaufort Sea in the 1980s had impacts on the Northern communities as well as spurring the development of new technology for offshore oil exploration. More recently development of oil and gas projects offshore Sakhalin in the sub-Arctic has pushed the technology forward for offshore developments in ice infested waters, strong currents and severe weather.
6. The rising average temperatures and long-term reduction of the summer sea ice extent observed in the Arctic will have a significant impact on communities through wave erosion of beaches, melting of permafrost and increased shipping but there will continue to be frozen seas, extremes of low temperature in the winter, prolonged darkness, and limited access during long periods of the year. The challenges for most communities, however, are not from climate change but from the social stresses suffered by isolated communities with few employment opportunities supported by welfare.
7. The search for economically viable mining opportunities to meet global demand has led to the development of major ore bodies and metal deposits in the Arctic Region. Economies of scale and high grade ore offset the high costs of taking the ore to markets. Greenland, until the mine at Ivigtut was worked out, was a significant exporter of cryolite which is used in the extraction of aluminium from bauxite.
8. While some features of the countries of the Arctic Region are similar – harsh climate, difficult to access, sparsely populated, ice covered seas for parts of the year – they differ in important respects politically and economically. There is no one size fits all solution to the management of change in the Region.
9. The communities I have visited in the Arctic Region want better transport links, improved education for their children, health services, employment and access to the goods and services that people in most developed countries would expect to be available. Development with respect to strong cultural traditions and history is a common message.
The World Economic Forum Report – *Demystifying the Arctic*\(^{31}\) succinctly sets out the issues for the Region.

**Future Prospects**

**Oil and Gas**

10. In the medium term all economically attractive development opportunities are in state jurisdictions onshore or within Exclusive Economic Zones offshore. Arctic Council discussions may influence the choices to be made but ultimately the Arctic States, regional and local authorities will decide which developments go ahead. For example transits through the Northern Sea Route will be permitted by the appropriate Russian agency\(^{32}\) not by an international body.

11. The US Geological Survey (USGS) in a report published in 2008\(^{33}\) reviewed the hydrocarbon provinces in the Arctic Region. The assessment concluded that approximately 90 billion barrels, 1,669 trillion cubic feet of gas and 44 billion barrels of natural gas liquids may remain to be found in the Arctic. 52% of these resources are in Russia, 20% in US, 12% in Norway, 11% in Greenland and 5% in Canada\(^{34}\). While Arctic oil and gas development is technologically, environmentally and politically challenging, projects can be economically very attractive through economies of scale and favourable tax regimes compared to developments elsewhere. The Prudhoe Bay oil field and the Trans-Alaska Pipeline System were profitable developments for BP.

12. Royal Dutch Shell, ExxonMobil, Statoil, Chevron, Gazprom, Rosneft and other companies would not be investing in Arctic exploration programmes if they did not believe economic production opportunities would be discovered. However, the time to first oil or gas for new prospects could be ten to twenty years away.

13. Arctic States want oil and gas developments for security of supply and revenue generation reasons particularly as oil supply from the Middle East may become less reliable. The State of Alaska, Russia and Norway will become more dependent on revenue generated from oil and gas produced from the Arctic Region.

14. However, the development of shale gas and unconventional oil is changing the global supply balance putting some projects in the Arctic on hold such as the Shtokman Gas field development in the Barents Sea. The potential LNG export market from the Barents Sea to North America has disappeared. Nevertheless, Gazprom has tested use of the Northern Sea Route (North of Russia) for export to the East by shipping in November, 2012 a cargo of LNG from Hammerfest in Norway to Tobata, Japan\(^{35}\).

**Shipping**

15. The decline in sea extent since the 1970s has allowed sea traffic to move more easily along the Northern Sea Route in the summer season. The Northern Sea Route has always been important for the resupply of Russian settlements on the Northern coast and the export of resources such as nickel ore. Norilsk Nickel for example operate a fleet of ice strengthened ships year-round to export nickel ore from Dudinka on the Yenisei river to Murmansk.

16. The Russian Northern Sea Route Information Office\(^{36}\) has a list of all the transits and a plot of the transits by month and the corresponding ice extent for each month. There were 71 transits in 2013. Although the Northern Sea Route offers advantages of shorter voyage

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\(^{32}\) [www.arctic-lio.com/nsr_howtogetpermit](http://www.arctic-lio.com/nsr_howtogetpermit)

\(^{33}\) USGS – Circum-Arctic Resource Appraisal: Estimate of Undiscovered Oil and Gas North of the Arctic Circle, 2008

\(^{34}\) EY Report on Arctic oil and gas


\(^{36}\) [www.arctic-lio.com/nsr_transits](http://www.arctic-lio.com/nsr_transits)
distances from Europe to SE Asia or vice versa not many ship operators are taking advantage of the option probably because the ice conditions can be very variable from year to year, the high cost of fees to transit the route, the few places of refuge if a mechanical problem develops and water depth limits along parts of the route.

17. Multi-year sea ice in the Arctic Ocean has declined and tends to be carried away from the Northern Sea Route by the prevailing winds although there is always a possibility that it can be present on the route. Nataliya Marchenko\textsuperscript{37} catalogues ship incidents on the Northern Sea Route including an event when many ships were caught out by a large area of multi-year ice in the Chukchi Sea moving towards the coast trapping them in the ice.

\textbf{Metals and Minerals}

18. The Arctic region is a rich source of metals, minerals and coal. For example coal has been mined in Spitsbergen for many years, an iron ore mine began operating in September, 2014 at Mary River, Baffin Island and the London Mining Company is seeking finance for an iron ore mine at Isua, Greenland.

\textbf{Fishing}

19. Fish and crustaceans form an important food supply for many settlements in the Arctic region and are also an important export product. Greenland’s economy is underpinned by the export of shrimps, cod, halibut and salmon. Limiting catches to create sustainable fisheries is a major challenge.

\textbf{Tourism}

20. Adventure tourism has grown rapidly and represents an important income stream for settlements that can easily be accessed by sea in the summer by tour ships. Longyearbyen in Spitsbergen and Nuuk in Greenland are popular destinations. A small number of tour ships have transited the Northern Sea Route and the North West Passage and even fewer have been to the North Pole.

\textbf{UK interests in the Arctic}

21. The UK has extensive interests in the above sectors through oil and gas companies with interests in Arctic projects or through trading oil and gas exported from the region, metals and mining companies, equipment and service supply companies, engineering consultancies, fish processing companies, tour operators, naval architecture practices and defence contractors.

22. London is a global centre for legal firms (many contracts are under English law), finance (particularly project finance), insurance and reinsurance (Lloyd’s of London) and ship broking (The Baltic Exchange) who are all involved in Arctic projects.

23. A significant proportion of the Protection and Indemnity (P&I)\textsuperscript{38} reinsurance cover for global shipping and insurance cover for well control are placed in the London market. A major insurance loss in the Arctic region would be partly paid out from companies underwriting in the London market.

\textbf{Risk Management}

24. The Arctic littoral states, flag states of ships, certifying authorities and companies doing business in the Arctic Region have to decide what is an acceptable risk to take a project forward. All operators know that the Arctic is a particularly sensitive environment and that

\textsuperscript{37}Marchenko, Nataliya, \textit{Russian Arctic seas : navigational conditions and accidents}, Springer, 2012

\textsuperscript{38}International Group of the P&I Clubs, \url{www.iggandi.org}
the ‘licence to operate’ could be easily lost. One mistake and the licence is lost for the operator and other companies in the sector.

25. For example a cruise ship operator intending to visit Ilulissat (formerly Jacobshavn) in Greenland knows that tourists would like to go there to see the icebergs calving into the bay but has to decide whether the design of the ship can cope with sea ice in the bay, a collision with an iceberg (particularly a growler – a bergy bit washed over by the sea that is difficult to detect on radar in fog) and whether the charts are sufficiently accurate to avoid grounding. The operator also has to judge whether the remote location, limited search and rescue support and lack of ocean going tug capacity, port of refuge and supply facilities are too great a risk for vessel operation. The Flag State for the vessel, the insurers, the Greenland authorities and the Certifying Authority for the vessel will all be interested in verifying the operator has undertaken a thorough risk assessment and that the vessel is properly equipped and maintained for the voyage. Once a permit has been agreed with the authorities and the insurers and certifying authorities are satisfied that the vessel is capable of making the voyage it is up to the operator to decide whether the risk is acceptable.

26. Certifying Authorities\(^\text{39}\) are organisations such as ABS, BS, DNV GL, Lloyd’s Register, RS or NK who provide a classification service to independently review designs and an inspection service to operators intending to supply ships or other offshore facilities in the Arctic region.

27. The International Maritime Organisation has been negotiating for a great many years a mandatory International Code of safety for ships operating in polar waters (the Polar Code), to cover the full range of design, construction, equipment, operational, training, search and rescue and environmental protection matters relevant to ships operating in the inhospitable waters surrounding the two poles. This will be introduced as a new chapter of the Safety of Life at Sea (SOLAS) Convention. A prudent operator is likely to have already exceeded the requirements set out in the Polar Code.

28. There are interesting parallels with the response of the US to the 2004 loss of the M/V SELENDANG AYU. The vessel lost power and went aground in the Aleutian Islands spilling a large quantity of bunker fuel and soya beans. Sadly six crew of a rescue helicopter were also lost. The Aleutian Islands have many similar characteristics to the Arctic Region – bad weather, remoteness, lack of facilities, sensitive environment, etc. The authorities asked the Transportation Research Board of the National Academies (equivalent to The Royal Society and Royal Academy of Engineering in the UK) to undertake an independent review of the risk assessment process for the risk to people and the environment from shipping operating near the Aleutian Islands. The report was published in 2008 – *Risk of Vessel Accidents and Spills in the Aleutian Islands, Designing a Comprehensive Risk Assessment*, US Transportation Research Board of the National Academies (Special Report 293)\(^\text{40}\). The report recommended a two stage analysis of the risks. An initial scan of all the potential risks and then detailed analysis of the top few risks (which is still in progress\(^\text{41}\)). The review was funded by the fines paid by the operator of the vessel. The time taken from the accident to the final risk management plan of over ten years is substantial but the lessons learned could be valuable for regulators and ship operators in the Arctic Region.

29. Oil and gas companies and mining companies recognise the special risks of exploration and production in the Arctic Region. They will reduce the risk to as low as reasonably practicable by eliminating a risk (e.g. no longer using heavy fuel oil) or mitigating the risk (putting in place contingency plans for a well cap system and oil spill response). Their plans will also be under intense scrutiny by national, regional and local regulators and NGOs. Most regulators

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\(^{40}\) [http://onlinepubs.trb.org/\text{Onlinepubs}/sr/sr293.pdf](http://onlinepubs.trb.org/\text{Onlinepubs}/sr/sr293.pdf)

\(^{41}\) [http://dec.alaska.gov/spar/\text{perp}/ai\_risk/ai\_risk.htm](http://dec.alaska.gov/spar/\text{perp}/ai\_risk/ai\_risk.htm)
Dr Dougal Goodman – Written evidence (ARC0022)

will require publication of safety cases, risk assessments and environmental impact assessments.

30. To support the writing of these documents the oil and gas industry is funding joint-industry research programmes to address critical issues such as how to respond to an oil spill under ice – e.g. the Arctic Oil Spill Response Technology Joint Industry Programme (JIP)42. Governments and other bodies are also funding research into this topic - for example the US Corp of Engineers report Oil Spills in Arctic Waters Report43 summarises many projects researching how to respond to oil spills in the Arctic.

31. Best practice in risk management is to put in place effective management processes starting with leadership from the top. The outcome of the process will be the best that can be achieved in the circumstances. DNV GL market a process audit scheme to help companies review and test the management processes they have in place44. Safe companies have well developed ethical and safety policies and a strong culture of risk awareness. They also have well developed scenarios for low probability, high severity events, which can be used to test the capability for management to respond and whether they have the right hardware and systems in place.

32. The systems for the certification and training of individuals such as drilling engineers or merchant marine officers who are to work in the Arctic Region could be improved.

Research

33. The UK has a significant resource in universities and research institutions that can be applied to understanding the risk exposures from Arctic development projects and how to respond to them. The Natural Environment Research Council and its component institutions, the British Antarctic Survey and the National Oceanography Institute should take the lead to co-ordinate research. The Engineering and Physical Sciences Research Council also has an important role to play. Many of the risk reduction actions require engineering solutions or statistical analysis. For example, the estimation of the design load for offshore production structures in ice infested waters or the statistical analysis of ice extent data.

Conclusions

34. The Arctic States want development to go ahead provided the environmental risks can be effectively managed. Many UK based companies particularly in the oil and gas, mining, finance, legal, engineering consultancy and insurance sectors will be involved and could provide leadership in risk management.

35. The Foreign Office Adapting to Change: UK Policy towards the Arctic45 document has the right balance between recognising that development decisions are in the hands of the people of the Arctic States but advocating responsible development with policies based on sound science with full regard to the environment.

36. The pace of change in the Arctic Region is probably slower than elsewhere in the world. The consequences of high rates of economic growth in China and India, resource development in Africa (particularly of LNG projects), shale gas and unconventional oil development, and the failure of states in North Africa and the Middle East are likely to have a far greater impact on the UK than Arctic developments.

37. The ‘licence to operate’ is difficult to obtain in the Arctic Region and can be lost for ever through one mistake.

42 www.arcticresponsetechnology.org
44 www.dnv.com/industry/oil_gas/services_and_solutions/risk_management_advisory/safety_risk_management/isrs/
Dr Dougal Goodman – Written evidence (ARC0022)

September 2014
TUESDAY 14 OCTOBER 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Moynihan
Baroness Neville-Jones
Lord Oxburgh
Lord Soley
Lord Tugendhat

Examination of Witnesses

Ben Ayliffe, Head of Campaigns for the Greenpeace Arctic Programme, Greenpeace UK,
Charlie Kronick, Senior Climate Policy Adviser, Greenpeace UK, and Nathalie Rey, Deputy
Head of the Political and Business Unit of Greenpeace International, Greenpeace UK

Q173 The Chairman: I open this public evidence session of the Arctic Select Committee and
welcome members of staff of Greenpeace here for this particular session. Perhaps I could go
through one or two things. I hope you have a list of the interests of individual Members so
you can see those. This session is being broadcast live. We are also taking a transcription,
which you will see and will have an opportunity to correct if you feel it is wrong.

I am grateful that you do not want to make any opening remarks, because we have a
substantial piece of written evidence from you, and I thank you for that. It would be nice if
you could introduce yourselves individually. I remind you before we go into questions that I
do not expect all of you to answer all the questions. I will leave it to you as to who responds to which. Please introduce yourselves if you would like to.

**Nathalie Rey:** My name is Nathalie Rey. I am the deputy head of the Political and Business Unit of Greenpeace International. Until recently I was a senior oceans policy adviser, concentrating on international marine governance in areas beyond national jurisdiction and marine conservation.

**Charlie Kronick:** My name is Charlie Kronick. I am the senior climate policy adviser at Greenpeace UK and for most of the last seven years I have been working specifically on oil at the extreme ends of extraction and the relationship to capital markets.

**Ben Ayliffe:** My name is Ben Ayliffe and I am the head of the international campaign at Greenpeace against arctic oil drilling and, like Charlie, I have been working on oil, tar sands and things like and the Arctic for about the last five or six years.

**Q174 The Chairman:** Thank you very much. I will move on our questions. First, how fast do you see the pace of environmental change in the Arctic? Is there any reason to believe that there will not be, because of it, further increases in economic and industrial activity in the Arctic over the coming decades, regardless of those environmental shifts and, perhaps, despite all the barriers that there are in the Arctic to commercial exploitation?

**Ben Ayliffe:** Greenpeace’s view is that the change that we are seeing in the Arctic is both rapid and fundamental. The data from the scientists about the extent and volume of sea ice tell us that the Arctic is in a pretty bad way. The overall trend is worrying. The sea ice is declining at an increasing rate in all months of the year, with a noticeable decline in the summer months. Since about 1979, the start of the satellite records, the loss in the summer has been around 11% per decade, and the last eight years have seen the lowest eight minimum summer extents in the satellite record. The record low of 2012 was around 44%
below the 1981 to 2010 average. The picture is pretty stark and I think that compels action, which is at the heart of the Greenpeace campaign.

I was up in Svalbard a couple of weeks ago with President Anote Tong of Kiribati, who we took up there to witness the change in the Arctic. I had an interesting discussion with one of the Norwegian ice pilots who was on board our ship, the “Esperanza”. He had lived up in that region for many years and he told me that he had seen noticeable glacier retreats in the archipelago, and that one of the fjords that we were crossing, Billefjorden, had been ice free for the past two winters, which was unheard of. He told me how creatures like the bearded seal, which rely on sea ice to haul out, were decreasing in numbers in Svalbard because the ice is disappearing and they are being replaced by seal species that need land to haul out. This is admittedly anecdotal evidence, but it really brought home to me personally that there is obvious evidence that the region is changing and that we need to act accordingly.

Charlie Kronick: I would add very briefly that the relationship of temperature change and decrease in sea ice has certainly encouraged the fossil fuel industry to feel that there are more opportunities for extraction. In Shell’s experience in Alaska in the summer of 2012, a reduction in winter sea ice does not necessarily mean there will be a reduction in ice during the brief exploratory periods. The weather conditions are still extreme. The sea conditions as a result of reduced ice are actually occasionally more extreme and, as has been highlighted by both the US Geological Survey and the industry itself, the clean up of a significant or even a minor oil spill in ice-covered waters or waters that are at least part of the year covered in ice is next to impossible with existing technologies.

The Chairman: I think we will come on to that later on.
Charlie Kronick: I will not go into the details, but it was the issue of whether that leads to the inevitability of further extraction. The commercial narrative says yes. I would say that the environmental, financial and management narratives would say no.

The Chairman: But is it not just inevitable, because of the way human societies or economies work, that when opportunities arise because of changes, whether we like them or do not like them, something is going to happen? Therefore, rather than try to stop it, should we not try to make it acceptable, controlled or regulated in the right way? I suppose that is what we are trying to get at.

Charlie Kronick: That is a fair question, but you have to look at that challenge of human inevitability in a certain set of circumstances with the broader context and so take your lens back to a little higher degree of altitude. The oil-demand scenarios put out by the IEA but equally by the companies themselves, whether it is BP’s annual energy statistics or Shell’s scenarios, look at a range of consumption scenarios and then relate them to climate change and average temperature increases. Within the event horizons that are projected by any responsible voice in the industry, any significant extraction of oil from the Arctic would be beyond 2030 or 2035 and would mean that we were at a level of oil consumption or fossil fuel consumption generally that was committing to a global average temperature increase of 4 to 5 degrees. If we, as a society or as a set of industrialised nations, are choosing to respond to climate change in any meaningful way, frankly that rules out that kind of exploration and exploitation in the Arctic. Does that mean there will be absolutely no activity there? Let us be clear, Greenpeace is not calling for a withdrawal from the Arctic and absolutely no activity there; we are focused on oil and gas extraction but also on the management of issues like fisheries and shipping.

The Chairman: Lord Hannay, I think you had a supplementary specifically on oil price.
**Lord Hannay of Chiswick:** Can you comment on the extent to which the current direction of the oil price is likely to affect the problems that you see in development of oil and gas reserves in the Arctic? Could it in fact shoot your fox?

**Charlie Kronick:** I hope not, not the Arctic ones anyway. The oil price has two effects: there is a push and there is a pull. The oil reserves that are being projected to be exploited in the Arctic are definitely at the high end of the cost curves, there is no doubt about that. If you look at the Citibank cost curve, which is reproduced by the IEA, the Arctic is at the far end of the expensive scale. So a flat oil price, or even a high but not particularly volatile oil price, does not lead one to conclude that there is going to be a high likelihood of extraction any time soon. There never was a high likelihood of extraction any time soon. We would certainly argue, and we have heard from many people in the capital markets, that the exploration, certainly in Alaska but to a certain extent in Russia and Norway as well, is about reserve replacement. I am sure you well know that oil companies are valued largely in the capital markets by their reserve replacement ratios. The question I would ask is: are these genuine plays for production or are they about reserve replacement?

The only thing I would add is that I think it is really important to separate oil and gas. On Arctic gas, that fox is definitely shot. It is just too expensive, given the glut of gas in the global markets. It has been volatile and the change that shale in North America has meant to global gas markets has been very rapid, so things could change again. For the foreseeable future, transporting gas in the high Arctic is too expensive, too much infrastructure is required, to be seriously considered.

**Lord Hannay of Chiswick:** Presumably your point about reserve replacement, which is very valid, is that reserve replacement has none of the risks that you see to the Arctic. It is only development that has that risk.
Charlie Kronick: I would just remind you that Deepwater Horizon was an exploration rig, not a production rig. There are just as many risks from exploration drilling as there are from production, perhaps more because there is less infrastructure in place.

Q175 Lord Moynihan: We have had evidence from the IAOGP that, “If ice is present, ice formations can help contain spills and reduce wave activity compared to open water”, and they go on to argue that there are other ways in which oil spills within an ice environment can be managed. Is it the presence of ice that leads you to conclude that there should be no activity in an oil and gas province where ice exists as opposed to any other province around the world? If so, what is your reasoning? Do you call, for example, for a withdrawal of any exploration and production activity in Alaska as a result of the presence of ice? Could you elaborate a little more, in other words, on how significant the oil spills could be in the context of ice-covered environments?

Ben Ayliffe: For the sake of clarity, the Greenpeace policy, if you can call it that, is that we consider offshore Arctic oil to be the region within 100 kilometres of the 30-year, 15% sea-ice maximum as defined by the Norwegian Polar Institute. Ice is the biggest driver in the concerns about drilling in the Arctic. There is the clear carbon logic argument as well—we should not be drilling for more of the oil that is causing the melting to happen in the first place—but ice poses significant, unprecedented challenges to the oil industry. To quote Shell themselves in Alaska, “There is no sugar coating this. If you ask me will there ever be spills, I imagine there will be spills”.

When you consider that there is no known way of cleaning oil that is spilled in ice, we do not think that you should be operating there. The challenge is mechanical recovery: booms and skimmers simply do not work in ice-infested waters; in-situ burning is disrupted by wind and things like that; and we do not know the long-term eco-toxicological impacts of putting
Greenpeace – Oral evidence (QQ 173 – 188)

chemical dispersants in the Arctic. The colder waters reduce the efficacy of the chemicals themselves.

All in all, a spill in the Arctic would be the nightmare scenario. You have issues of darkness and remoteness. In Alaska, for instance, they are 1,000 kilometres away from the nearest US coastguard station. Dealing with the sort of accident that we saw in the Gulf of Mexico, where BP had 50,000 employees and thousands of ships—the centre of the global oil response industry—that simply would not happen in Alaska.

Charlie Kronick: Or in Russia.

Ben Ayliffe: Or in Russia, yes, or Greenland. The risk is compounded by the threat of winter. If you had a blowout late in the season, it would be exceptionally difficult for the drilling of a relief well. We noticed a report out the other week where Shell was lobbying the US Government against their rules in Alaska that stipulate the use of a second drilling well in case of an emergency. The fact that a company like Shell, which made such a hash of drilling in Alaska in 2012, is now looking to water down the regulations in the USA is deeply worrying.

Lord Moynihan: Specifically, is it your position that you would call for a moratorium in any areas of the world where there was ice-impacted exploration or production activity, irrespective of whether it is technically within the Arctic or whether it is in—

Ben Ayliffe: The Arctic offshore, yes.

Lord Moynihan: Only within the Arctic offshore?

Ben Ayliffe: Yes.

Lord Moynihan: If there was development in the Antarctic, would you take exactly the same position and the same logic that you have expressed today?

Ben Ayliffe: That would follow, yes.
Q176 Viscount Hanworth: The idea of a moratorium on Arctic drilling is very attractive to those who have an environmental consciousness, but how would it be negotiated, established and enforced? Moreover, what would the response be to the proposal of a moratorium by the nations that have an interest, the Arctic nations that could plausibly pursue drilling?

Nathalie Rey: The process of agreeing a moratorium is that the Arctic nations themselves can come together and agree that they will not allow any further oil drilling in their EEZs. In theory, as they are coastal states of the Central Arctic Ocean, they would be able to agree a legally binding agreement that included not authorising any extractive activities in the Central Arctic Ocean until the necessary rules and regulations are in place. A moratorium is a temporary ban until the necessary rules and regulations are in place. Under UNCLOS it is possible for countries to come together and make such an agreement. The Central Arctic Ocean is an area beyond national jurisdiction, which falls under the International Seabed Authority. This is the body that manages deep sea mining in that region, so that would be involved. Sorry, what was your second question?

Q177 Viscount Hanworth: How would the various Arctic nations that have an interest in oil extraction and gas extraction react to a moratorium? What sort of resistance might there be? In particular, as far as I know, there is one productive oil well in the region, and that is Prirazlomnaya. Can you explain to me how productive that is and how resistant the Russians would be to the moratorium if it were proposed and if other nations were to adopt it or advocate it?

Charlie Kronick: I can talk about it in general and Ben will come back to the issue specifically of Prirazlomnaya. I would refer back slightly to the earlier conversation: the intention and the likelihood of these plays becoming productive in the near term, which I think will
determine and to a large extent influence the political viability of a moratorium, particularly on the idea of further expansion of the industry. Just to be clear, we are not advocating the shutdown of the North Slope rigs in Alaska or Sakhalin Island. We are not talking about shutting down the existing industry; we are talking about stopping the further expansion of it. To a large extent, I think future economics will determine how possible it is to negotiate this kind of moratorium.

Specifically around the Russian Arctic, it is very clear—not focusing on one producing well but the wells that Rosneft is planning further up into the Kara Sea with its various joint ventures—that the plays are entirely dependent on their foreign partners, whether that is Exxon; BP, which owns 20% of Rosneft, as I am sure you know; or Shell potentially with Gazprom. There is already quite a lot of tension between the active participants in the region, in the province, as to whether or not further expansion there is going to be good for one or the other. There is quite a lot of downward economic pressure on expansion in Russia. There is quite a lot of potentially downward regulatory pressure on expansion in the US and Canada.

Four or five years ago many people described it as inevitable that these resources would be exploited and I think that is no longer the case. Total’s decision not to drill in the high Arctic, the fact that Statoil has withdrawn from the North American Arctic, the fact that ConocoPhillips is paying for rigs that it is not using in the North American Arctic, tells us that there is not quite as much pressure for extraction and expansion as we were led to believe or as the narrative would have told you even two or three years ago.

**Viscount Hanworth:** How does Greenpeace imagine that in the long run the world can satisfy its energy needs if not by hydrocarbons? I hope this is not going off message.

**The Chairman:** It is quite a broad question but if we could just narrow it down.
Charlie Kronick: The first way in which we and pretty much everybody else who talks about energy consumption is that it is not about expanding sources of energy; it is about managing demand. To bring it back specifically to the context of the Arctic, oil demand in the OECD has already peaked. They will never sell more oil in North America or Europe than was sold in 2008, and not just for economic reasons; it is also for structural reasons. The growth in demand in China has slowed dramatically, and India is certainly an outlier, but the reality is that oil demand is slowing and peaking. Then the question becomes, first of all, how you manage the demand down further. The biggest change has been the big crash in price in renewables, particularly for solar, and one of the ways of grid balancing and managing generation of renewables in the future will be through storage in domestic storage and in electric cars. As well as an imperative for environmental reasons to reduce fossil fuel consumption, there is now a legitimate and pretty well recognised commercial pathway for taking oil consumption much lower than it currently is.

Viscount Hanworth: That fails to answer the question, because we are talking about the plausibility of a moratorium, and I think you have to be pretty persuasive about a future scenario whereby there is a diminishing demand for hydrocarbons.

Charlie Kronick: We would be happy to come back to that discussion.

The Chairman: Just following up Viscount Hanworth, do you see the Arctic Council as the medium for getting such a moratorium? In terms of really practical politics, if this was to happen—and I am looking for a fairly short answer—what route would you use that might be achievable? I think that is what we are trying to understand.

Nathalie Rey: The Arctic Council could be a possible forum, because all the key players that are involved in these discussions are already at the table. Until now it has shown itself not
really as a policymaking body but more as a policy-forming body. It would probably have to reform quite significantly to be the forum, but it is a possibility.

The Chairman: We will come on to the next question then. If that does not work, what would?

Nathalie Rey: It is possible for coastal states to come together outside a legal body and agree that they will co-ordinate together to create a moratorium on oil drilling. It has already been happening with fisheries. The US Government have been leading discussions on having a moratorium on high seas fishing, so it is perfectly possible for countries to come together and have these discussions outside a legal entity such as—well, the Arctic Council is not a legal entity as such—outside a body.

Ben Ayliffe: I would just add that the US has recently been talking about the possibility of pan-Arctic drilling standards. This is not the same, obviously, as a moratorium on Arctic drilling, but it gives some indication that there are mechanisms and that if the will is there there are ways and means of enforcing stricter regulation on drilling.

The Chairman: Thank you very much.

Lord Oxburgh: If I may follow that up, the Norwegians distinguish the high Arctic from the less high Arctic, and of course they have a progressive process of going further north each time and testing the water. Do you have any comments on that, because I think it is relevant to this?

Ben Ayliffe: On their success or their policy in general?

Lord Oxburgh: Both.

Ben Ayliffe: The Norwegians with Statoil talk a good game about environmental protection and having gold standards, but they would be in no better position to deal with a spill close to the ice edge in places up in the Hoop field where they were this summer. They have
drilled six wells in the northern Barents this summer and found no oil. Again, it indicates to us that the NORSOK drilling standards that the Norwegian authorities present as the gold standard are not ice-specific. We think that a lot would need to happen for them to come anywhere near being robust enough to meet the challenges. It also goes back to the idea that the Arctic is not perhaps the land of milk and honey for the oil industry that we have been led to believe, because yet again, much like Cairn Energy in Greenland, they have found dry wells.

Q178 Lord Oxburgh: How do you think the Arctic Council has been doing so far in trying to balance economic considerations against environmental considerations?

Nathalie Rey: I would argue that the Arctic Council has not been doing well on either side, environmentally and on sustainable development. On the environment side, the clearest evidence is the lack of marine protection in the region. There are very few marine protected areas in the region. It has one of the lowest representations globally. There is no clear strategy on how to implement such a global network of marine protected areas, even though this is part of international commitments made by many of the countries within the Arctic Council. Under the Convention on Biological Diversity, there has been an international commitment for 10% marine protected areas by 2020. It is clear that they are definitely not going to achieve that in the Arctic. The Arctic Council began as a body for environmental protection and we are seeing, especially recently under the Canadian chairmanship, a swing towards economic development with the establishment of the Arctic Economic Council, which seems to be more a forum to give business and oil companies a direct link to the senior officials.

In the way the Arctic Council has been operating it has been almost zealously guarding its national jurisdiction by not wanting to allow in new observers, which has changed recently.
It makes it very difficult for organisations or new countries to be observers. It recently revised its rules and procedures, which are very stringent and reflects the over-defensive way it guards its interests and is being very cautious when putting things on the multilateral table.

The Arctic Council has been very successful in coming up with very good scientific reports—excellent reports on Arctic biodiversity and ocean acidification—but it has not been successful in ensuring that there has been action to ensure protection.

**Lord Oxburgh:** How do you think observer states can actually influence this?

**Lord Hunt of Chesterton:** Are you an observer?

**Nathalie Rey:** We have tried—we have an application that has not been accepted yet—for many years already.

**Lord Hunt of Chesterton:** You share that privilege with the European Union.

**Nathalie Rey:** We are still waiting to hear on that. On the roles of observers, I think they can have a very strong influence in supporting an environmental agenda and to seeing the benefits of opening up the Arctic Council to show that they also have an interest in what happens in the Arctic, especially environmentally. That only serves to legitimise the Arctic Council by having a wider membership rather than overzealously guarding the territory by not letting in interested parties that clearly do have an interest.

**Lord Oxburgh:** Do you monitor the UK’s role as an observer?

**The Chairman:** We will come on to the UK’s role in the last question I think.

**Lord Oxburgh:** If we can just get an answer on the Arctic Council.

**The Chairman:** By all means, yes.

**Nathalie Rey:** I think the UK could have a role in supporting—
Greenpeace – Oral evidence (QQ 173 – 188)

**Lord Oxburgh:** It is not a matter of “could have”. Have you been watching what the UK has been doing?

**Charlie Kronick:** Not in great detail. We reviewed the policy that was published last autumn that revealed some interesting tendencies.

**Lord Oxburgh:** That is fine. Thank you.

**Q179 Lord Soley:** The Chairman asked about the practical politics of what you are suggesting, and in your answer you said that the Arctic Council was governed perhaps too much by national interests. Is it not the hard practical reality that Russia will not allow it to become anything else and that at the end of the day they are the major power with the major coastline in the Arctic? You know to your cost the problems that you have dealing with Russia and trying to get them to accept that the Arctic Council might transfer into an international body of the type you would like to influence as an NGO.

**Ben Ayliffe:** I would say that it is not necessarily just Russia. I think Canada and Norway in the past have had similarly quite regressive views on the role of the Arctic Council.

**Lord Soley:** Does not that make it worse?

**Ben Ayliffe:** I was going to come on to say that I think this goes to the heart of the future legitimacy of the Arctic Council, because what happens in the Arctic affects much more than those Arctic littoral states. The changes that we are seeing in the Arctic can be tackled only in part by global efforts on climate deals and things like that. So if the Arctic Council wishes to maintain its credibility and its central role in the future governance of the Arctic, it has to open up. You could not imagine countries like China or India, which have already expressed strong interests in the north, agreeing to the status quo where they are in effect kept on the side-lines of what is an increasingly important and geostrategic forum.
Lord Soley: The implications of what you are both saying are that the Arctic Council either cannot survive or, if it does, it will have to be overtaken by some much bigger international organisation. That is what you are saying, is it not?

Ben Ayliffe: I think it has to have more of a global mind-set. One of the concerns that we have had in the past is that it does very good science but it has always felt like a boys’ club for the top of the world. As I said, the challenges that the Arctic faces cannot be solved by Arctic littoral states and other members of the council alone. It will ultimately have to change in some form or other or lose its relevance.

The Chairman: If I could come back on the governance or the moratorium side, there is the example of the Ilulissat Declaration of 2008. Is that model relevant in any way?

Nathalie Rey: The declaration basically wants to maintain the status quo. It says that it does not need to have a new, legally binding agreement to cover the Arctic. The Arctic Five feel that existing international instruments are enough. We would argue that because of the importance of the Arctic a legally binding agreement is needed that is relevant and much more specific to the Arctic.

The Chairman: I suppose what I was trying to get at was that that was an example of the five leaving the other three behind and getting on and trying to do something, but you are saying that it should be much broader internationally rather than smaller.

Nathalie Rey: It should be broader. In a way it was sort of saying, “Hands off, we are fine as it is”, and we would argue that there needs to be greater—

Lord Hannay of Chiswick: On this question of exclusivity that you have taken issue with and said that the Arctic Council is too exclusive, you do not appear to have the same criticism of the Antarctic treaty, which is just as exclusive but happens to do the things that you want it to do?
Ben Ayliffe: I have not worked on the Antarctic treaty. Our focus is very much on the Arctic, and the power plays that we see in the Arctic at the moment are such that we cannot not be involved.

Charlie Kronick: We are not a Government; we are the first to admit it. Our legitimacy comes partially from our supporters and partially from our participation over a long period in this set of questions and issues. Our focus on the Arctic and governance in the Arctic is a pretty instrumental one and we are not trying to cover that up. We feel very strongly, as I tried to say but not adequately, that there needs to be a very strong move away from the status quo in energy consumption and the industrial model of energy production that we are currently pursuing and that would be accelerated by expansion into the Arctic.

One of the main reasons why we have engaged with Arctic governance in a different way than in the Antarctic is that at the moment it is a frontier that is being pressed for expansion, whereas the Antarctic is currently maintaining a probably uneasy status quo. Of course there is pressure to remove that moratorium, but this is a bit like triage, to use an unfortunate metaphor. We—and not just us but global climate science and environmental policy—are trying to engage where we feel that engagement needs to take place. It is tactical as well as strategic.

Q180 Lord Hunt of Chesterton: I have a question about your notion of the Arctic sanctuary. You have already commented that these marine protected areas have not been strong and that the UK has not been brilliant either. They are difficult things to do, although some countries like New Zealand have been very successful. Broader than the notion of the Arctic sanctuary, what are the forces that will enable these kinds of sanctuaries or marine protected areas to develop in the Arctic?
Nathalie Rey: There are international commitments already by Governments to establish a global network, so there is a political imperative. There is a scientific imperative in that the sanctuary, the Central Arctic Ocean area, has been identified as an ecologically or biologically significant area by scientists. There is a scientific imperative that says that this area is unique; it is biologically productive; it is an important area for threatened species and biodiversity. There have been commitments internationally. I do not know if any of you have read about the UN report that was released at the beginning of the Convention on Biological Diversity’s 12th conference of parties, which basically says that we are failing quite dramatically on reaching the targets that were set for 2020 if we carry on this track. A huge game change needs to happen and prioritising those areas that have already been identified by science as being important, is going to give clear progress towards putting in place marine protected areas. I think it is challenging, because especially on the high seas there are very few marine protected areas, yet that is why we are calling—

Lord Hunt of Chesterton: Is the Arctic Council pushing for these marine protected areas? You hinted that they discussed it but decided not to do it. Is that right?

Nathalie Rey: They have been talking about marine protection, but the responsibility within exclusive economic zones is on the countries themselves. They have been making very slow progress. There has been no discussion within the Arctic Council for the Central Arctic Ocean yet, but ultimately countries are lagging seriously behind on their commitments on marine protected areas and in particular in the Arctic.

Q181 Lord Hannay of Chiswick: I notice from your evidence that you believe that shooting seismic is a bad thing generally in the Arctic. Surely the line you have taken on this is identical wherever in the world you are shooting seismic to explore underwater reserves. It is no different in the Arctic from anywhere else. There are oil companies shooting seismic all
Greenpeace – Oral evidence (QQ 173 – 188)

Over the world. Without it you would not be able to find fossil fuels. Is there any difference about the Arctic? Do you have any hard evidence that shooting seismic does serious damage to marine resources?

**Ben Ayliffe:** The reason why the seismic in the Arctic is so important to us is that the region itself is so fragile. The baseline science on the Arctic ecosystem has not necessarily been done to the same extent that it has been done elsewhere. We are currently involved in a legal case in Nunavut alongside the Clyde River community, who are bringing a legal challenge against the Canadian Government over seismic testing in Baffin Bay. We can certainly pass on the scientific evidence that we have put together alongside the Clyde River people. The concern is not only the acoustic damage that it does to cetaceans in Baffin Bay but the disruption of migration routes and things like that. That specific risk, coupled with the general lack of scientific understanding of the nature of the Arctic’s ecosystem, is why we are taking such specific interest in this case.

**The Chairman:** Following up a little on Viscount Hanworth’s earlier question, we are not trying to solve the whole issue of climate change as part of this Committee’s work. We could, but what we are interested in is any specific areas of localised mitigation that you feel could take place through regulation or governmental action or anything else. Do you have any examples of those? You might not have any.

**Charlie Kronick:** I am curious to hear what your follow-up question is. I am not quite clear what you mean when you say “specific areas of local mitigation”.

**The Chairman:** Well, black carbon or emissions from vessels that go through. I do not know. If there is nothing there then do not answer.

**Ben Ayliffe:** We would certainly strongly support environmental protection being at the heart of the IMO Polar Code. Similarly, I would assume that there is no reason why, for
instance, the transport of heavy crude through the Arctic should not be under the same sort of regulation that it is in the Antarctic, for instance.

**Viscount Hanworth:** I should uncover what lay behind my previous question. It was the matter of whether or not Greenpeace is trenchantly opposed to nuclear power, because that in the long run is surely a way in which you can staunch the use of hydrocarbons. If Greenpeace have no scenario for the replacement of hydrocarbons, then that rather weakens their position vis-à-vis the drilling.

**Ben Ayliffe:** I do not think an Arctic sanctuary will stand or fall on the basis of our support for nuclear power or not, frankly.

**Lord Moynihan:** I will, if I could, follow up on Lord Hannay’s question, because I think it is a very important one and I am not sure that we have quite got to the bottom of your policy on this. You are arguing that shooting seismic can be damaging acoustically and affect migration routes. Those were the two arguments that you put forward, but they apply equally to shooting seismic off the Isle of Wight. Is there a firm Greenpeace policy about shooting seismic for oil and gas activity anywhere in the world?

**Ben Ayliffe:** No. We have one on the Arctic.

**Lord Moynihan:** But, again, logically why would you apply it to the Arctic and not apply it to offshore Isle of Wight?

**Charlie Kronick:** At the moment neither Greenpeace nor anybody else, as far as I know, is calling for a ban on drilling for oil offshore of the Isle of Wight. There are plenty of people on the Isle of Wight who might have a view on it. But to be as clear as we can be about this, the Arctic is a key threshold, a key frontier, for the oil industry, a key indicator of climate change. As much as we have a policy—Governments have policies and Greenpeace has practice, I
guess—we are very definitely trying to find outcomes, and the outcome that we are after is a ban on drilling for oil and gas in the Arctic. Seismic is a part of that.

**Lord Tugendhat:** Sorry, can you repeat what you just said?

**Charlie Kronick:** I will try. I always try to repeat exactly what I said but I cannot guarantee I will do it word for word. The objective of the Greenpeace campaign on protecting the Arctic is to call for a moratorium initially and a ban on drilling for oil and gas within the confines defined by Ben earlier. The enabling conditions, whether it is allowing seismic shooting or reducing the requirements for drill rigs from two down to one for drilling relief wells—any of the things that make drilling in the Arctic for oil and the ultimate production of hydrocarbons in the Arctic more likely—is something we are working very hard against. It is not that we have a particular view—certainly I do not, nor do any of my colleagues—on the global significance of seismic testing in the context of the whole oil and gas industry. We are talking very specifically about the Arctic here today.

**Q182 Lord Soley:** I think we are on a difficult question for you in a sense. My concern about Greenpeace is not the outcome of an agreement about climate change. I am absolutely with you, but there is something odd about always going for what I would call the big bang solutions: moratoriums or whatever. The question is: would you not be more effective looking at practical, immediate local mitigation centres? Climate change does not start in the Arctic; it starts everywhere else and causes a problem in the Arctic. I have seen Greenpeace make assumptions so many times about science that have proved to be wrong. Surely the case for local mitigation and the case for you putting those forward is much more practical and realistic and therefore more likely to work?

**Ben Ayliffe:** The Arctic campaign is not the only campaign that Greenpeace runs. We run strong campaigns on things like coal in India, deforestation, all these things.
Lord Soley: Big bang things.

Ben Ayliffe: No, it is all about climate mitigation as well. The Arctic is at the frontline of climate change. That is why we are there to stop it being open to drilling. I would add that we do work very closely with the licensing and regulating of oil and gas in the Arctic nations to make it as strict as we possibly can.

Lord Soley: But if you had your moratorium, the Arctic would still be in trouble because the problem is outside the Arctic.

Ben Ayliffe: Of course it would be, yes. That is absolutely right. We completely agree that the Arctic, as I said before, is fundamentally changing, but I do not think inaction is acceptable. Alongside the Arctic campaign, we have an international climate campaign that is looking for stronger regulation on the release of greenhouse gases.

The Chairman: I think we are getting into a discussion about Greenpeace tactics or otherwise and it is not really what this Committee is doing.

Charlie Kronick: We would happily carry that on at some other time.

The Chairman: It is a great conversation that we could have maybe down the pub another time, but I do not want to get any further down that just at the moment.

Q183 Lord Addington: Now I think we come on to the thing about Greenpeace’s work with indigenous groups. We have information about your relationship in Canada with the Inuit population, and little banners saying “Go away greenshit” is not a great endorsement of your public relationships there. How are you looking to work with other groups in the entire spectrum? Would taking their views into account locally be a good way to go on from this? Are you going to consult more closely in any future planning you are going to do?

The Chairman: Generally, how do you feel that we should deal with this whole issue of indigenous people, not just from your own backgrounds?
Ben Ayliffe: Greenpeace’s position is that the Arctic peoples should be at the heart of decision-making in the far north. That is absolutely central to what we do. We have no permanent friends and we have no permanent enemies, and that is the same in the Arctic. Of course there are people who disagree, indigenous communities who disagree with things that we have done in the past. That is not to say that we would agree with everything that happens among Arctic peoples, but obviously we are making concerted efforts to work as closely as we can with Arctic communities. I would also point out that the people of the north are not one homogenous bloc. In 2010 and 2011, we got a very rough ride in Greenland. I was part of the work up there, but in Greenland now the steps that we have taken to engage with the Inuit people, the Government and schools and the tours that we do up there have changed the view of Greenpeace. I am not saying that we are loved by everyone, but we are making small incremental steps in improving our relationship. We have released a report on alternative development possibilities for the Greenland people and elsewhere. I just mentioned the Clyde River people in Canada, who we are working together with us on a case involving seismic testing. We have a very strong relationship with the Komi and the Nenes people of Russia and the Sami people in Finland. We completely understand that working with indigenous communities in the far north is central to the ultimate goal that we look to achieve.

Charlie Kronick: Can I add a couple of things? First of all, I think the historical antipathy to Greenpeace, particularly in the Canadian and North American Arctic, has been around the indigenous seal hunting and whaling. Greenpeace in Canada, internationally and in the UK has publicly acknowledged that our historical position was wrong.
The Chairman: It was my fault as Chair when I looked through these questions – this one again is too much about Greenpeace and not enough about indigenous people, so I apologise for that.

Charlie Kronick: I wanted to move on and come back to the investigation.

Q184 The Chairman: Perhaps we could move on to how Greenpeace feels the international community and the specific Arctic states should deal with those problems, or maybe you do not think that there are any?

Charlie Kronick: Development in emerging economies where there are low incomes or low provision of healthcare and education are global problems and not just Arctic problems. What is interesting about the work that was commissioned from the University of Copenhagen about development in Greenland was that it does look at extractive industries. There is no sense that there can be a complete absence of extractive industries, so that means there is potential for manageable mining. I will not use the word “sustainable”, because in the end it is a resource that can be exhausted. Is that sustainable? I have no idea, but it certainly can be managed. The same is true of sealing and other things, and of course fisheries is an extractive activity that already provides the most economic benefits to those countries and communities. I do not think there is any question that those things can contribute and increase their contribution to development in those regions.

Now there is potentially, certainly as far as oil extraction goes, a conflict with commercial fisheries for a global market but also for indigenous and aboriginal sustainable whaling and other fishing activities. So we would argue that the question that needs to be asked and the conversation that needs to take place is between those Governments and the indigenous peoples of their countries, which may or may not have a particularly open and robust dialogue at the moment. It is certainly not true in Russia and parts of Canada and Alaska,
where the national Governments are not taking anywhere near seriously enough the aspirations and current activities of those indigenous people.

But we would argue that the real threat to growth there is potentially, first of all, ongoing climate change and, secondly, the local implications of a pretty severe accident, particularly from oil. So the tension is there, absolutely, but it is not between environmentalists and development; it is between which development pathway is going to deliver the most to those communities and whether there are other ones that will get in the way of that. That is a role for the Arctic Council but, more importantly, for the national Governments.

Lord Addington: Carrying on from, I have a supplementary question that comes in here that I was trying to get to. If you agree that you have made mistakes in the past, and it is good to see that you do, and that some of these mistakes and some of the positive things have been made by Governments, which models do you think the British Government should be supporting? Where do you get the best results from? If you have had bad experiences, presumably we can learn from them.

Charlie Kronick: Maybe this is the best way to answer the question. Our bad experiences were from imposing our values and our expectations on a set of communities that we did not consult, where we did not have relationships and we did not know the outcomes that those communities themselves wanted. That was the case particularly with indigenous whaling and sealing. Where Governments, whether it is the UK Government or the Governments of the littoral states, can be most effective is by engaging with those communities and trying to establish a development pathway that meets the local and regional economic as well as environmental and cultural needs.

Lord Addington: That is an aspiration. Do you have a practical example that we could refer to?
Ben Ayliffe: It is anecdotal and we would be happy to provide more evidence on this. We can happily put down more information about how we have gone about trying to improve, say, the relationship with Greenpeace and the indigenous communities.

Lord Addington: Not just yourselves.

Ben Ayliffe: No, sure. What I mean by that is that my colleagues in Greenpeace Nordic who run that side of the work will have much more of an understanding. We are happy to provide something.

The Chairman: We accept that invitation. If you would do that, it would be very useful to us in connection with the very good point made by Lord Addington about actual examples of things that you feel have worked well. I do not think we have many of those in our evidence so far.

Q185 Lord Hannay of Chiswick: Could we look at fisheries again? We have touched on it very briefly, but now it is more central to this question. First of all, could you say a little about what Greenpeace sees as the likely implications for fisheries of the present trajectory in the warming, the melting of sea ice and so on? Secondly, could you say something about what you think the appropriate governance arrangements would be, such as regional fisheries agreements and high seas agreements, if a much larger amount of sea, including the high seas, becomes capable of being fished in? Finally, a third point, could you comment on the relevance of the fisheries meeting that took place between the Arctic Five—the five littoral states—in February this year? Can the five in fact aspire to regulate fishing on the high seas? That is surely beyond their reach, is it not?

Nathalie Rey: Commercial Arctic and sub-Arctic fisheries are very valuable, with millions of tonnes of fish per year. There is increasing evidence that the fisheries are being affected by the shifts in distribution patterns of fish stocks, and we are seeing fleets increasingly going
further north fishing into previously unfished areas, especially on the Atlantic side of Arctic waters. In 2009 the US Government, through the North Pacific Fisheries Management Council, issued a moratorium on commercial fisheries because of climate change as a precautionary approach, not knowing the impacts of fisheries on that area. In 2011 the Canadian Government, with indigenous residents, froze the expansion of fisheries into the Beaufort Sea. That was in response to the concerns about the impact of these trawlers on the environment and indigenous peoples’ livelihoods.

The nature of the Arctic area is very fragile. It is very vulnerable to bottom trawling, the very destructive fishing practice that drags very heavy nets on the seabed, destroying cold-water corals that take hundreds of years to develop. These are very vulnerable and important habitats for fish stocks and there are non-commercially targeted fish stocks that are being caught as by-catch. Those fish often play a very important role within the Arctic marine food chains. So there is a real problem there. At the same time though there are not much data. We know very little about the areas. Many areas have not been mapped yet and the fishery data are very scarce as well. This scientific uncertainty of what is happening there means that we need to take a very cautious approach to expanding the fisheries.

As you said, there are not the appropriate governance arrangements for the area. The Central Arctic Ocean is not covered by a regional fisheries management organisation. There are some international agreements that have articles that are relevant to fisheries but nothing specific to the Arctic. There are some regional agreements but there are also gaps in coverage there. Greenpeace has been calling for a moratorium on the industrial scale fishing from north of south Svalbard and St Matthew Island and the high seas areas. Ideally we want a sanctuary in the Central Arctic Ocean that would not allow any fishing because of the vulnerability of this area to fishing practices.
The fisheries meeting that you were referring to was the US Government-led initiative. Since 2008 they had a resolution wanting to ensure a moratorium on industrial fishing in the Central Arctic Ocean and to get agreement with their Arctic neighbours. They were trying to get countries on board at the meeting they had at Nuuk. This was a closed meeting of Governments. We have heard that it was Russia especially who were not too keen on the idea of a moratorium, but the countries have agreed to put in interim measures. Until they see that that the area is open to fisheries, they will just not agree to a moratorium yet, but only to interim measures.

What we have been calling for, and what is needed, is a regional oceans management organisation covering the Arctic region, not just for the Central Arctic Ocean but the EEZs of the Arctic coastal states. There is an interconnectedness of all the waters and it does not make sense to have an agreement covering just a small portion. It would be pointless if just the Central Arctic Ocean was protected but other areas did not have similar protection, because you have to take an ecosystem-based approach.

**Lord Hannay of Chiswick:** Thank you. That is very helpful. But do you not think that there is a slight liability for confusion and contradiction between ideas such as moratorium or sanctuary and ideas for a regional fisheries regulation, which after all will presumably envisage the catching of some fish but in a regulated and controlled manner? I confess to you that I have much more sympathy with the second than the first in that respect. I think your objective of looking for a regional agreement to regulate fisheries before the fish stocks are seriously damaged is a thoroughly laudable one, but is there not a contradiction or a conflict between that and talk of sanctuaries and moratoriums?

**Nathalie Rey:** We are calling for an oceans management organisation that does not only deal with fisheries but with all extractive activities happening there. Part of that oceans
management organisation should also deal with the importance of marine protected areas, which are the cornerstone of an ecosystem approach. If scientists have identified these areas within the Central Arctic Ocean, and it is practically the whole of that area, as an ecologically or biologically significant area, that should be part of such a body’s responsibility to protect them: regulating fisheries also.

The Chairman: Which are the major fishing nations there at the minute? Who is going up there with large ships? I do not mean the local populations. Who is going out up there?

Nathalie Rey: The Greenpeace ship tours in 2010 and 2014 have seen mainly Russian fishing vessels going up there, but the distant water fishing nations are also watching developments closely.

The Chairman: So the Chinese, the Spanish, the other major fishing nations are not there at the moment?

Nathalie Rey: No, not that far north yet.

Viscount Hanworth: Presumably the crucial issue is the distribution of fish stocks. I was somewhat doubtful of fish on the high seas or the central Arctic region. Maybe it is a question of extending the territorial waters to encompass the fish stocks. Would that not be the appropriate recourse so that each littoral nation could be charged with defending its own fish stocks? The problem now is that it is the tragedy of the commons; everybody gets in there before the other person can pre-empt the fish.

Nathalie Rey: If you are extending your territory with the claims that have been put through the UNCLCLS, that only covers the seabed. That does not apply to the water column above, so that would stay high seas. It is possible, though, if you are sharing fish stocks and resources, for countries to come together to agree to put a regional fisheries management organisation in place. There needs to be a co-ordinated approach between the countries. It
is not just a case of countries taking national action; they need to co-ordinate, because often you are sharing the same fish stocks that can be highly migratory as well.

**Viscount Hanworth:** But there are limited coastal waters from which you can exclude other nations.

**The Chairman:** Viscount Hanworth, we have two more issues that we need to go through. Fisheries is an important area that the Committee will be moving on to in a couple of weeks’ time.

**Q186 Baroness Neville-Jones:** I am advised that I need to repeat what I said in our previous informal session about declaring my interest as a member of the Engineering and Physical Sciences Research Council.

Could we turn to British policy, which you take up in your submission to us in paragraph 62, which you describe as being incoherent? Could you elaborate a little on what the incoherence of British Government policy consists in?

**Charlie Kronick:** I will do my best to be coherent. The UK has an internationally expressed commitment to a global average temperature increase of two degrees or less, which was expressed in the Copenhagen declaration and has been reiterated since. Through the Climate Change Act there are legally binding commitments to reduce our carbon emissions and the recommendations linked to that Act virtually decarbonise our power sector by 2030. So there is a very strong domestic agenda to reduce both our global contribution to climate change and our national activities that will add to climate change. On the other hand, the Foreign Office’s policy document on the Arctic, which I believe came out at the end of 2013, expressed a pretty strong commitment to facilitating the further expansion of the extractive industries, particularly in the Arctic, on the basis that that was good for UK plc and in the national interest.
Greenpeace – Oral evidence (QQ 173 – 188)

We would argue quite strongly that that represents a fundamental inconsistency in the outcomes that the UK Government would like to see. The Chair has referred specifically to the Environmental Audit Committee from the other place expressing a view on a moratorium. The Government response to that request or recommendation for a moratorium was that it was in the UK national interest to pursue at least the possibility of extraction in the Arctic. We really do feel that those two objectives are incompatible, largely for the reason that if there is to be economically successful exploitation of Arctic hydrocarbon reserves, it will be at the cost to the global climate. It is a clearly expressed position from the UK Government that they are working in the opposite direction.

Baroness Neville-Jones: Do I understand from that that you take the view that any country that does not support a ban on hydrocarbon exploration in the Arctic would be pursuing an incoherent policy from the point of view of climate change? That seems to me to be what it amounts to, which is most countries.

Charlie Kronick: Absolutely.

Baroness Neville-Jones: I see. All I would say is that I think climate change policy goes a great deal wider than simply whatever one might say about policy in relation to the Arctic.

Charlie Kronick: I could not agree more. It extends far wider, but the specifics of exploration for oil largely, and to a lesser extent gas, in the Arctic is absolutely inherent in what would represent a coherent policy globally as a response to climate change. There is no question that the economic or the reserve replacement imperative for adding oil and gas reserves puts a huge negative pressure on the likelihood of a successful climate outcome. That is exactly why Greenpeace has focused its work on the Arctic, because it is both a pressure point for future investment or current investment and it is at the frontline of the climate change that we are already experiencing, never mind the future impacts.
**Baroness Neville-Jones:** As has been previously said, of course, the Arctic is not the origin, it is the victim, of climate change.

**Charlie Kronick:** Absolutely, and if this was the only place we were working on—

**Baroness Neville-Jones:** I would like to move on. You list a whole series of things, huge areas of policy I might say—important ones, I entirely agree—where you think HMG ought to be more active. You do not say in terms that the UK ought to be supporting a ban on hydrocarbon exploration. I would like to ask you about the other things that you recommend the British Government ought to be doing, which is not after all a member of the Arctic Council or really an Arctic power. Would you prioritise between the various things that you have listed? Some of it is fisheries, some of it is other agreements. I suggest to you that Governments are more effective if they seek to do things where they could be really effective and not try to do everything, particularly when the countries more directly concerned are not necessarily going to co-operate.

**Ben Ayliffe:** Looking at the policy document, my focus is on Arctic oil, and there is a very clear and present threat from oil companies in the Russian Arctic and the Norwegian Arctic. We think that should necessitate a response from the UK Government, as they say, to advocate for the highest environmental drilling standards. I am not clear what work the FCO has done to advocate or support that. I am not aware of anything, so that would be a good start. The main thing that I would urge is visible action—a statement that, “We believe strongly that there should not be drilling in the icy waters of the Arctic”. That would be a start, but beyond that there is fisheries management. I think the role that the UK will play in the lead-up to the COP summit in Paris will be important. But we are more interested in seeing real evidence of action first and foremost.
Q187 Lord Soley: I think you have largely covered some of this, but when I mentioned the problems you had with Russia, which did seem rather drastic, you indicated that you had problems with other countries too in the Arctic. Can you tell us something about how the other Arctic states are reacting to Greenpeace’s arguments and how much they see it as a threat to their economic interests?

Ben Ayliffe: I think that depends on where you are. The Finnish Government, for instance, have publicly backed the call for the creation of a sanctuary. If you had told me 18 months or two years ago that we would have an Arctic Council member doing that I would have laughed. I think that is an indication that there are movements. We have heard positive signs coming from Sweden, but we are not blind to the fact that there is a degree of entrenched self-interest certainly in Canada, Russia and Norway. We are gathering support with people around the world, and the campaign that we are running is trying to involve people in decision-making in the north. We have generated a lot of support within Arctic nations for our campaign.

Lord Soley: What are your problems with Norway?

Ben Ayliffe: Norway has, on the face of it, a very proactive approach to environmental sustainability, but that is not quite backed up by the actions of Statoil. We tried to stop their drilling in the Hoop field in the Barents Sea this summer through a variety of non-violent direct action and legal challenges. We think it is slightly odd that you would have a Government who are pushing for climate mitigation elsewhere in the world at the forefront of drilling in the Arctic. Again, their rhetoric does not match their actions.

Lord Soley: Could their argument be that they think they can manage it, whereas you think it should not happen anyway?
Ben Ayliffe: We do not think they can manage it. As I said before, we do not think their drilling standards are robust enough to deal with the technical challenges that they will face up there, but of course there is the climate imperative too.

Lord Soley: I am talking simply about what the difference is. They take the view that they can manage it; you take the view that they cannot. That is the core of your argument?

Ben Ayliffe: Yes, and they should not.

Charlie Kronick: Can I just add a tiny bit? I know that we are close to the end. I think the question that you have raised is an interesting one, and I think it also comes back to Baroness Neville-Jones’ question about where interests lie. Part of the UK interest, for example, is in direct economic interests. BP is a very significant holding in UK pension funds. It is not as significant as it was before the Deepwater Horizon in terms of being a dividend payer, but it is still a highly valued company in the UK economy. It owns 20% of Rosneft, one of the Russian national oil companies. I would say that a catastrophic outcome for Rosneft will have significant direct economic impacts in the UK because of BP’s holdings.

Lord Soley: I think we are on to a circular argument here, frankly, but the issue is really that we have very direct economic interests in seeing climate change reversed.

Charlie Kronick: That is exactly the point I was trying to make.

Lord Soley: Well, yes, but if we are going to do that there are different ways of doing it.

Q188 Lord Hunt of Chesterton: You are calling for some new international body, this management of the oceans, and there are various existing ones, the international body dealing with oceans, OSPAR. Why are you advocating for what sounded like some new international ocean bureaucracy when we have quite enough already?

The Chairman: A one-sentence answer maybe from the three of you.
Nathalie Rey: OSPAR only covers a very small portion and there are other bodies that are not specific to the Arctic. If you want to have a co-ordinated and coherent approach to the Arctic, then you need to have a body that is actually focused on the Arctic itself.

The Chairman: I think that is a good answer. Was there anything else you wanted to add?

No? Thank you very much. It has been a very good evidence session, with some good penetrating questions and some excellent answers as well. Thank you very much indeed. At this point I bring the public evidence session to an end. Any members of the public listening or in the room, thank you for attending.
Q284 The Chairman: Colleagues, we have a copy of Denmark’s Arctic strategy, which is being distributed as it may be referred to. We thank the ambassador for providing it.

Your Excellency, I am very pleased to welcome you to the House of Lords Arctic Select Committee. This is our 22nd evidence session. We have had some other ambassadors give evidence as well. We very much welcome you. I think you have had a copy of our interests, so you are aware of those. We are being broadcast. Can I ask you to introduce yourself briefly? We will then move straight into questions.

His Excellency Claus Grube: Thank you very much, my Lord Chairman. My name is Claus Grube. I am the ambassador of Denmark to the United Kingdom and its dependencies. I took
up my present function on 1 October last year. Before that I was the Permanent Secretary of State for Foreign Affairs in Denmark from 2009 to 2013. Before that, I was Permanent Representative to the European Union for a number of years from 2000. Before that, I held a number of different positions within the Danish Ministry of Foreign Affairs.

The Chairman: Thank you very much, Ambassador. I will start with quite a general question and ask what the current Danish priorities for the Arctic are. Perhaps a more tricky question is: to what extent are those priorities shared by the Governments of Greenland and the Faroe Islands? How does Copenhagen work with Greenland and the Faroe Islands to develop policies towards the Arctic? That will give you an opportunity to describe, in terms of the Arctic, the relationship between Denmark and Greenland in particular.

His Excellency Claus Grube: With great pleasure, my Lord Chairman. I do not consider the question tricky at all. In this context, the priorities of what we call “Denmark” refer to the Kingdom of Denmark. That includes Denmark and our two self-ruled areas, Greenland and the Faroe Islands, so when I talk about Denmark in the context of the Arctic, I am talking about the Kingdom of Denmark.

The present strategy for the Kingdom of Denmark, of which I have provided you with a copy, was adopted in 2011. It was agreed by all three parts of the kingdom: the document you have before you was signed by the leaders of Greenland, the Faroe Islands and Denmark. That is the basis for our engagement in the Arctic. We have very close co-operation, on a day-to-day basis, with Greenland and the Faroe Islands on all the Arctic issues, and also relating to our participation in the work of the Arctic Council.

Our overall strategy for the Arctic focuses on four key areas. Whenever I talk about the Arctic, you should bear in mind that, for us, it is primarily about the peoples of the Arctic, of which, of course, our populations are part. The first and foremost priority is a peaceful,
secure and safe Arctic; secondly, self-sustaining growth and development for the Arctic people; thirdly, development with respect for the Arctic’s vulnerable climate, environment and nature; and fourthly, close co-operation with our international partners, of which the United Kingdom forms part. As you will see, our strategy contains approximately 75 concrete goals, which are pursued in our day-to-day work on Arctic issues. We do that in the Ministry of Foreign Affairs in Copenhagen, in close co-operation with other relevant ministries and with the Administrations in Greenland and on the Faroe Islands. As I said, the overall focus of our strategy is the concerns and matters of the people of the Arctic region.

We want to see the Arctic preparing, as a region, for economic development in a fragile environment. We must take care to balance the legitimate right to economic development in the region with respect for the environmental fragility of the Arctic area. That is basically our overall approach.

The Chairman: For total clarity, is the economic development of Greenland a totally devolved activity as we would understand it here, over which Copenhagen has no influence whatever? Is that a good picture of it?

His Excellency Claus Grube: It is a little more complicated than that. Since the middle of the 2000s, Greenland and the Faroe Islands have had what we call self-rule, which is an agreement between Denmark, Greenland and the Faroe Islands respectively. These agreements are not necessarily identical. The areas of competence transferred from Denmark to the Faroe Islands and Greenland are not necessarily identical because, of course, they themselves can choose which areas of competence they would like to transfer in order to administrate, legislate and finance the areas themselves. That does not go for foreign and security policy, for monetary matters, for defence, or for the constitutional
construction of the Kingdom of Denmark. As far as the possibility of using natural resources goes, Greenland took over the competencies for administrating that in 2010.

The Chairman: Thank you, Ambassador.

Q285 Lord Hunt of Chesterton: I have two quick questions. I noticed on page 44 of your document that you had a subsequent report focusing on snow, water, ice and permafrost in the Arctic. One of the things that I noticed in the earlier reports, with which I was more familiar, was that permafrost was not emphasised. For many people that now seems a critical issue, both for the people who live there in Russia and in Greenland, but also because of the release of methane, which has an enormous impact for the whole globe. Is Denmark focusing on that?

My second question relates to the melting of the sea ice. Denmark has an enormous merchant fleet—much larger than that of any other European country. What is its view about exploitation of the Arctic sea route?

His Excellency Claus Grube: My Lord Chairman, the inclusion of permafrost comes from the recently publicised latest report from the UN climate change panel. It is of course an important issue. Already during this Canadian presidency of the Arctic Council a taskforce has been set up to look into the issues relating to both soot and methane. They maintain that these can be released from the ground when permafrost thaws due to climate change and heating. We participated in that work. It is an issue to which we are very attentive, as with all the other issues that relate to climate change, because it could effect not only the Arctic region but other parts of the globe.

There is often a lot of hype when we talk about shipping, and in relation to climate change and de-icing. We know that some commercial routing has taken place through the north-east route from the Bering Sea along the coast of Russia to Vladivostok and the Pacific. We
know that the Russians are providing for this route to be open during the summer period, with the help of ice-breakers if necessary.

The Northwest Passage along the Denmark strait and up into the Davis strait is a more long-term perspective, to my knowledge, because the de-icing effect is not sufficient and there is insufficient open water there, even in summer periods, to make that a viable commercial route in some future. However, there is a lot of interest north of the route north-east from Tuva and Harstad. We can see increasing activity not so much in commercial shipping but in cruise ships and things like that, notably in relation to the east coast of Greenland, and of course that is something that we also work actively on.

Lord Hannay of Chiswick: Could I go back to the previous question, Ambassador, and ask whether you have any views on the likelihood in the period you are taking about, let us say up to 2020, of Greenland wishing to become independent? If that were so, would that have rather important implications for NATO?

His Excellency Claus Grube: I would call that a very good question, my Lord Chairman. Of course the self-rule agreement that we have does not entail independence. That would be a separate political discussion in that event, which of course also presupposes that the Greenlandic people and the Government wish for that. But if that should one day prevail, of course the Danish Government will have to look into the matter and see how we will deal with that, but that will be for political discussion at that time. That will also, of course, affect our constitutional construction. Personally, within our strategy for 2020, I do not see it as a real possibility. Of course I could be wrong, but if you suppose in your hypothetical question that you also have a certain degree of economic income to run a relatively well developed modern welfare state in Greenland, which comprises approximately 50,000 people, with an infrastructure that is extremely complicated—there are basically no real roads between the
cities; you have to sail or fly—you would have to look to the much more distant future if you were to do that.

There has also been a lot of hype, and I would like to use the opportunity to mention the possibilities of access to natural resources in the Arctic region, including in Greenland. One has to bear in mind that all this has to be done through commercial investment and commercial companies. That also presupposes that you have prices for raw materials—oil and other natural resources—that make such investments realistic. Just today we have an oil price that is below $80 a barrel, which may make even shale gas developments less viable. Having these economic developments in these regions is a longer-term perspective, and it is extremely difficult to have commercial activity in these regions.

Viscount Hanworth: I believe that the population of Greenland is the same as that of the Faroes, which is an extraordinary disparity if you think of the size of the land-mass. Do the Faroes have the same economic prospects, or do they have any interesting economic prospects, comparable to those in Greenland?

His Excellency Claus Grube: The Faroe Islands are a different land. They have more or less the same number of people, but they are very different economically. Their structure is different and they have a more developed fishing industry and more developed agricultural production. They have a more diversified economy. There is also some industrial production and services, and they are, of course, also prospecting for gas and oil in a part of the Atlantic Ocean that is closer to the United Kingdom than Greenland.

Viscount Hanworth: So there would also be some inward investment.

His Excellency Claus Grube: Yes.

Q286 Lord Hannay of Chiswick: Could we look at the Arctic Council now, Ambassador? Could you tell us about Denmark’s views on recent developments, in particular the move of
the Arctic Council, or rather of its members, to make binding treaties on oil spill response and search and rescue? How would Denmark like to see the Arctic Council develop in the future? Do you see any sort of trend towards an almost decision-making body?

**His Excellency Claus Grube:** We think that that development in the Arctic Council has been very positive. We are going towards a more binding form of agreement, from decision-shaping to decision-making. For Denmark, the Arctic Council remains the primary forum for discussing issues relating to the Arctic apart from security policy, which does not form part of the Arctic Council. For us, as you can see from the Danish strategy, it is key pillar of our strategy, so it is important that we ensure close international co-operation on international issues with all interested parties. We have had a positive experience with the Arctic Council since its creation in 1996 under the Ottawa declaration, and we focus very much on concrete co-operation in areas of mutual concern that you mentioned correctly, such as oil spill response, search and rescue, and the Arctic Economic Council, which has been the latest new development during this Canadian presidency. Everybody has an interest, I would say, in co-operation in the Arctic. No one can do it alone in light of the large and uninhabited areas, the extreme weather conditions and to some extent the very difficult meteorological conditions. That is also why Arctic scientific research requires, in our view, international co-operation. We also think that the developments in the Arctic can have effects, as also mentioned, on the entire planet, notably in relation to climate change. From a Danish perspective, we see no reason why this co-operative environment should change. Economic development enhances the incentive to co-operate through international institutions and helps to stabilise the region.

The question about the future is another good question. I have no clear answers as to the future of the Arctic Council as such. It is still a young body, created, as I mentioned, in 1996,
and we look forward to the American presidency next year and to seeing what kind of
priorities it will decide for its dealing with the Arctic Council.

However, we see one common challenge: distances are huge in the Arctic, maybe much
greater than you realise. In our view this calls for better use of telecommunication, satellites
and energy resources. This could be an area where the Arctic Council could contribute with
circumpolar solutions and/or exchange of best practices. But when we talk about the Arctic
Council, we also have to bear in mind that it is not an international organisation per se; it is
basically a forum for co-operation, with a small secretariat in Tromsø.

**Q287 Lord Tugendhat:** I also have a question, Ambassador, on the Arctic Council. What
effect do you think the increase in the number of observer states has had, and what
contribution do you think observer states such as the UK should make to the Arctic Council?
Are there any particular areas where the UK could, in your view, contribute more?

I then have a follow-up question once you have dealt with this.

**His Excellency Claus Grube:** Denmark has always supported observer states’ access to the
Arctic Council. We consider it important that all countries that might have an interest in
sharing the co-operation and development of the Arctic region with us should have the
possibility of participating in the work of the Arctic Council as observers. We are very happy
that we have been able to enlarge the number of observers in the Arctic Council lately. It is
still early days for the new observers, but we are still working on a more concrete
engagement with them in the day-to-day work of the Arctic Council.

The Arctic Council provides a platform of joint efforts. That goes not only for the member
states but for the observer countries. At a meeting during the Danish presidency, we
established the so-called Nuuk criteria for becoming an observer: you not only abide by the
Arctic Council as the prime forum for co-operation but share the basic principles of our
approach to the Arctic. For us, it is important that the observers—this can also go for local communities and non-governmental organisations—participate in what I would call inclusive governance on the Arctic. No other forum can provide this high level of engagement with the Arctic states. I also noticed with satisfaction that it was stated in the British Government’s Arctic policy that they share the view that there is no need to develop special international instruments to deal with that. That is basically how we see it.

We therefore favour strengthening regional co-operation and the inclusion of observers, as I said. We also hope that the European Union can become an observer to the Arctic Council as soon as possible. This openness is very positive for all the countries and actors. We think that it brings economic and strategic benefits to our work. Many observers, such as the United Kingdom, possess scientific, technological and economic abilities to contribute to politics in the Arctic region, which we can only welcome. That is one of the reasons for the success of the Arctic Council: we have inclusiveness vis-à-vis all interested countries. That is why it has been able to evolve and maintain a central role as the primary venue for co-operation in the regions, despite the fact that the Arctic is becoming a more dynamic environment.

We would welcome any contribution from the United Kingdom. We also hope that the observers will engage with the more technical work of the different task forces that have been set up in the Arctic Council. The UK has been a long-standing observer in the Arctic Council. The Arctic policy that the UK adopted in 2013 was a very constructive and well balanced document that opens up many good possibilities for the UK to be an active participant in that work.

**Lord Tugendhat:** Thank you, Ambassador. In the light of that, what about the EU having permanent observer status in the Arctic Council? Would Denmark welcome that? As the only
EU member in the Arctic Council, do you feel that you speak not only for Denmark but to some extent for the EU?

**His Excellency Claus Grube:** We have supported the European Union as a permanent observer to the Arctic Council all along. It is true that among the so-called Arctic Five—that is, the Arctic coastal states—Denmark is the only member of the European Union, but among the eight members of the Arctic Council, Finland and Sweden are also members of the European Union. They also support our work for permanent observer status to be given to the European Union. You know very well that we had an issue relating to Canada and to the seal hunting ban. That matter has been brought before the WTO. A panel has decided on the matter. We hope that we will be able to take a positive decision soon.

**The Chairman:** We will come on to that specific context as we move through the questions. In fact, we will move on to it now with Lord Addington.

**Q288 Lord Addington:** Hello Ambassador. What view does Denmark take of the EU ban on seal products? Do exemptions to the ban that are intended to support the indigenous people work effectively? Do you welcome the progress made on matters in recent Canada-EU negotiations? Will the outcomes of these negotiations have a practical effect in Greenland? Could you also comment on the enforcement of any indigenous capture of seals and the policing of that? That might help with the answers that you give.

**His Excellency Claus Grube:** Let me just generally say again and remind you that our strategy is based on ensuring that the peoples of the Arctic can maintain a decent and sustainable way of living. Seal hunting and whaling form part of their indigenous traditions. We participated very actively internationally in dealing with the sustainable development of marine resources, including marine species, but it also has to be borne in mind that we
sometimes wish that people had a greater understanding of the need for and maintenance of these cultural traditions.

That is my long introduction, Mr Chairman. I am sorry about it, but that is why we would have preferred it if there was no ban on seal production and products. We of course acknowledge the wish for that internationally, but that is also why we were adamant that we could have and maintain the so-called Inuit exemption to make it possible for the peoples of Greenland and other indigenous people in the Arctic to maintain their way of living. Unfortunately, the marketing of seal products has not been as successful as one could have hoped, because of the more general negative attitude to seal hunting created by the seal hunting ban. That said, we find it positive that a solution has been found with Canada on the issue of the seal ban and we hope, with the lifting of its reservations towards EU observer status, that we can, as I say, move fast to agree to that. For us, it is important that the whole issue of the seal hunting ban does not give rise to negative consequences for the Greenlandic peoples’ interests.

Lord Addington: If there was some expansion of seal hunting, particularly by the indigenous people, can you see any way in which that could remove the dangers of large-scale hunting, or any way in which it can be policed? The policing of it is something that we have not really heard about.

His Excellency Claus Grube: The policing of it is dealt with by the Greenlandic authorities, in my view in a very controlled way. You have to have a licence to hunt. It is a perfectly well controlled administration. You also have to bear in mind that the total population of Greenland is 50,000 people, out of which maybe 1,000 or 2,000—I do not know the exact figure—are hunters living from seal hunting. It is not a very large-scale operation.
Lord Addington: Sorry to press you on this, but I think it is important. It is the fact that others can come and operate under this that might cause considerable worry and concern about overexploitation of a natural resource.

His Excellency Claus Grube: As I said, if it could undermine the so-called Inuit exception that we have on the seal ban, that would give rise to worry for us.

The Chairman: Ambassador, I think I brought to an early close your answer to Lord Tugendhat on the European Union. Can I just be clear: I presume that Denmark wants the EU to become an observer?

His Excellency Claus Grube: Of course.

The Chairman: Right. Could you say briefly what the added value would be of having the EU on board? What would it add to the Arctic Council, given that it has three EU member states already? Or would the EU be there just to listen and provide cash for bits of research? Is that it?

His Excellency Claus Grube: No, Lord Chairman, it is not only that. For those of us who have followed it, the work of the European Union relating to the Arctic goes back to the middle of the 2000s—2006 or 2007. In 2008 the Commission made its first communication of the European Union’s Arctic policy, with a relatively high level of ambition for activities in the Arctic area through becoming an observer in the Arctic Council. Denmark was very active in pushing forward the foundations of such a policy for the European Union, not least because there was also some interest from other member states—not all of them, but some of them—to be more actively engaged in the work of the Arctic Council. Since then, in 2012 the Commission and the high representative, Catherine Ashton, made a common communication about the further development of the EU’s Arctic policy and its participation in the Arctic region. According to that communication, there are three
headlines for the EU’s policy: knowledge, responsibility and engagement. In more concrete terms, that means that the EU’s main interests in the Arctic can be put under the headings of sustainable development, commercial development, development of maritime transport routes, management of natural resources and fisheries, tourism, research—not least through the Horizon 2020 programme, and the development of the indigenous people and regions of the Arctic.

The Chairman: You have great experience of Brussels yourself, Ambassador. From a personal point of view, do you think Brussels can cope with this? Would it be a good move?

His Excellency Claus Grube: I would personally be very happy with it. Both my Government and I personally have worked actively to develop the policy of the European Union. It makes a lot of sense, for the interests of the European Union, to have this openness and interest towards the Arctic region.

The Chairman: Very briefly, have sanctions against Russia made that an impossible goal in the short term?

His Excellency Claus Grube: I am happy that you have asked that question. No it has not, not in the least, for the moment. We see the Arctic area as an area of co-operation and low tensions. That is also why we are very attentive to maintaining it as such. Up to now, we have also seen Russia taking the same attitude and approach, so up to now we have seen no spillover.

Baroness Neville-Jones: I want to add a short addendum to the question about EU observer status. Is it relevant that the EU has competence when it comes to fisheries?

His Excellency Claus Grube: Fisheries?

Baroness Neville-Jones: Or more directly in the likely future work of the Arctic Council? That obviously affects the ability of Arctic Council members themselves to speak.
His Excellency Claus Grube: Fisheries are always a very interesting subject.

The Chairman: We are coming on to fisheries right now specifically.

Baroness Neville-Jones: Oh, sorry.

Q289 Lord Oxburgh: The ice melts and more sea areas will be open for commercial exploitation for fishing. Does Denmark think that a new regulatory regime is needed here? How should this be handled? We have heard from other witnesses that fish stocks are moving northwards as well.

His Excellency Claus Grube: The present situation, as you probably know, is that there are some international organisations dealing with fisheries in parts of the Arctic area, notably in the north-eastern part of the Atlantic Ocean. Of course, in Denmark, Greenland and the Faroe Islands we have our own conservation and management policy in order to ensure the sustainable use of fishery resources.

We should also bear in mind that there is the normal management of coastal interests by the Arctic coastal states. There is the three-mile zone and the 200-mile economic zone, and within that we manage the fishery resources in a sustainable way. It is true that there are talks among the Arctic coastal states, the Arctic Five, about a regulatory framework for the high seas, but they are talks; we do not know exactly how these talks will go and whether something will materialise. This work has been led by the United States, which will, of course, take over the presidency of the Arctic Council. As a starting point, I believe it is positive that the US has taken this initiative to establish a framework that in time it might be possible to broaden out to include all relevant stakeholders. You have to start somewhere.

Globally speaking, yes, we have some organisations in the north-east Atlantic Ocean that deal with the conservation of fish stocks. ICE is doing the scientific work. There is no international organisation dealing with fisheries in the Mediterranean Sea, for instance.
From a legal and management point of view I would say that there is no major difference between the Arctic Ocean and the Mediterranean Sea, except for the geographic location and the temperature. What area has to be managed remains to be seen. We also have parts of the Atlantic Ocean that are not regulated by any international agreements. In part of the Pacific Ocean there are also fisheries that are not managed. So I would say that it is an open discussion.

In reply to the question raised earlier about the role of the European Union, it is true that we manage the fishery resources within, let us say, the territory of the member states of the European Union. That has brought a lot of scientific expertise on fisheries management into the European Union, which I think will be very valuable for the work of the Arctic Council.

It is also true that the general increases in temperature and the moving of fish stocks, which you also mentioned, will affect fisheries in the future and could also make a larger part of the Arctic Ocean potentially attractive for fishing. I say “potentially”. That, of course, presents all of us with new challenges and raises the question of international regulation, which I mentioned.

One thing I would say is that we would always have as a guideline in our dealing with these issues that fishing should be sustainable and that a cautionary principle should be applied to protect the environment and the fishery resources to the maximum extent.

**Lord Oxburgh:** That is an admirable position, but I think we also have to recognise that not only is the climate changing but the world population is still increasing and the pressure on fishing is increasing, and the fact that we have certain unregulated areas in other parts of the world as it worked in the past does not necessarily mean that this will be right for the Arctic, particularly because the Arctic is so poorly understood as a working ecosystem. As an observer country, my gut feeling is that we would like to be confident that Arctic Council
members were proactive in this and protecting not just their own interests but the interests of the wider marine community.

The Chairman: I can see, Ambassador, that you are nodding to that comment.

His Excellency Claus Grube: Well, of course. That is also some of thinking behind the work that the United States has taken the initiative to do in the Arctic Council. As I said before, we support this initiative from the Danish side, and we hope that it will lead to some sensible decisions in the future. But I also invite all interested observers, including the United Kingdom, to participate in this work.

The Chairman: Baroness Neville-Jones, are you happy that you have what you need on this question?

Baroness Neville-Jones: I am just curious about the extent to which the Arctic Council members, which are also members of the European Union, regard themselves as having sovereignty in this area of fisheries and can make policy reasonably freely, or do they have to refer back to Brussels?

His Excellency Claus Grube: I will not reply on behalf of Sweden and Finland; they have to reply for themselves. But I can reply on behalf of the Kingdom of Denmark. In relation to fisheries and other issues, we can sometimes find ourselves in a situation where we give priority to the interests of our people in Greenland and the Faroe Islands and not to our interests in the European Union.

Baroness Neville-Jones: I see.

His Excellency Claus Grube: There is a declaration in the Maastricht treaty, which we asked for, which makes it possible for us to deviate from the principle of loyalty in cases where we have important interests to take care of in Greenland and the Faroe Islands, which are not members of the European Union. So we have the right to deviate from our EU obligations if
that is necessary in matters such as seal hunting and fisheries, and things like that. Of course we would always prefer not to make those kinds of choices; we would always prefer to influence EU policies in such a way that we would not be in that situation.

Baroness Neville-Jones: Does that choice arise in practice, Ambassador?

His Excellency Claus Grube: It has arisen a few times, but as I say we prefer to maximise our influence in the European Union to such an extent that we can avoid these dilemmas and so that the interests of our peoples in Greenland and the Faroe Islands are taken good care of by the European Union. It has also arisen in issues relating to the International Whaling Commission.

Q290 Lord Soley: Can I turn to search and rescue, particularly around Greenland? It is obviously a critical factor. In answering the question about present capacity, could you take into account the likely increase in tourism, particularly from cruise ships? I might well have a follow-up question, but I will start with that.

His Excellency Claus Grube: My Lord Chairman, that is a very important issue, which was one of the first on which the Arctic Council took up in legal instruments—an agreement that we were happy to negotiate during the Danish presidency of the Arctic Council. It is something to which we are extremely attentive, notably in view of increased shipping traffic and potential future increase. We have been very active in dealing with the search and rescue agreement. We would also very much welcome international co-ordination in this if necessary.

There are no abundant resources for search and rescue in the Arctic area. When you look at the Arctic area geographically you will notice, as I said before, that the distances are enormous. There are often long distances between populated areas. If you sail in these waters, you will often find yourself very far away from inhabited coasts and the physical
location of search and rescue materiel. We often have to rely on planes, helicopters and ships for search and rescue operations, notably if you are outside the three sea-mile zone. Is that capacity sufficient? There is no limit to how much capacity you can use in these circumstances. My personal feeling is that problems could arise in the case of a major disaster, notably if you are far away from where the search and rescue ships or planes might be. You have to realise that to move from the east coast to the west coast of Greenland is approximately a one and a half hour flight; it is 1,500 kilometres. If you have an accident along the east coast of Greenland, which is not very inhabited, you can have sailing times of one or two days before you arrive. If you are going down with a ship or another accident is happening, in waters where the temperature is between 0 or 2 degrees centigrade, it is going to be very difficult. That is also why we are very happy with the work that is progressing very positively in the IMO on the so-called Polar Code. Agreement has now been found on the security part of the code and I know that work is ongoing on the environment part. We have been very actively engaged in that work for a long time with the International Maritime Organization to ensure that ships moving into Arctic waters, their officers and staff on board, have the necessary equipment and structural capacity to withstand sailing in these waters, and a certain ability to manage themselves in case of difficulties.

Lord Soley: I understand your broad point— that you can ever increase without having full satisfaction— but I take it from your answer that you recognise that there is currently a lack of capacity. Is that right?

His Excellency Claus Grube: I did not say that there was a lack. In areas where you might be many thousands of kilometres away, there is no limit to what capacity you can use. That is why I say there will always be a limit to what you can put there. That is also why between the Arctic coastal states and between the Arctic states we have agreed on this close co-
operation and tried to pool and co-ordinate our resources in case of the need for rescue. If others such as the United Kingdom would like to participate with resources, I am sure they would be most welcome.

**Lord Soley:** That is my next question. We used to have long-range maritime aviation capacity, which we have lost in the last few years. Perhaps we should reconsider that. If we had something like that that we brought to the table and we looked at a co-ordinated approach involving the United Kingdom, would that be welcomed?

**His Excellency Claus Grube:** Yes, we would very much welcome such an approach. We would be very happy to look into that.

**Lord Soley:** That would include closer co-ordination with the UK, which has quite a long history in coastguard and maritime search and rescue operations.

**His Excellency Claus Grube:** Yes.

**Q291 Viscount Hanworth:** How does Denmark regard the increasing interests that are being shown in Greenland by the British, the Australians, the Chinese and others? Can you briefly describe what inspired this interest? Does it have implications for the Copenhagen-Greenland relationship?

**His Excellency Claus Grube:** We touched briefly on this issue earlier, my Lord Chairman. As a starting point, we would always see the economic development of the Arctic areas—in particular Greenland and the Faroe Islands, Denmark’s part of the Arctic area—as a natural economic, commercial development. Greenland and the Faroe Islands have self-rule and have taken over the use of their natural resources, but we will of course have to ensure that it is responsibly managed within the international obligations. We all have to do that. We are very happy that Greenland and the Faroe Islands are very much paying attention to that and that it is done in a sustainable way. That is only to be welcomed.
In my opinion, interest has been greater in the newspapers and the media than among commercial investors. I am only speculating, but I think some of the interest was generated by those who would like to become investors but who needed more investment to do so.

We would of course welcome that if it is sustainable and commercially viable. That is also why we found it positive that it was decided during the Canadian presidency to create the Arctic Economic Council, because stakeholders for economic development, such as private businesses and organisations, can meet there. It is not part of the Arctic Council as such—it is separate from it—but we can maybe use it as a forum to explain in more depth what the real possibilities and difficulties are in commercially working in the Arctic, which is very different from other environments that we know better. We can make sure it is done sustainably.

It also appears that many of the challenges and barriers for developing the economy in the Arctic are similar across the region. Whether you are in Arctic Alaska, Arctic Russia or Arctic Greenland, the challenges are basically the same. We therefore believe that the Arctic Economic Council will prove to be an excellent forum in which to address these issues. The work of that forum can hopefully serve as an inspiration to the broader business community interested in the Arctic, including the British business community.

**Viscount Hanworth:** How costly is Greenland to Denmark? I have the impression that it is significantly costly in subsidies and subventions.

**His Excellency Claus Grube:** We do not subsidise commercial investments.

**Viscount Hanworth:** But you do have considerable subventions for the Government, social services and so on.

**His Excellency Claus Grube:** My Lord Chairman, it is obvious that the maintenance of the modern welfare society in Greenland, and the Faroe Islands as well, is costly. Their standard
of living is to a large extent similar to the standard of living we have in Denmark. The level of social services is more or less the same. It is true that there was a heated debate on possible Chinese investment and possible investment by a company called London Mining—I do not know what that had to do with London—investing in mining activities in Greenland. The Greenlandic Government took the decisions necessary relating to labour law and regulation to ensure that it could be handled within their own regulations as far as labour law is concerned.

The Chairman: Ambassador, thank you very much. We will bring the session to an end there. I am grateful for your contribution and for going through the questions and answers today. Thank you very much indeed. I bring the public part of the meeting to an end and adjourn the Committee until 2 pm.
Dr. Ed Hawkins, Dr. Sheldon Bacon, and Professor Chris Rapley – Oral evidence (QQ 16 – 28)

Transcript to be found under Dr. Sheldon Bacon
Submission to be found under Dr Sheldon Bacon
Dr. Ed Hawkins, Professor Daniel Feltham, Dr. Sheldon Bacon and Professor Andrew Shepherd – Supplementary written evidence (ARC0049)

Dr. Ed Hawkins, Professor Daniel Feltham, Dr. Sheldon Bacon and Professor Andrew Shepherd – Supplementary written evidence (ARC0049)

Submission to be found under Dr Sheldon Bacon
The Henry Jackson Society – Written evidence (ARC0033)

About the Author

Dr Andrew Foxall is Director of the Russia Studies Centre at The Henry Jackson Society, a London-based security and international affairs think tank. Previously, he held academic positions at the University of Oxford and Queen’s University Belfast.

Dr Foxall’s research focuses on economic, political and security trends in Russia and the Former Soviet Union. He is the author of Ethnic Relations in Post-Soviet Russia (Routledge, forthcoming in October 2014) as well as numerous academic articles, book chapters, policy reports and opinion pieces. He regularly appears in international broadcast and print media, including the BBC, CNN, Foreign Policy, Financial Times and Sky News.

About The Henry Jackson Society

The Henry Jackson Society is a think tank and policy-shaping force that fights for the principles and alliances which keep societies free - working across borders and party lines to combat extremism, advance democracy and real human rights, and make a stand in an increasingly uncertain world.

The Russia Studies Centre is a research and advocacy unit operating within The Henry Jackson Society. It is dedicated to analysing contemporary political developments and promoting human rights and political liberty in the Russian Federation.

Evidence

1. Dr Foxall is the author of a number of pieces of work relating to international governance and security arrangements in the Arctic. The most relevant of these, “’We have proved it, the Arctic is ours’: resources, security and strategy in the Russian Arctic”, is a book chapter written in 2013, at a time when Russia had recently adopted a number of policy documents consequential to the Arctic region, including: the ‘Foundations of State Policy of the Russian Federation in the Arctic in the period up to 2020 and Beyond’ (adopted in September 2008, and made public in March 2009)\(^\text{46}\); the ‘National Security Strategy of the Russian Federation in the Arctic in the period up to 2020 and Beyond’ (adopted in September 2008, and made public in March 2009)\(^\text{47}\); and, the ‘Energy Strategy of Russia for the Period up to 2030’ (approved in August 2009)\(^\text{48}\).


2. At the time Dr Foxall wrote the book chapter, western academics and policymakers were unsure how to understand Russia’s increasing interest in the Arctic. On one hand, Russian politicians, including those in the Kremlin, were emphasising the importance of the Arctic to Russia in terms of economics, energy and security. This was often combined with a kind of belligerent nationalist narrative, somewhat reminiscent of Soviet propaganda. On the other hand, Russian politicians were emphasising the importance of international cooperation in the Arctic and the primacy of international law in sorting out territorial issues in the region.

3. Given events in Ukraine since the beginning of 2014, it is doubtful that those same academics and policymakers would now take seriously Russia’s commitment to international cooperation and international law. Just as with Ukraine, Russia argues that international law does not apply in the Arctic when its national interests are deemed at risk. While the fact that Russia outmanoeuvred the West in Ukraine does not automatically mean that Russia is an expansionist power, it is clear that Russia poses a threat to its neighbours in the Arctic. Russian politicians, including President Putin, have threatened to take their country’s current standoff with the West to the Arctic.

4. In the past, Russia’s Arctic policy was ill-defined. The early post-Cold War years saw a pronounced decrease in military tension in the Arctic and, at the same time, the widening and deepening of international and inter-regional cooperation, not least on environmental issues. Domestically, Russia’s policies toward the Arctic were rather imprecise, ranging from domestic migration regimes and the development of mineral resources to the establishment of a legal system for the Northern Sea Route. This, of course, was a result of the confusing and often chaotic nature of post-Soviet transition in the 1990s.

5. An early sign of Russia’s recognition of the importance of the Arctic came in 2001 when the Russian government endorsed an Arctic policy document and, later the same year, submitted an application to the United Nations Commission on the Limits of the Continental Shelf (UNCLCS) to extend its Exclusive Economic Zone in the Arctic beyond the standard 200-mile limit. Later, in 2004, the Russian State Council Working Group on National Security Interests in the North released a report calling for Russia to be much more pro-active in its Arctic policy.

6. In July and August 2007, Russia sent an expedition to the North Pole (officially called ‘Arktika-2007’) to collect data needed to substantiate its 2001 UNCLCS application. As part of the expedition, on 2 August, Russia planted its flag made from corrosion-resistant titanium on the seabed. This came just months after President Putin’s aggressive and revisionist speech at the 2007 Munich Security Conference, in which he accused the United States of having “overstepped its borders” and the West of “a hyper-inflated use of force”. Although many in the international community overreacted to Russia’s flag planting by suggesting that it was evidence of a ‘new Cold War’, it is clear that it was a sign of the increasing importance given to the Arctic within the Kremlin.

7. Since 2008, Russia has had a clear vision for the Arctic. In 2008, Russia adopted an ‘Arctic Policy’ (officially entitled ‘Foundations of State Policy of the Russian Federation in the Arctic in the period up to 2020 and Beyond’). The Policy aims to preserve Russia’s role as a ‘leading’ Arctic power. It identifies Russia’s four ‘national interests’ in the region as:
The utilisation of Russia’s Arctic zone as a national strategic resource base;

The preservation of the Arctic as a zone of peace and cooperation;

The protection of the unique ecological systems of the Arctic;

The use of the Northern Sea Route as a unified transportation link.

8. The Arctic Policy embodies the principles of political realism. It makes clear that Russia considers the Arctic to be central to its economic and social development and global competitiveness, and it outlines a number of military initiatives (both unilateral and multilateral) to support these. In sum, Russia seeks to protect its resources from potential competitors by using military might.

9. The Arctic Policy is divided into three main stages. The first stage (2008-2010) was designed to substantiate Russia’s Arctic extended continental shelf submission and establishing a framework for economic and infrastructural development of Russia’s northern regions. The second stage (2011-2015) is due to lead to international legal recognition of Russia’s external borders in the Arctic and an increase in Russia’s extraction and transportation of resources. Finally, the third stage (2016-2020) foresees the Arctic transformed into Russia’s leading strategic resource base.

10. Today, Russia is an openly revisionist power. Russia no longer believes that its interests are properly served within existing rules and laws, which it sees as unfair and having been forced on the country. Russia has clear and well-articulated geopolitical ambitions in the Arctic, and Russia wishes to rewrite the rules in the Arctic in three ways.

11. First, Russia is the only Arctic littoral state that is not a member of NATO. Russia sees NATO as a threat to its interests, and even its existence. Russia regards NATO as having meddled in the Arctic, just as it regards the alliance to have meddled in Europe, the Middle East and elsewhere. In addition, Russia sees the military capabilities of the other Arctic littoral states – not least, Canada and the US – as a threat to it, and Russia cites this as a reason for its own military build-up in the region.

12. Second, the Kremlin believes that the international borders agreed in the Arctic in the early 1990s were imposed on Russia by a devious West when Russia was weak. During the Cold War, the Soviet Union controlled approximately one-third of the Arctic Ocean as its territorial waters. Today, that figure is much lower. Russia perceives that it has lost valuable resources, not least oil and gas, because of its reduced territory, and that this is the fault of the West. As such, Russia is seeking maximum territorial claims in the Arctic. Russia’s 2001 submission to the UNCLCS seeks to expand its continental shelf continental shelf to include 1.2 million sq. km of Arctic seabed.

13. Third, access to the Arctic Ocean is becoming much easier as the average extent of summer sea ice declines, and Russia is keen to assert control over the Northern Sea Route – a route that would significantly decrease transportation costs and carbon dioxide emissions.
for a journey between Europe and East Asia. Russia has re-written its domestic legislation to define the NSR in such a way as to claim sovereignty over the route. Russia has also created an institutional framework to support this.

14. Developments in Russia over recent years suggest that it has the means to pursue its objectives.

15. First, Russia has invested in modernising its military on a scale not seen in the West in over a generation. While Russia’s 2008 invasion of Georgia was a military success, the operation revealed serious failures in the command and control of Russian forces. Russia learnt from this, and has made considerable new investments and dramatically improved its capabilities. Russia has increased the Northern Fleet’s forces, including commissioning a new icebreaker fleet and developing new nuclear attack submarines; modernised its forces in the three military districts that border the Arctic (Far Eastern, Leningrad and Siberian), including creating new Arctic brigades; begun constructing a missile early-warning radar in the Arctic; and re-opened Soviet-era military bases in the Arctic.

16. Second, Russia has played a game of ‘divide and rule’ in the Arctic in much the same fashion as it has in Europe with regards pipeline-delivered gas. Acting pragmatically, Russia has formed temporary alliances with other countries in the Arctic in order to further its own interests. It has aligned itself with Canada over the sovereignty of shipping routes and indigenous peoples’ rights; with Denmark/Greenland over climate issues and resource exploitation; with Norway over fishing; and with the United States over the applicability and relevance of existing international law. In this way, Russia’s furthering of its own interests has gone largely unnoticed.

17. Third, Russia challenged the established Euro-Atlantic security order when it annexed Crimea from Ukraine, and it has since forced allowances from the Ukraine to the effect that there is now another ‘frozen conflict’ in eastern Europe. Prominent Russian commentators, some of whom have connections to the Kremlin, have suggested that Russia sees current Western policy toward the Arctic as a threat to its interests, just as it saw Western policy toward Ukraine in the same way. While Russia peacefully resolved a territorial dispute in the Arctic in 2010 (the 40-year old maritime delimitation dispute with Norway over the Barents Sea), there is no guarantee that it will do so again in the future.

*September 2014*

49 The United States is the only Arctic littoral state that has not ratified the UNCLOS, although it does recognise UNCLOS as customary international law.

The Henry Jackson Society, the Arctic Advisory Group and the Royal Society – Oral evidence (QQ 158 – 172)

Transcript to be found under Arctic Advisory Group
On 7th October 2014, Dr Andrew Foxall, Director of the Russia Studies Centre at The Henry Jackson Society, gave oral evidence to the House of Lords Select Committee on the Arctic. The Henry Jackson Society is now writing to provide two pieces of supplementary evidence.

1. During the Committee’s oral evidence session, Baroness Symons of Vernham Dean requested that Dr Foxall confirm details of any flag-planting exercises in the Arctic in the years prior to August 2007, when the Russian flag was planted on the Arctic seabed as part of the ‘Arktika-2007’ ['Arctic-2007] expedition. As Dr Foxall said in his oral evidence, although the planting of the Russian flag is the most well-known flag-planting exercise, it was not the first.

In July 2005, the Canadian Defence Minister Bill Graham planted a Canadian flag on Hans Island, an uninhabited island between Ellesmere Island and Greenland and, at the time, the subject of a bitter and long-running dispute between Canada and Denmark over the Island’s sovereignty. The following month, in August 2005, Denmark retaliated by sending a warship to plant a Danish flag on Hans Island.

In the years since 2007, the flags of a number of states have been planted in the Arctic, including those of: Tibet, in April 2008; and, Kazakhstan in April 2012. In addition, the flag of Greenpeace, the non-government organisation, was planted on the Arctic seabed in April 2013.

2. Since the Committee’s oral evidence session, Dr Foxall has been asked to provide supplementary written evidence relating to his answer to Q167, in particular the Russian policy documents he referred to.

Lord Hannay of Chiswick had asked: “I wonder whether you could tell us what you think Russia’s intentions are towards the mineral resources, both onshore and offshore—and I am not talking just about oil and gas—in the Arctic…”

In his response, Dr Foxall noted: “Russia does a good enough job of telling us itself what it seeks to do in the Arctic. We could simply refer to a number of, if not several, Russian policy documents that stress the importance of the exploitation of resources—not simply hydrocarbons but also mineral resources—in terms of strengthening Russia’s position and its influence in international affairs and on the international stage.”

Examples of these policy documents include:

- ‘Foundations of State Policy of the Russian Federation in the Arctic in the period up to 2020 and Beyond’ ['Osnovy gosudarstvennoy politiki Rossii v Arktike na period do 2020 goda i dalneishuiu perspektivu], adopted in 2008;
The Henry Jackson Society – Supplementary written evidence (ARC0052)


The Henry Jackson Society hopes that this satisfactorily answers Baroness Symons of Vernham Dean’s and the Committee’s requests.

October 2014
Transcript to be found under HE Nicola Clase
HE Foo Chi Hsia and HE Keiichi Hayashi – Oral evidence (QQ 302 – 310)

Transcript to be found under HE Foo Chi Hsia
The International Association of Oil & Gas Producers (OGP) has reviewed the call for evidence and our comments specifically address the following questions:

- Question 2 on new economic and commercial opportunities, and how these might be delivered;
- Question 3 on balancing economic development with environmental protection; and
- Question 4 on ‘human aspects’ and economic opportunities for Arctic populations.

Formed in 1974, OGP encompasses most of the world’s leading publicly-traded, private and state-owned oil and gas companies, industry associations and major upstream service companies. OGP members produce more than half the world’s oil and about one third of its gas. OGP is a unique global forum in which members (currently numbering 83, with a combined workforce of more than a million employees) collaborate to identify and share best practices to achieve improvements in health, safety, the environment, security, social responsibility, engineering and operations performance.

With headquarters in London and with a significant presence in Brussels dedicated to EU affairs, OGP’s work is undertaken primarily by representatives of member organisations with support from a secretariat. The organisation is overseen by a Management Committee, elected every two years, made up of member organisation senior representatives. More information about the Association is available and can be found at www.ogp.org.uk.

OGP’s Arctic Committee is one of 13 standing committees within the Association. Its members include most operators with Arctic interests. The Committee’s remit is to consider the special opportunities and challenges for oil and gas operations in the region, with emphasis on four work streams: Arctic policy and regulatory advocacy; oil spill prevention and response; capabilities and standards for operating in ice; and cooperation with the Arctic Council. The Arctic Committee works closely with other OGP committees (e.g. Safety, Environment, Standards, Wells and EU Affairs, plus the industry’s socio-economic and environmental organisation, IPIECA) and participates on Arctic Council working groups such as Protection of the Arctic Marine Environment (PAME), Emergency Prevention, Preparedness and Response (EPPR), Conservation of Arctic Flora and Fauna (CAFF), as well as task forces mandated specifically by the Arctic Council Ministers such as the current Task Force on Arctic Marine Oil Pollution Prevention (TFOPP).

In addition to the Arctic Committee, OGP provides support to a joint industry programmes on Arctic Oil Spill Response Technology (see www.arcticresponsetechnology.org). The role of the programme former is to conduct international research to further enhance, and raise awareness of, industry knowledge and capabilities concerning oil spill response in the Arctic.

Submission from the International Association of Oil & Gas Producers (OGP) to the House of Lords Select Committee on the Arctic
September 2014

Response to Question 2: Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities and how might they be delivered?

Economic and commercial opportunities
1. Commercial activity and the use of natural resources in the Arctic has been taking place for some 500 years. In addition to oil and gas, commercial opportunities derive from shipping, fishing, tourism and mining. The annual economy of the Arctic is worth around $230 billion (£137 billion).

2. The oil and gas industry has almost 100 years’ experience of operating in the Arctic: Arctic exploration began with onshore exploration and production in Canada in 1920; Alaska’s North Slope on and offshore fields have been producing for over 30 years, while in the Norwegian Barents Sea, licence awards and subsequent exploration date back to 1980. Independent research has shown that since the 1960s, more than 10,000 wells have been drilled within the Arctic Circle. Today, the Arctic accounts for 25% of the world’s natural gas production and 10% of its oil production.

3. Further development of the Arctic’s abundant oil and gas resources has the potential to bring significant economic benefits at global, regional and local levels.51 According to the International Energy Agency’s (IEA’s) 2013 World Energy Outlook, the Arctic likely contains the world’s largest remaining area of conventional, undiscovered oil and natural gas, estimated at 13% of recoverable oil and 30% of recoverable natural gas resources. Developing these resources will contribute to meeting global energy needs, to alleviating poverty and to raising the living standards for millions of people.

4. By 2035, the world’s population is expected to grow to nearly 9 billion, while its energy needs will grow by one-third over 2011 levels. This considerable demand growth is even more striking given that in 2011, 1.3 billion people lacked access to electricity or modern energy sources and more than 2.6 billion people relied on traditional biomass energy like wood and dung for cooking. The share of fossil fuels in 2035 is expected.to fall from 82% to 76%, but given the increase in total global demand, natural gas is expected to grow by nearly 50% and oil supplies to rise 16% to 101 million barrels per day.

5. In Europe and the OECD overall, energy demand is expected to grow less rapidly, due to improvements in energy efficiency. Nevertheless, the European Commission and Council have concluded that oil and gas will still account for 55% of the EU energy mix by 2030. In terms of energy supply, IEA indicates that Europe will become more dependent on oil and gas imports by 2035. By then, EU net oil and gas imports will have increased from 60% to 80%. Energy security depends on diversity of supplies, which can be improved by expanding global sources of energy production and through investments in energy infrastructure in all regions globally, including the Arctic.

**Delivering economic and commercial opportunities: governance and collaboration**

6. The Arctic Council was created in 1996 as a forum for foreign ministers of Arctic nations to work constructively together on the region’s challenges and opportunities. The growing attention to and activity of the Council demonstrates that regional cooperation is strong. Arctic countries have made significant progress in settling boundary disputes and building institutions to foster cooperation over the last several years. Good examples include the signing of the Ilulissat Declaration in 2008, the settlement of the Svalbard Islands.

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51 Commercial opportunities for Arctic populations from oil and gas activity are outlined in response to question 4.
dispute in 2010 and agreements since 2011 on search-and-rescue, commercial fishing and joint oil spill response cooperation.

7. During almost a century of Arctic operations, the oil and gas industry has demonstrated how it can act as a catalyst for closer economic and political cooperation in the region. For example, industry has a strong track record of building successful, long-term partnerships with national oil corporations and governments of Arctic states, with host communities and with international organisations, businesses, academia, NGOs and others. Close collaboration among Arctic stakeholders is essential to further development of Arctic oil and gas resources. The Arctic Council acknowledges the central role of the private sector in this process and has established an Arctic Economic Council composed of industry representatives from each Arctic member nation.

Response to Question 3: How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained?

Environmental and safety performance in Arctic oil & gas operations

8. Oil and gas operations in the Arctic, as in other regions, are regulated by the governments of the countries in which the oil and gas resources are located. Over decades, Arctic governments have developed comprehensive, well-defined and effective national legislation that covers the range of industry activities. Complementing national legislation are the guidelines adopted by the Arctic Council as well as OGP members’ own well-established and rigorous standards of operational, safety and environmental performance.

9. In contrast to the misperception that the Arctic is universally uninhabited and undeveloped, the region is already highly diverse, with sizeable and growing population centres and significant commercial activity. It also has significant variations in landscapes, ecosystems, ice conditions, water depths and weather. Around four million people live in the Arctic, a population larger than 70 of the world’s countries. The Arctic port city of Murmansk, Russia, has a population of over 300,000, larger than Belfast, Strasbourg and Venice.

10. The oil and gas industry has a long history of drilling safely and successfully in the Arctic. It has pursued a ‘step-wise’ approach to operating in Arctic conditions. This has involved building capability and developing new technologies and standards of safety and environmental performance before accessing more challenging locations.

11. Ahead of every new Arctic project or activity, OGP members undertake extensive planning to ensure they understand and have the capability to manage operational, safety and environmental risks. As warranted, OGP members undertake scientific research and assessment, including social and environmental risk assessments, to understand how external factors could potentially impact operations, or how operations could potentially impact the surrounding environment and populations. Arctic conditions that must be fully understood include weather, daylight, remoteness, tides, water depths, ice, biological systems and ecosystem services important to local communities and indigenous peoples. Industry also consults with local, regional and national stakeholders to build a holistic understanding of the operating environment. This integrated knowledge is then included in
execution plans to ensure informed and robust risk management. Demonstrating how such knowledge is integrated within project planning and operations is essential to meeting regulatory requirements and obtaining permits from Arctic governments and to maintaining a licence to operate.

12. A number of examples from OGP members illustrate this approach. These include the construction of a production platform offshore Canada capable of withstanding impact from a 6-million tonne iceberg and developing and deploying state-of-the-art ice monitoring and management systems to safely operate in dynamic ice environments. Other examples include successful bottom-founded and floating exploration programmes in the Beaufort Sea in the 1980s, exploration from the Canadian Arctic islands from the 1970s and 1980s, exploration and production in the Russian Far East and the recently installed platform (Prirazlomnoye) in the Russian Pechora Sea.

13. Industry has also carried out extensive field monitoring a research programmes in support of its activities. In the vicinity of an oil and gas production project and pipeline system in Alaska, there has been extensive study and development of protection and impact management measures for Alaska’s Central Arctic caribou herd, which experienced a six-fold increase in population size from 5,000 in 1975 to more than 31,000 in 2002, and has nearly doubled again. Similarly, in the Russian Arctic, a population of western grey whales around an oil and gas production project has been scientifically monitored for the past 15 years to improve understanding of their key life events, including migratory patterns, and to manage operational sound levels to avoid harm to these animals. Over this period, there has been a 30 percent increase in the species’ population. In addition, in 2005, industry formed the Sound and Marine Life Joint Industry Programme aimed at safeguarding marine mammals from sounds associated with offshore oil and gas operations. To date, the programme has spent more than £20 million across 70 research contracts conducted by leading scientists from the UK, Norway, Denmark, U.S., Canada and Australia.

Oil spill prevention, preparedness and response (OSPP&R) systems

14. From the simplest task to the most complex project, the priority of OGP members is safe, reliable and responsible operations. OSPP&R are core components of the industry’s commitment to operating responsibly in the Arctic, as in all regions.

15. Spill prevention is integrated into all stages of project planning and operations. OGP members recognise that the way to make oil spills highly unlikely is through exhaustive risk identification and management, redundancy in design and operating controls, extensive operational planning and oversight, rigorous inspection and maintenance of equipment, and proper training, testing and drills.

16. In 2012, OGP members established an Arctic Oil Spill Response Technology Joint Industry Programme, a $20 million (≈£12 million) initiative to further improve response technologies through international research. Over a four-year period the programme is conducting research studies on dispersant use, environmental effects, trajectory modelling, remote sensing, mechanical recovery and in situ burning. As industry continues to improve OSPP&R strategies, it has committed to share research findings with governments, academia, communities and others.
17. In the unlikely event of an oil spill, a range of response options are available to limit environmental impacts. The past decade has seen significant advances in detecting, containing and cleaning up spills in Arctic conditions. Response activities include spill-monitoring, mechanical recovery of oil (e.g., using booms and skimmers) and the ‘in situ’ burning of oil (a technique that can rapidly eliminate up to 90% of spilled oil) with minimal negative impact. In addition, low-toxicity dispersants can be sprayed from boats or aircraft or injected subsea. These dispersants distribute oil in the water column, greatly enhancing the rate of natural degradation and reducing risks to birds and surface-dwelling mammals. Oil spill response (OSR) in the Arctic and elsewhere follows a standard, internationally-recognised three-tier process ranging from a low-impact spill in which local on-site resources are adequate, to a larger-volume spill caused by a non-routine event that requires substantial support from national or international OSR organisations.

18. In any territory, OSR is challenging and the first priority for OGP members is prevention. Arctic conditions (e.g., ice, cold temperatures, remoteness, darkness) can add to these challenges. However, OSR is entirely possible in the Arctic. In open water, OSR is performed in a similar manner as it is in warmer climates. If ice is present, ice formations can help contain spills and reduce wave activity compared to open water. Research demonstrates that dispersants can accelerate natural biodegradation of spilled oil just as efficiently as in warmer waters, given the presence of hydrocarbon-degrading micro-organisms that thrive on the vast volumes natural seepage of oil from the Arctic sea floor. Also, containment of oil by ice floes and the use of chemical ‘herding’ agents assist with in situ burning, while oil can be contained and recovered from melt pools or in ‘solid’ form if encapsulated in ice layers.

19. Industry works with Arctic communities to understand the location of important habitats and the timing of key life events such as migration, moulting or spawning periods. This information supports the development of plans to protect wildlife during normal operations and in the unlikely event of a spill. The most serious environmental impacts from spills tend to occur in shallow near-shore zones and on shorelines, as oil can become a long-term source of low levels of contamination to local wildlife. Response operations therefore often focus on rapidly implementing protection strategies to remove oil from water surfaces to protect sensitive surface-dwelling wildlife and reduce the risk of oil reaching near-shore areas and the shoreline.

Response to Question 4: What are the human aspects of the expected climatic and economic changes in terms of local populations, current and future?

20. The Arctic has been inhabited for thousands of years by indigenous peoples, who today number some 400,000 across 40 ethnic groups. Of these, two-thirds live in established settlements. Some lead traditional lifestyles; others a more contemporary way of life. OGP members have interacted with Arctic indigenous peoples since the early 20th century, when community representatives served as guides to help in discoveries such as the Norman Wells oil field in Canada’s Northwest Territories. OGP members are committed to operating responsibly and sustainably in the Arctic, working with local populations to develop resources in a manner compatible with traditional ways of life. The industry seeks to support communities where it operates to establish lasting relationships built on mutual trust and respect.
Consultation and engagement with Arctic communities

21. Engagement with local populations falls into four broad activities: consultation and knowledge-sharing, workforce development, business development and community investment.

22. As the traditional inhabitants of the Arctic, local populations provide OGP members with invaluable traditional knowledge. Through open consultation, OGP members seek to understand and incorporate the perspectives and expertise of indigenous peoples into project planning, design, execution and ongoing operations – all consistent with well-established international standards such as those of the International Labour Organization (ILO), the United Nations, and the World Bank Group.

23. The benefits of such consultation include awareness of how the timing or location of industry activities/works/facilities can accommodate biological activity such as whale migration and fish spawning periods, or traditional hunting practices. Early dialogue also allows plans to be developed to address potential socio-economic challenges or opportunities proactively that are the result of oil and gas activity. These can include the physical footprint of development, the presence of outside workers, revenue distribution and long-term employment, health, education and infrastructure issues. Dialogue on these matters is in addition to full adherence to national regulatory requirements and the involvement of other relevant stakeholders.

Economic opportunities for Arctic populations

24. The populations of the Arctic are direct beneficiaries of oil and gas activity in the region. Populations mostly welcome development and seek greater economic opportunity. OGP members invest heavily in creating economic and development opportunities for host communities that are consistent with the goals and objectives of those communities.

25. Examples of economic benefits include: recruitment from local communities and increasing the representation of indigenous community members among the workforce; the awarding of contracts and sub-contracts to local companies; the establishment of employee networks for those recruited from local and indigenous communities; and cultural awareness training for expatriate employees to ensure their sensitive interaction with Arctic communities and employees. OGP members also contribute to community development. They do this either through infrastructure improvements to support oil and gas activities from which communities also benefit (e.g., medical facilities, roads, bridges, ports, airports, power and water facilities) or directly, through charitable donations to local organisations (e.g., in education, health, youth development, the arts). Given the long-term presence of OGP members within Arctic communities, such investments can accumulate into many hundreds of millions of dollars over a project’s life-time.

26. In Norway the oil and gas industry purchased goods and services from businesses located in the Arctic worth 4.52 bn NOK (439mn GBP) in 2012. In addition, 1275 people were directly employed by the oil and gas companies, and the number increases to over 3000 when one includes the supplier industry. Both numbers have shown a steady increase year-on-year. Another concrete example of this is the Snøhvit gas facility in Hammerfest,
Norway, that contributes 150mn NOK (14.5mn GBP) annually in property taxes, enabling the city of about 10 000 people to invest in crucial infrastructure and services to the population. The addition of job opportunities and improvement in economy in the region has turned a population decline into a population increase over just a few years.

29 September 2014
International Association of Oil & Gas Producers – Oral evidence (QQ 189 – 202)

Evidence Session No. 14  Heard in Public  Questions 189 – 202

TUESDAY 21 OCTOBER 2014

Members present

Lord Teverson (Chairman)
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Moynihan
Lord Oxburgh
Baroness Neville-Jones
Lord Soley
Lord Tugendhat

Examination of Witnesses

Dr John Campbell, Technical Director, International Association of Oil and Gas Producers, and Dr Michael Engell-Jensen, Executive Director, International Association of Oil and Gas Producers

Q189 The Chairman: Good morning gentlemen and welcome to this evidence session of the Select Committee on the Arctic of the House of Lords. We are being broadcast and we are taking a transcription. We will send you a copy of that transcription, which you can check for errors.

You have some idea of the questions that we will be asking. There will also be a number of supplementaries. I do not expect you both to answer all the questions; I will let you decide who answers each one. If you both have something specific to contribute, please do. I think you have a copy of our interests in the area, so you know what those are.
To start, I invite you to introduce yourselves briefly and to say a couple of words about the OGP.

**Dr Michael Engell-Jensen:** Thank you, my Lord. My name is Michael Engell-Jensen and I am the Executive Director of the OGP—the International Association of Oil and Gas Producers. OGP has 83 members worldwide and our role is to engage with regulators and legislatures on behalf of our members and to do technical work. The focus of our work is on safety and environmental protection. We also do other types of work such as navigation and other mid-ocean work. We also issue guidelines. Over 40 years, we have issued more than 500 guidelines on recommended practices that are used by the industry to improve its working practices.

**Dr John Campbell:** Good morning. My name is John Campbell and I am OGP’s Technical Director. My specialisms within the association relate to environmental matters, which encompasses the Arctic. I am also responsible for a number of fairly substantial research and development projects, one of which relates to Arctic oil spill response technology, which is an adjunct to the work that we do on standards. There is also a major programme that has been running for about seven or eight years on the impact of sound on marine life; the Committee may wish to ask some questions on that issue.

**The Chairman:** Thank you. Lord Tugendhat will start us off.

**Q190  Lord Tugendhat:** By way of introduction, perhaps you could tell us how important you think the Arctic oil and gas resources are likely to be. Also, to what extent will their future development be dependent on global oil and gas prices, and what is happening in other energy markets in other production areas? Obviously, with a new territory of this sort what happens elsewhere will be very important, but perhaps you could seek to balance out those two considerations.
Dr Michael Engell-Jensen: According to the International Energy Agency, Arctic oil and gas are required to supply the oil that the world will demand. As such, they are therefore very important in the energy supply to meet the demand for oil and gas. We are talking about even 30 to 50 years ahead. Forecasts are forecasts, of course, but every trend shows that Arctic oil will be required, and we believe that is the case.

The Arctic is a very varied region. There has been Arctic production for 100 years onshore in the Northwest Territories of Canada. Offshore production started 50 years ago in North America. In fact, the Arctic already accounts for 10% of global oil production and 25% of gas production. There are very large gas fields in parts of the Arctic. To be clear, that is down to the Arctic Circle.

On the potential, estimates are, of course, very uncertain without drilling, but based on basin understanding, geological societies in the US estimate that about 25% of the oil that we will discover by exploration in future in the world will be discovered in the Arctic. That assumes that exploration goes ahead.

Whether the resources will be developed depends, of course, on the companies that operate and their investment decisions. It is clear that the oil prices have to meet the costs, which are uncertain, and opportunities elsewhere will, of course, be balanced against those in the Arctic. Therefore, were we to discover easy oil elsewhere, that might affect that development. The bottom line is that it is difficult to be categoric, but we as an industry firmly believe that the world will need those resources in the long term, and that is why you see industry working on that.

Lord Tugendhat: We have, of course, seen in the case of the Athabasca tar sands, for instance, a big reserve that nobody developed for a very long time because the costs were obviously going to be too great compared with what was available elsewhere. At the
moment, oil prices are falling quite sharply, and it looks as though that might continue for some while. Do you think that will delay developments in the Arctic?

**Dr Michael Engell-Jensen:** Our members’ thinking—I have to speak generically—is very much long term. Any oil company will make a long-term oil price assumption—our organisation is not engaged in that aspect—on which it will base its decisions. In many cases, a company will invest in exploration even if it does not know whether a discovery will ever come to fruition.

Oil companies are prepared to take large risks with regard to whether the exploration phase will lead to commercial development. There is uncertainty about prices, which determine what happens, but companies will take calculated risks, although various companies’ views may differ in that respect. Generally speaking, the theory is that future oil prices will be likely to sustain the cost, which is why the industry is looking seriously at developing the required capability step by step over the next 20 years.

**The Chairman:** Just to get this clear in my mind, will new production—rather than exploration—sites come online in the Arctic, either onshore or offshore, in the next five years?

**Dr Michael Engell-Jensen:** I am afraid I cannot answer the question, as I have no specific knowledge of our members’ detailed plans. I am not aware of any imminent offshore activities, although simply from an industry point of view I am sure there will be onshore activities that I do not know anything about. Onshore facilities are already well developed, so expansion takes place all the time.

**The Chairman:** Did you have a comment, Dr Campbell?

**Dr John Campbell:** No.
Lord Hannay of Chiswick: I want to be clear that I have understood you correctly, Dr Engell-Jensen. You are making a clear distinction between exploratory activity, which you think will continue pretty well irrespective of the gyrations of the oil price, and decisions to go ahead with production, which you believe to be much more sensitive to the oil price, particularly with regard to financing such activities. I think that is what you meant, but it would be helpful if you could confirm what was in your mind.

Dr Michael Engell-Jensen: The oil industry is prepared to take a much larger risk on the price during the exploration phase than it is for the capital-intensive investments in production facilities and drilling programmes.

Q191 Viscount Hanworth: An oil company’s stock-market valuation is based somewhat on the ratio of production to reserves. There seems therefore to be a strong incentive to discover reserves, even though they may not be viable for commercial exploitation. Can you comment on that? It would suggest that some things are not quite as they might seem on the surface.

Dr Michael Engell-Jensen: I am afraid that I cannot comment on that aspect, because it is purely commercial and financial, and is not within our remit.

Dr John Campbell: I, like my colleague, am covered by the same—

Viscount Hanworth: Restraint.

Dr John Campbell: Those are decisions that companies have to make.

Viscount Hanworth: I see.

The Chairman: An answer would have been interesting if we had had one, but never mind.

Q192 Lord Hunt of Chesterton: Does operating in the Arctic present different technical or logistic challenges? I am thinking not only about whether the operations are safe but about whether the environmental impact is minimised. In your previous answer, you referred to
risks. Do all the risks that are associated with operating in the Arctic affect the likely price of mining for oil and gas there?

Dr John Campbell: Let me stand aside from the price issue. I think our position on that is the same, no matter what. But we have to bear in mind that the industry has a long history of working in challenging environments. Twenty years ago, we would not have thought about floating and drilling ships or about LNG production. Technology has advanced, and the advance of technology has allowed us to tackle issues that would have appeared to be impossible 20 years, but which are now possible.

The industry has been involved in the Arctic for many years. We have drilled probably around 10,000 wells in the Arctic, onshore and offshore—probably about 1,000 offshore in that particular area. The top priority when industry is going into an area is the safe working environment for the people: protecting the people who live there and their environment as well. That is key. Right from the start, it is all about prevention and making sure that we understand the risks of the projects that we undertake, looking at how the risks can be mitigated and then building our management systems to make sure that, if we are moving through an exploration phase, we are full integrating the risks that we see and are addressing them appropriately.

It is a slow process, and industry has been working on this for many years, bringing together a lot of expertise from both within the industry and outside it. It is important to realise that 4 million people live in the Arctic—you have heard this on a number of occasions—and that when we go into an area, we need to speak to these people and understand their lifestyle and how the activities that may come to that area may affect that lifestyle. The people in the Arctic have unique knowledge about the systems there and we need to do this. It is the ethical thing to do and the right thing to do, which is why we do it.
Lord Hunt of Chesterton: One of the points about the Arctic is that it is changing very rapidly and, as we have heard, there are more dangers. There is a Canadian website that refers to the danger of tsunamis, because there is a lot of seismic activity that is currently dampened by ice, and when there is less ice there could be more of these kinds of events. Is all this factored in?

Dr John Campbell: It certainly is.

Lord Hunt of Chesterton: You say that people know the conditions, but the point is that they do not know the conditions, because the conditions are changing.

Dr John Campbell: Conditions in the Arctic change anyway, but they are changing in certain respects more rapidly at the moment. We have to be aware of these changes and try to factor them in. That means more care and more caution when we are projecting our plans.

Lord Hunt of Chesterton: There is one more thing. Is there good collaboration between the scientific and technical people in all the different countries, or are all the oil companies and oil explorers keeping their knowledge to themselves? Does your organisation, for example, ensure that there is good technical co-ordination and collaboration between the different teams, companies and so on?

Dr John Campbell: I would say yes. In fact, industry conducts a lot of research itself, which it needs to do to be able to understand the risks that it faces and how to mitigate those risks. The industry recognises that there are a lot of people in the academic and research fields who make life studies of these things and these topics. We commission research and take the views of those research studies into account—we may come on to topics such as our joint industry programmes. The key with those programmes is making all those results available. We are not taking the research results and keeping them to ourselves; we want to share them with the public and with interested stakeholders.
Dr Michael Engell-Jensen: I will just add that the Arctic is a new region for the oil industry, but we have dealt with the problems of new regions many times before of course. We have learnt that we learn new things as we go along, and the industry will invariably take what we call a stepwise approach. We will drill an exploration well somewhere and do a study on biodiversity in an area and so on. That will feed back in, and the plans that we have today for 10 years ahead will be modified as we go along. I noted with interest what you said about the ice and the tsunamis, and things like that are a good example. Where conditions are observed to be different as we explore step by step in the Arctic, it will affect plans, even perhaps to the point where you cannot do something that you intended to do.

The Chairman: I take your point about all the difficult things that the oil and gas industry does—we have seen all the good things that come from that as well as some of the disasters. Does the industry see the Arctic as a step change in terms of difficulty, because of its remoteness, the fact that it is in darkness for half the year, the much lower temperatures and things like ice? Is it different or is this just another bit of movement down a spectrum?

Dr John Campbell: The challenges in the Arctic are specific to the Arctic, there is no doubt about that. We have not worked anywhere else where we have had the issues of ice and we have certainly not operated anywhere or gone into new areas where there has been this question of remoteness. I say that, but we have been operating in the Arctic, or at high latitudes, for up to 100 years. There is experience of working—not only exploring but producing resources—in areas that are subject to seasonal ice, to remoteness from supply chains and to the other issues that you have mentioned.

Dr Michael Engell-Jensen: Sakhalin is not in the Arctic geographically, but it is like an Arctic area. We have operated in the Sakhalin area since the 1990s, drilling under ice and operating with ice in the sea.
Q193 Baroness Neville-Jones: Do you make a distinction in the level of risk and complexity involved between onshore and offshore? It is notable that there is much more onshore.

Dr Michael Engell-Jensen: It is generally much more challenging to operate offshore than onshore, anywhere in the world, including the British North Sea.

Baroness Neville-Jones: Specifically, why in the Arctic? Obviously ice is a factor.

Dr Michael Engell-Jensen: In addition to what we know from warmer climates, in the Arctic there is the extreme cold, the darkness and the remoteness, which add to the complexity compared with, say, the British North Sea, but that just means that the challenges are high, not that they are higher than anywhere else the industry has been before. We do not see the Arctic as an insurmountable region in terms of managing risk, but we take it very seriously, thus the step-wise approach and a 20-year expectation before we see significant offshore production.

Q194 Lord Oxburgh: If exploitation of hydrocarbon resources goes ahead in the area that we have been talking about, there will be a variety of different legal and regulatory regimes involved. Would you like to talk a little about the degree of harmony there is? Are they consistent with each other? How well defined are they? Could you talk about the regulatory regimes?

Dr John Campbell: Regulatory regimes vary from country to country. They are sovereign states and of course those sovereign states have the right to exploit the resources on the continental shelf within their boundaries. Regulatory regimes come in polar extremes. There are prescriptive regimes and more permissive regimes based on risk assessment. We respect the fact that countries will have laws and regulations, but that is just the start of it as far as the industry is concerned, because we want to operate within those parameters. We clearly do not want to step outside the law. We want to make sure that whatever we do is
consistent with the law but is also consistent with running a safe operation for the people in the industry and for the environment. Regimes that are based on goal setting, such as you have in the United Kingdom and have had for 25 years very successfully, allow us to develop and the technology and bring it forward. We identify the risks, we look at the risks, and we decide whether the risks are acceptable and how we can mitigate them if they are not.

We also have an opportunity through a number of higher forums to work with the international regulatory community. There are a number of bodies. The Arctic Council is clearly one, but there are others, such as the International Organization for Standardization and the International Maritime Organization, where issues relating to operations in the Arctic are discussed and we have an opportunity to interface with the various country representatives who are there to make submissions to enter into discussions. There are opportunities to engage. We would always prefer a performance-based approach, because it is consistent with what we do and we believe it is the way to ensure better operations, safer operations and accountability.

**Lord Oxburgh:** To some extent, the regulatory regime obviously refers to the safety of the operations, but there is also a question of environmental protection. Do you think that the environment in the Arctic and the ecosystems are sufficiently well understood that it is in fact possible to put a regulatory regime in place that you know is going to be effective?

**Dr John Campbell:** A great deal of information is known about the Arctic. Quite a bit of that information has been provided by oil and gas industry studies. It is impossible to say that we know everything. We do not. We know a great deal, and we draw on research studies from around the world to build up a picture. From that picture, we will be able to formulate our risk assessment. There will quite clearly be cases where we will have to step back and say that we need more information or to talk to a particular group of people to understand their
concerns, but we believe that operations are compatible with what some people call the fragility, but let us just say the ecosystem, of the Arctic. We believe that we can operate within that. We have operated within sensitive ecosystems in a number of other places around world, onshore and offshore, particularly in deep water, say off west Africa, where we do not know everything about the environment in the deep water area but we are doing research as we are going along, and we are also making checks and balances to ensure that what we are doing is not compromising the environment.

**Lord Oxburgh:** In what areas in particular would you like to see more work in the Arctic in understanding the environment of operations?

**Dr John Campbell:** It is a big subject. Understanding the ecosystem and how it functions is very important. Many regulatory regimes are built on the idea of an ecosystem-based approach to management. What is difficult is understanding the linkages in the ecosystem and how, if you move something one way, it affects something else because it is all checks and balances in the environment. It is a balanced system, and if we interfere with it too much, it does not have the resilience, but we believe resilience is there to accommodate our operation.

**The Chairman:** Dr Campbell, if there are areas where on reflection you would like to come back to us after this with a note of written evidence saying where you think some of those gaps are that could usefully be filled by you or other organisations, that would be very useful for us.

**Lord Hunt of Chesterton:** Data are extremely scarce in some areas, particularly in Russia. That needs to be addressed at international level.

**The Chairman:** If you want to come back to us, we would find that very useful.
Q195 Lord Hannay of Chiswick: Will you comment on some of the suggestions that have been made to the Committee in the course of our evidence gathering that shooting seismic is or could be damaging to wildlife in the Arctic region?

Dr John Campbell: This is an area on which we have done a substantial amount of research work. One has to look at a number of different levels. We have seen challenges ranging from the mortality of animals, of whales, as a result of seismic surveys through to physical damage to their hearing and to behavioural studies about stress. There is now a fairly strong consensus, not just within the industry but within the academic community and some of the regulatory communities, particularly in the United States, that seismic surveys as such are unlikely to cause death to marine mammals or to influence their hearing, and there are signs to back that up. The Bureau of Ocean Energy Management, Regulation and Enforcement went on record quite recently with that point. It is something that we look at very carefully, because the industry needs to use sound to be able to probe the subsurface layers to understand the geology. We need to work towards a way in which we can mitigate possible effects. There are a number of ways in which we can do this, such as having observers on board ships listening for the sounds of animals in close proximity to a survey and changing our operating conditions. That is part of the ongoing research. All the research work that we are funding is available. We do not believe that it is quite as critical an issue as some other constituencies do.

The Chairman: Can I get to the heart of this question again? I realise that we are getting a little short of time, but I want to understand this. The core of Lord Oxburgh’s question is: how variable is the regulatory regime? I do not think we really got an answer to that. Is some of it pretty lax and some of it really tight, or is it pretty well the same across the
board? Is there arbitrage through exploration because of that? I want a succinct answer because of the time, but I do not think you have given us a flavour of that yet.

**Dr Michael Engell-Jensen**: Regulatory regimes are different in the United States, in Norway, in—

**The Chairman**: I know they are different, but I am trying to get at how variable they are.

**Dr Michael Engell-Jensen**: I will answer the question this way. The safety and environmental standards that we apply are defined by the companies to meet or exceed any regulatory standard. For us, as operators it is not a question of whether the regulatory standards are more or less lax. We have our own approaches. We check that we meet or exceed the country standards where we operate. In other words, if one is more lax than the other, we will exceed all of them, including the most stringent regulatory regime where we operate. We do not really, as an industry, use the regulatory regime to take a minimum safety or environmental protection approach.

**Q196 Lord Moynihan**: Dr Engell-Jensen, in contrast to your comments, which I hope I have not taken out of context, that challenges are not higher than anywhere else and secondly that this is a new area of activity—which incidentally goes back to Prudhoe Bay in 1968, so there is a lot of experience since then—we have received a strong body of evidence that the challenges faced by an Arctic oil spill are far greater in ice-covered waters than in open water. How significant is the risk of a major oil spill in the Arctic and have we learnt lessons following disasters such as the “Exxon Valdez” and Deepwater Horizon? What measures are in place to prevent an oil spill in the Arctic? Perhaps Dr Campbell can comment in some detail on exactly what has been covered in this area in the context of his Arctic oil spill response technology industry programme which he mentioned at the outset that he is specifically working on. What lessons have been learnt widely about oil spill prevention in
the Arctic, and specifically what activity is going on at the moment in Dr Campbell’s sub-committee?

**Dr Michael Engell-Jensen:** On the first part of the question, the major shipping accidents were the “Valdez” and more recently the minor incident with the Kulluk, which was essentially, as far as we are concerned, a shipping incident. We learnt from them only about the human factors that are critical in any operation. Where we really learnt a lot about better oil spill response technology was the Deepwater Horizon incident in the Gulf of Mexico. That led industry, though BP, to create initiatives in all the relevant areas. There are four. The first is prevention, so in OGP we have today created a standing committee, with taskforces under it as you have, that works on prevention. First and foremost, the incentive must be to avoid an incident, a loss or a spill. We have to a much greater extent than previously accepted that the industry on its own account needs to prepare for a spill, should it happen nevertheless. For this, we have had a major industry initiative running for three years that has designed, constructed and deployed caps on the same principle as the one that was used to block the well in the Gulf of Mexico. There is one in Stavanger and there are others elsewhere. We have another joint industry party on oil spill response that is really focusing on the lesson learnt on in-situ burning and the use of dispersants. For most of us, an oil spill response is where we see the booms and the skimmers, but actually we believe in in-situ burning, where you herd and burn the oil that may have been spilled, and the use of dispersants to facilitate the action of bacteria. I was surprised—you may be too—that there are a lot of bacteria that feed on oil in the Arctic. They do so because there is a lot of natural secretion. If we were to have a major oil spill in the Arctic, we would advocate using dispersants to get the oil into small particles where the bacteria could naturally downgrade them, and before that, if there was a big accumulation, using in-situ burning.
The equipment is very much the same equipment that I have just described. We do not believe there is any fundamental difference.

Arctic temperatures vary but they are typically the same as at the bottom of the Gulf of Mexico, so we are used to those temperatures for the equipment. In the near future—the next 15 to 20 years—we think that the developments will be in shallow waters in the Arctic and we will not have these so-called high-pressure, high-temperature wells, which are the more challenging type. We think that the risk of well incidents is at the lower end of the acceptable industry risk. We have built facilities: for example, there is a platform offshore from Canada—Hibernia—which is constructed to withstand the force of a 6 million tonne iceberg drifting along. It is a very large structure for that reason, so there are examples of such initiatives already.

What is really important, on top of this, is the human factor, as I mentioned in relation to learning from shipping incidents. The training and development of the individuals who operate in the Arctic is very important, including for the specific conditions imposed by the remoteness, the darkness and the extreme cold. Generally, more and more is being focused on the human factor, which we realise is highly important and needs further attention.

Dr Campbell will say a bit more about the specific issues of ice and how we do experiments, but in broad terms we see combating a possible oil spill as very much the same challenge as the one that we have now learnt to deal with better following the Gulf of Mexico incident in 2010.

**The Chairman:** Dr Campbell, I am going to have to ask you to be succinct in your response.

**Dr John Campbell:** Of course. The Joint Industry Programme is a consortium of companies with $20 million in the kitty and a substantial in-kind contribution from many companies. The programme is not doing new research—it is building on work that has been done in
many other projects—but we feel that there is a constant need to upgrade our capabilities to be able to provide better assurance. We believe at the moment that we have the capabilities, but we want to improve them to reduce any margins that are there. My colleague has mentioned the basic techniques. They are straightforward and the same wherever you are, although the challenges of deployment might be slightly different: it is the mechanical methods such as boomers and skimmers, dispersants and in-situ burning. We are working with researchers across North America, Norway and France on this programme, which aims to upgrade our capabilities, perhaps come up with some new innovations and then make all that information available, because oil spill response is something on which companies feel no need to compete. This is a common enemy, and our research work will address that.

As for examples, there are great difficulties in making releases of oil at sea—you can understand that it is not exactly a very attractive prospect. It has been done, but there is some reluctance to do it. We model that by using large systems that we design on land. For example, we have just finished constructing a tank in Alaska that is about the size and depth of three Olympic swimming pools, in which we are going to do testing with oil and ice, looking at in-situ burning. We also look at techniques for keeping track of ice. There are facilities we can use in the United States with tanks where we can grow ice, place oil underneath and then use the latest remote sensing technology to follow the ice, so that if the ice were out of our sight for a while, we would be able to find it again. It is a fairly extensive programme; $20 million is not a lot of money to spend on research but it builds on the huge capacity of the industry to do its own research and on previous experience.
Q197 Lord Moynihan: Do you agree with Greenpeace, which gave evidence last week, when it says that, according to the US Geological Survey, “there is no comprehensive method for the clean-up of spilled oil in sea ice.”?

Dr John Campbell: I would not wholeheartedly agree.

Lord Moynihan: Would you agree in part?

Dr John Campbell: It is a challenge. Getting back every drop of oil from every oil spill has proved impossible. When you do the mass balances for any major oil spill, you have difficulty accounting for it all, but we believe that we have the technology to be able to tackle a spill in the Arctic.

Lord Tugendhat: You have given a very impressive answer from an industry point of view. I would not expect you to comment on different companies, but I would like to put the point to you that it is not just a question of the industry’s performance; one needs to look at the track record of different individual companies and to look not just at what happened with the Exxon Valdez and Deepwater Horizon but at Deepwater Horizon in the context of BP. When one looks at Deepwater Horizon in that context, it was the culmination of a number of accidents—there had been the Alaskan oil spill and the Texas City oil fire refinery before Deepwater Horizon. This seemed to reflect—perhaps I can put it this way—a culture within the company. One needs to look not just at the industry record and what the industry is doing but at the individual cultures of different companies and at those that appear to be more prone to accidents of one sort or another, not just in the Arctic or in deep water but across the board.

Dr John Campbell: You are correct that I will not comment on individual companies, but I will say that within a number of the regulatory forums, the idea of developing safety culture is becoming much more prevalent. There was a recent Arctic Council report on safety culture,
so it is being looked at. We will take from those reports, as well as contributing to them, which we have done as appropriate.

**The Chairman:** We need to move on. Lord Soley, some of this has been covered, but do you want to come in?

**Lord Soley:** As you say, most of what I was going to ask has been covered, but perhaps I could get something a little more specific from Dr Campbell. You have indicated that research is going on and set out some of the recovery methods, but I want to be clear about one thing. If you have broken or solid ice in an area, I am not sure how you use dispersants, or flaming for that matter. Bear in mind that Deepwater Horizon was a horrendous event and that the number of ships involved was massive, in the hundreds. You are looking at the Arctic, with that number of ships and with broken or solid ice. How confident do you feel about recovering from an oil spill in that situation?

**Dr John Campbell:** These are undoubtedly challenging factors that you mention. We have to look at the risk of these events happening—it is very small, but none the less they could happen. Oil in broken sea ice can sometimes be more easily recovered than oil in open water, simply because it has physical boundaries and we can get boomers, skimmers and mechanical recovery equipment in. Undersea ice becomes much more of a challenge, but that is one of the reasons why we are doing this sort of research. With undersea ice, we can, by remote sensing, know where it is, track it, and the moment it becomes accessible recover it. It is a challenge, as is getting the number of ships into an event such as Deepwater Horizon. But an event such as Deepwater Horizon is unlikely to happen in the Arctic, simply because we are not working in deep water and are not working at the moment on HTHP wells. These will be factors that we will have to consider if such plays become a reality in the future.
International Association of Oil & Gas Producers – Oral evidence (QQ 189 – 202)

Lord Soley: In what circumstances do you use dispersants? Is it when there is no ice?

Dr John Campbell: You can use dispersants in the presence of broken sea ice, because you are trying to break the oil up into droplets, which are then accessible to the bacteria in the water.

Q198 Baroness Neville-Jones: Can we turn for a moment to the Arctic Council? It has negotiated an agreement on co-operation on marine oil pollution, preparedness and response that has led to operational guidelines. We have had evidence to the effect that the agreement is not really very effective. What is your assessment of its effectiveness? What do you think the Arctic Council’s motive is in trying to get this kind of agreement going?

Dr John Campbell: The Arctic Council, as it is constituted, is a consultative body; it is where countries come together. But the agreements that it has recently started to produce, such as the one you refer to and the previous one on search and rescue, have been written so that they are legally binding. It can of course do that under the terms of the Convention on the Law of the Sea.

Baroness Neville-Jones: Are they are legally binding on the operating companies or as between the states?

Dr John Campbell: They are legally binding between the states. These are intergovernmental agreements. Of course, part of the process of intergovernmental agreements is the process of signature and ratification. The ratification programme is going through. It is recognition by the Arctic Council that the challenges it faces need to be addressed not just by talking together but perhaps by putting a little more pressure on each other to come together. The agreement on response is very important, because one of the challenges faced if there is a transboundary element, or if countries wish to assist other countries, is the ability to get goods, services and people to the point without them getting locked up in customs halls. The
agreement added a great deal in that respect. The council has now moved on to the oil spill prevention task force, which is aiming to deliver a similar level of agreement at that ministerial meeting in 2015.

**Baroness Neville-Jones:** How much effect do you think these agreements have in real life? Do you rate them as worth while and as something that will actually change the way both preparedness and prevention occur in the region?

**Dr John Campbell:** It is a positive sign that the countries have agreed to do this, worked together to do it and negotiated an agreement. One would hope that in the event that such an agreement was called into action, the countries concerned would live up to their obligations.

**Baroness Neville-Jones:** Has it not actually been tested yet?

**Dr John Campbell:** It has not been tested, and in many ways we hope it never will be.

**Q199 Lord Hunt of Chesterton:** You both referred to bacteria attacking oil spill. One rather curious feature, in my view, is that the oil industry has not defended itself vis-à-vis the Gulf of Mexico, where it is well known that the real reason for the dead area there is the insecticides and chemicals coming down the Mississippi. That is the view of the US State Department. The same problem will happen in the Arctic as the temperatures rise: we will have pollutants coming down the rivers from Russia and Canada into the ocean. I wonder whether, in your explanation in response to the question about dealing with oil versus these other major pollutants of oceans, you are not presenting a balance and the two sides of the case. In other words, the oil industry is taking it all on the chin but—I mentioned this in the House of Lords—there is serious damage in the oceans from these other kinds of pollutants, which may indeed have an effect on the bacteria attacking the oil.
Dr John Campbell: We would not get involved in debates on riverine discharge; we have our own battle to fight. There will undoubtedly be mobilisation of materials coming down rivers and into the ocean. There are many reports that look at the state of the oceans and the sources of marine pollution, which are largely due to land-based discharges and coastal development, not to the oil and gas business, for example.

On dispersants specifically, there is a view that dispersants can be grouped with those very nasty substances. I think you will find that in many of the regulatory regimes around the world where dispersants are part of the armoury against an oil spill, they are used on the basis that when they are added they do not add to the overall toxicity of oil, which is a natural substance that the ocean can metabolise.

The Chairman: Perhaps we can move on to another important subject.

Q200 Viscount Hanworth: Do local populations in the Arctic typically welcome oil and gas developments? How do such developments impact on local people? What measures do your members take to accommodate the interests, needs and wishes of indigenous people when pursuing their projects? Do you believe, for example, that Exxon Mobil, which has a population of 400,000, should necessarily defer to the population of, say, Greenland which numbers only 40,000? By the way, that question is generic, not specific to the enterprise that I named.

Dr Michael Engell-Jensen: It is not the oil companies that decide to explore; it is Governments in the region who decide to invite oil companies to apply for a licence. One would hope that those Governments have taken the view of their citizens into account, including the local people. Again, that is the minimum threshold for companies. Once Governments have granted the licence to explore initially, the industry invariably in today’s world will welcome working with the local community in different ways. The most direct
way is to offer employment and development. You will find that today industry typically creates valuable small infrastructure on the ground that can help local people in direct negotiation with the local community rather than as a large national programme. Of course, some local people may not welcome the industry, and if it is a matter of hunting seasons, migrations or breeding seasons, today the industry will try to negotiate a solution that can accommodate the exploration, if that is the case, and on the other hand the life of the indigenous people and their behaviour. Overall, the answer is that in general in the Arctic region our experience is that improving living standards and better prospects for future generations means that on balance the industry is more often welcome than not.

**Lord Tugendhat:** Can you give us some instances of major conflicts of interest between your companies and indigenous and local populations? Can you tell us how they may have been resolved?

**Dr John Campbell:** Again, this is getting into the realm of individual operators and individual populations. Certainly, there have been some issues to deal with in northern Alaska with the indigenous populations there, but that is really for the US Department of the Interior and the operators there rather than for the international trade association to respond to in detail.

**Q201  The Chairman:** We need to move on. I think we will come on to that issue in our next session a little more specifically.

The next question is on sanctions on Russian oil. Can you give me a one-paragraph answer on this, and if you would like to provide some more written evidence, we would appreciate that. Has the whole game changed in the Arctic with regard to exploration and the regime of US and EU sanctions on the Russian Federation?

**Dr Michael Engell-Jensen:** I can answer very briefly. We believe that sanctions are likely to delay the pace of development but not halt it. If the sanctions were to be long-lasting,
Russia might choose partners other than the western companies that they have hitherto signed up with. That might entail greater risks in development owing to the lower experience. It is generally very advisable to have very experienced companies operating, particularly offshore in the Arctic. We do not think that sanctions will halt Russian Arctic development, but we think it will delay it and we see a risk that it might be less opportune environmentally and safety-wise than otherwise.

**Lord Hannay of Chiswick:** Can we quickly look at the energy security of the UK, which is obviously a matter that this Committee is considering? In your view, what is the importance to the future energy security of the UK of Arctic oil and gas supplies? What degree of interest do the UK Government demonstrate towards these matters? Do the Government support UK energy companies in their work in the region? Could they do more? Perhaps you could also comment on whether, in terms of the UK’s energy security, one ought to be looking at two different parts of the Arctic, one part Norway, Greenland, Alaska and Canada, which you can consider to be about as secure a basis of supply for the UK as you can get, and Russia, which falls into a different category?

**The Chairman:** I am going to need to ask you to be succinct in answering those questions.

**Dr Michael Engell-Jensen:** In line with what I said previously, you may recall that we believe that the oil will be required by the world for this reason. Even if the UK manages to get a decarbonised power sector, there will be a need for gas and oil for heating and transport in the UK, so the UK will need to import more and more oil and gas over time. As such, the price becomes highly relevant to the UK. If there is a shortage, we will, everything else being the same, have higher prices. We believe that Arctic oil and gas is important for the UK. As you know, the North Sea supply is in decline. Today, a lot of the gas being consumed in the UK is from Norway. In fact, some of it is coming from the Arctic. It is a small amount, but
nevertheless it is coming from the Arctic. The UK has an Arctic policy framework that supports and facilitates responsible activity by UK companies, so there is a concrete element for the UK. We are aware of the very advanced Scott Polar Research Institute, which has mainly looked south to the Antarctic in the past, but that does not matter. I believe there are at least three world-class institutions: the Scott Polar Research Institute, the British Antarctic Survey and the National Oceanography Centre. In Aberdeen, the UK has a service industry that today generates more revenue overseas than in the UK. There is no reason why that service industry would not also be engaged in the Arctic in the future to a higher degree than it already is. There is a business interest and a security of supply interest for the UK, and the UK has a lot to bring scientifically.

**Q202 Lord Hannay of Chiswick:** As an association, have you seen any evidence of the activity of the British Government in carrying out the framework? As you correctly say, the framework says that the British Government will encourage these things. Are they actually doing it?

**Dr John Campbell:** The UK is an observer on the Arctic Council and so has taken a step of closer engagement. The rules of engagement for observers at the Arctic Council are unique to the Arctic Council, but none the less there is an opportunity there. Having taken that step, there is recognition that the Arctic is perhaps an important frontier for a number of reasons, including oil and gas.

**Lord Hannay of Chiswick:** That is not really the question I asked. It was whether you as an association have any evidence that your British members are getting any help from the Government in the work that they do.

**Dr John Campbell:** Not directly. That is not a question that we could answer. It is more a question that the national trade association might be better to answer.
The Chairman: Thank you very much. That brings to an end this part of our evidence session. I thank you both for taking us through those answers. We very much appreciate your presence here this morning. I remind members that we remain broadcasting while we do the change over to our next witnesses. You are obviously very welcome to stay.
1. During the oral evidence session of the House of Lords Select Committee on the Arctic, Lord Oxburgh asked "In what areas in particular [OGP] would like to see more work in the Arctic in understanding the environment of operations?" Subsequently Lord Hunt of Chesterton also noted that "data are extremely scarce in some areas, particularly in Russia". That needs to be addressed at international level." There was insufficient time to deliver a detailed response to these enquiries and the Chair proposed that OGP might submit some supplementary evidence for consideration by the Committee.

2. While it is fair to assert that we do not have a complete understanding of Arctic ecosystems (or for that matter other marine ecosystems) there is a substantial volume of scientific information in the peer-reviewed scientific literature. It is also noteworthy that groups within the Arctic Council, in particular the Arctic Monitoring and Assessment Programme have produced regular and detailed assessments for the Arctic (including Russia) that summarise (and cross reference) the current state of knowledge of the Arctic and its response to various facets of human development, including oil and gas exploration and development. These reports can be downloaded for example at www.amap.no. A challenge is that much of the specific research that has been conducted does not necessarily correspond with the areas that are of interest to the industry.

3. We accept that the industry does not know everything about the Arctic Ecosystems (there is no single descriptor of the Arctic, neither is it a homogenous environment) in which we operate. But OGP member companies have developed knowledge and capability to manage risks for the operations that we currently undertake (for example related to short-term exploration campaigns in open water and existing production in specific established areas). The industry capitalises on the experience gained from previous environmental studies and operations as part of the process of continual improvement. Some areas where we work to improve knowledge include area-specific understanding of the response of the local/regional ecosystems to different drivers or environmental pressures, be they natural (natural variability is typically large in Arctic environments) or anthropogenic (including shipping, fishing, military, oil and gas development, tourism, climate change or invasive species).

4. This continuously developing body of knowledge enables better ecosystem-based management that is founded on:

   - An emphasis on the health of the whole ecosystem ahead of the concerns of special interests;
   - Focus on a particular place with boundaries that are scientifically defined;
Developing long term time series measurements of physical, geochemical, biological and human factors
Accounting for the ways in which things or actions in that place are interconnected
How actions at a particular place can influence or be influenced by actions on land in the air or in the sea;
Integration of concerns of the environment, society, the economy and our institutions.

5. Research in areas where the industry operates on a longer term, if reserves are discovered and brought to production, will be underpinned by long-term monitoring and establishment of time series of physical, geochemical, biological and human factors that are essential to check whether risk assessments are sufficiently conservative. Such monitoring will involve traditional and new autonomous measurement technologies including for example, remote sensing and tagging capabilities, as well as technologies yet to be developed for specific challenges of sustained Arctic operations.

6. Environmental research should be seen in conjunction with refinement of operational practices that aim, continually, to further reduce the risk to the environment. Whilst industry ensures its operations in the Arctic are acceptably safe and robust to avoid incidents, industry will also continue its development of response technologies so that it can respond in an even timelier and effective manner to incidents, should they occur. Industry will not threaten arctic ecosystems by lack of understanding or technologies to address environmental risk. Developments in the Arctic will be predicated on our continuing focus on safety met through a capable, committed workforce and practices that ensure safe, secure and environmentally responsible operations.

November 2014
International Chamber of Shipping, Clarksons Research Services and Manson Oceanographic Consultancy – Oral evidence (QQ 63 – 80)

Transcript to be found under Clarksons Research Services
International Maritime Organization – Written evidence (ARC0066)

THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS (POLAR CODE)

INTRODUCTION

International Maritime Organization

The International Maritime Organization (IMO) is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships. It was established by a United Nations Conference in 1948 and, following the entry into force of the relevant IMO Convention in 1958, met for the first time in 1959. The purposes of the Organization, as summarized by Article 1(a) of the Convention, are "to provide machinery for cooperation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade; to encourage and facilitate the general adoption of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and prevention and control of marine pollution from ships". It is also empowered to deal with administrative and legal matters related to these purposes. IMO currently (December 2014) has 170 Member States and three Associate Members. The overall objectives are summed up in the IMO slogan: "Safe, secure and efficient shipping on clean oceans".

Ships operating in polar waters

Ships operating in the polar environments are exposed to a number of unique risks. Poor weather conditions and the relative lack of good charts, communication systems and other navigational aids pose challenges for mariners. The remoteness of the areas makes rescue or clean-up operations difficult and costly. Cold temperatures may reduce the effectiveness of numerous components of the ship, ranging from deck machinery and emergency equipment to sea suctions. When ice is present, it can impose additional loads on the hull, propulsion system and appendages.

Over the last 20 years or so, IMO has developed a raft of requirements, guidelines and recommendations regarding navigation in polar waters, relating to maritime safety (construction, search and rescue, navigation, life-saving, etc.) and marine pollution prevention (designation of special areas, carriage of heavy fuel oil, etc.) as well as certification and qualification of seafarers on ships operating in polar areas. All the work done over two decades culminated with the development of a mandatory International Code for Ships Operating in Polar Waters (Polar Code).

INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS (POLAR CODE)

The International Code for Ships Operating in Polar Waters (Polar Code) highlights the potential hazards of operating in polar regions, including ice, remoteness and rapidly changing and severe weather conditions, and provides goals and functional requirements in
relation to ship design, construction, equipment, operations, training, and search and rescue, relevant to ships operating in Arctic and Antarctic waters.

The Polar Code contains an introduction and two parts, which are mandatory, namely parts 1-A (Safety measures) and II-A (Pollution prevention measures). As well as mandatory provisions, recommendations are also included in parts 1-B (Additional guidance regarding the provisions of the introduction and part 1-A) and 11-B (Information and additional guidance to part II-A) of the Code.

**Polar Code: what it means for ships**

The Polar Code has been developed using a risk-based approach in determining scope and adopts a holistic approach to reduce identified risks. The main goal of the Polar Code is to provide for safe ship operation and the protection of the polar environment by addressing risks present in polar waters and not adequately mitigated by other IMO instruments.

Some of the main provisions are outlined below.

**Design and construction**

The Polar Code identifies three categories of ship which may operate in polar waters, as follows:

- **Category A ship** means a ship designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions.
- **Category B ship** means a ship not included in category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions.
- **Category C ship** means a ship designed to operate in open water or in ice conditions less severe than those included in categories A and B.

New ships of categories A and B ships must be designed and built to be able to withstand flooding resulting from hull penetration due to ice impact; while Category C ships need not be ice strengthened if, in the opinion of the national maritime Administration (i.e. the Government of the State whose flag the ship is entitled to fly), the ships' structure is adequate for its intended operation.

Ships intended to operate in low air temperature must be constructed with materials suitable for operation at the ships polar service temperature.

In ice strengthened ships, the structure of the ship must be able to resist both global and local structural loads anticipated under foreseen ice conditions.

Ships must have sufficient stability in intact condition when subject to ice accretion and the stability calculations must take into account an "icing allowance" of 30 kg of ice per square
metre on exposed weather decks and gangways and 7.5 kg of ice per square metre for projected lateral area of each side of the vessel above the water plane.

**Operations and manning**

All ships operating in Polar waters will be required to have on board a Polar Ship Certificate and the ship's Polar Water Operational Manual (PWOM), which is intended to provide the owner, operator, master and crew with sufficient information regarding the ship’s operational capabilities and limitations in polar waters, in order to support their decision-making process (including in normal operations and in emergency situations).

**Training**

While operating in polar waters, masters, chief mates and officers in charge of a navigational watch must have completed appropriate training, in accordance with the requirements of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW Convention) and STCW Code. Every crew member shall be made familiar with the procedures and equipment contained or referenced in the PWOM relevant to their assigned duties.

When operating in "open waters", the master, chief mate and officers in charge of a navigational watch must have completed basic training for master, chief mate and officers in charge of a navigational watch, when on tankers and passenger ships.

When operating in "other waters" (i.e. including ice), masters, chief mates must have completed advanced training for master and chief mate.

**Equipment**

Ships must carry specialist equipment suitable for low temperatures and dealing with ice, snow and long periods of darkness.

When operating in polar waters:

- ships need to be equipped to receive up-to-date information including ice information for safe navigation;
- ships intended to operate in low air temperature must be fitted with a suitable means to de-ice sufficient conning position windows to provide unimpaired forward and astern vision and the windows should be fitted with an efficient means of clearing melted ice, freezing rain, snow, mist and spray from outside and accumulated condensation from inside;
- adequate thermal protection is to be provided for all persons on board, taking into account the intended voyage, the anticipated weather conditions (cold and wind), and the potential for immersion in polar water;
• for passenger ships, a proper sized immersion suit or a thermal protective aid is to be provided for each person on board;

• ships operating in areas and during periods where ice accretion is likely to occur should be designed to minimize the accretion of ice and be equipped with means for removing ice, such as electrical and pneumatic devices, and/or special tools such as axes or wooden clubs for removing ice from bulwarks, rails and erections; and

• all components of fire safety systems and appliances are to be designed to ensure availability and effectiveness under polar service temperature and the design of fire safety systems and appliances need to take into consideration the need for persons to wear bulky and cumbersome cold weather gear.

Adoption of the safety measures of the Polar Code

The Maritime Safety Committee, at its ninety-fourth session (MSC 94), held at the IMO Headquarters from 17 to 21 November 2014, adopted the new chapter XIV (Safety measures for ships operating in polar waters) of the 1974 International Convention for the Safety of Life at Sea (SOLAS), as amended, which makes mandatory the adopted International Code for Ships Operating in Polar Waters (Polar Code) – introduction and part 1-A (Safety measures).

Expected adoption of the pollution prevention measures of the Polar Code

The Marine Environment Protection Committee, at its sixty-eighth session (MEPC 68), to be held at the IMO Headquarters in May 2015, is expected to adopt amendments to the Annexes of the International Convention for the Prevention of Pollution from Ships (MARPOL), which will make mandatory the introduction and part II-A (Pollution prevention measures) of the Code.

December 2014
WHAT DOES THE POLAR CODE MEAN FOR SHIP SAFETY?

EQUIPMENT

WINDOWS ON BRIDGE
- Means to clear heated ice, treacherous ice, slush spray and condensation

LIFEBOATS
- All lifeboats to be partially or totally enclosed type

CLOTHING I
- Adequate thermal protection for all persons on board

CLOTHING II
- On passenger ships, an accessible and well-arranged protective aid for each person on board

DESIGN & CONSTRUCTION

ICE REMOVAL
- Special equipment for ice removal, such as electrical and pneumatic devices, special tools such as saws or wooden chisels

FIRE SAFETY
- Fire-fighting equipment; means to protect persons from exposure to fire and extinguish or control fire

SHIP CATEGORIES
- Three categories of ships:
  - Category A: Ships operating in severe ice conditions
  - Category B: Ships operating in moderate ice conditions
  - Category C: Ships operating in light ice conditions

MATERIALS
- Suitable for operation in low air temperatures

INTACT STABILITY
- Required stability at ice condition to ensure safe navigation

STRUCTURE
- In ice-strengthened ships, the structure of the ship must be able to resist both global and local ice impacts

OPERATIONS & MANNING

NAVIGATION
- General information about ice conditions

CERTIFICATE & MANUAL
- Required to have in board a Polar Route Certificate and the ship's Polar Water Operational Manual

TRAINING
- Officers, crew, mates and others in charge of a navigational watch must have completed appropriate training for open-water operation and advanced training for other waters, including ice

BACKGROUND INFO

THE INTERNATIONAL CODE FOR SHIPS OPERATING IN POLAR WATERS WAS ADOPTED NOVEMBER 2015 BY THE IMO MARITIME SAFETY COMMITTEE.
- IT APPLIES TO SHIPS OPERATING IN ARCTIC AND ANTARCTIC WATERS
- THE AIM IS TO PROVIDE SAFETY GUIDELINES AND THE PROTECTION OF THE MARITIME ENVIRONMENT BY ADDRESSING RISKS PRESENT IN POLAR WATERS AND NOT ASSUMPTIVELY MITIGATED BY OTHER INSTRUMENTS.
1. The International Polar Foundation UK (IPF UK) is the British arm of the International Polar Foundation (IPF), a Brussels-based NGO, which seeks to inform the wider public about scientific research in the Polar Regions and its contribution to the understanding of key environmental and climate mechanisms. It also promotes innovative responses to the complex challenges raised by climate change, with a call to increased sustainability.

2. The IPF UK welcomes the opportunity to make a submission to the House of Lords Committee inquiry into recent and expected changes in the Arctic and their implications for the UK and its international relations.

3. The IPF UK would like to stress to the Committee the importance of engaging with the public and with schoolchildren to provide clear and accurate information about the Arctic environment, scientific research and the current and predicted impacts of climate change in the Arctic. The IPF UK provides interactive workshops and learning resources about these important topics which are used at schools, science centres and other venues (see www.educapoles.org).

4. The main source of information to the public on science and climate change is the media, and media reporting thrives on the new or controversial. Providing resources which communicate the most up to date peer reviewed research in a balanced, accessible and understandable way is likely to help to support and strengthen UK policies in the Arctic and on climate change.

5. Since 2010, the IPF has organised the Arctic Futures Symposium which takes place annually in Brussels. This conference encourages engagement between all Arctic stakeholders to try and reach the most sustainable outcomes for this important area of our planet. Reports, presentations and video interviews from previous Arctic Futures Conferences can be downloaded from www.arcticfutures.org/resources.

Note
This year’s Arctic Futures Symposium will take place from 14-15 October 2014 and we warmly invite all members of the House of Lords Committee on the Arctic to attend.

September 2014
Q214  **The Chairman:** Admiral Karsten, Dr Wood and Mr Johnson, can I welcome you to this evidence session of the House of Lords Arctic Select Committee? This is one of our many evidence sessions. This time we are looking at a bundle of issues such as hydrography information and data about the Arctic, and search and rescue. You should have a copy of all the interests that we have declared in the area, which is there for your information. We will be asking you a number of questions and supplementaries. You will have an idea of the sort of areas we will be covering. Clearly, I am not expecting everybody to answer all the questions, and some of them will be directed very much at an individual’s expertise. However, if any of you have something you think is valuable to the Committee that you want
to add, please do so. If one point or another is not covered sufficiently and you want to write in with further evidence, we would welcome that.

First, can I ask you briefly to introduce yourselves, going from left to right from where I am? Mr Johnson, perhaps you could start.

Rod Johnson: I am Rod Johnson. I am the former chief coastguard, and I was in post from 2008 to 2012. I am now in private practice, so the opinions I will be expressing are my own.

Rear Admiral Tom Karsten: I am Rear Admiral Tom Karsten, deputy chief executive at the UK Hydrographic Office and UK national hydrographer.

Dr Richard Wood: I am Dr Richard Wood, head of oceans cryosphere and dangerous climate change at the Met Office.

Q215 The Chairman: Thank you very much. Let us start off, primarily with Mr Johnson. I would like to ask you how extensive search and rescue coverage is in the Arctic maritime region. In which areas might that search and rescue capability be particularly lacking? Has the situation changed significantly since the signing of the Arctic Council agreement in 2011? The Committee visited Svalbard in particular and Tromsø during the summer. Because of the remoteness of the area and the difficulties, they had to mount an extremely complex rescue operation in Greenland at one point. We saw a few tourist ships up there with quite a number of people on them, so this seemed to us to be a particularly important area and one of potential danger for the future. We are very interested in that.

Rod Johnson: As you rightly point out, the issue with the Arctic regions is quite simply the tyranny of distance. Five states have a coastal presence in the Arctic region. All of them have forces that could be turned to search and rescue, but it is not like the UK, where there are standing search and rescue forces with clear response criteria. They are much more units
Roderick Johnson, Rear Admiral Tom Karsten RN and Dr Richard Wood – Oral evidence (QQ 214 – 225)

that have search and rescue as one of their many tasks, which include borders, fisheries and military purposes.

To give you a sense of the distance, it is over 2,000 miles from the most northern point of the UK, which is Out Stack north of Shetland, to the Pole. To get a sense of proportion, turning that distance round the other way would take you to Marrakesh, but between Out Stack and the Pole there is almost no infrastructure. It is that lack of infrastructure, or anything at all, that makes search and rescue response in the Arctic so challenging, because it is all about what you can take with you.

There are forces projected by the five littoral nations. The Arctic Council’s search and rescue agreement was ratified last year and has been tested twice. I have looked at the output report from the last exercise in 2013, which was SAREX Greenland Sea. It was very interesting. It has identified that any SAR operation up there would of necessity be an international effort. No one nation has enough resources to do the sort of operation you were contemplating for a large number of tourists. While the search and rescue organisation up there is not yet mature, it certainly has a progress path towards maturity, so it understands the need for interoperability agreements and the need to share information and its surveillance picture. The search and rescue effort there is on a path towards a point where some degree of assurance may be offered to touristic activities in the high north.

However, at the moment what could be mustered and what is required are two different things.

**The Chairman:** You are saying that at the moment it is very much behind the curve, to use a cliché, in the growth of activity there and the search and rescue capability.
Rod Johnson: The growth of activity is outstripping the available resources, and that is always the case. Commercial demand will always be much more responsive than any state’s ability to place resources there.

The people who operate there—I have had the great pleasure of working with them very closely—are extremely resourceful and determined by character. I would not want to portray it as a vacuum up there. They do know what they are doing, and the present population of the Arctic region, either remote indigenous people or science stations, is quite capable of providing effective search and rescue cover for that. SAREX Greenland Sea 2013 contemplated a scenario where they would have to deal with a large cruise ship. Cruise ships have been up there for a considerable period, fortunately without too many incidents, but the stretch would be a mass evacuation from a large cruise ship, because there is nowhere to take that number of people; it would be a huge logistic operation.

The Chairman: You said that two exercises had taken place. The Arctic Council does not have executive authority. How strong is that agreement? Has it really moved things forward? Is it delivering the promise that perhaps was expected of it at the time?

Rod Johnson: If you will excuse the awful pun, I think it has broken the ice. There are standing mechanisms by which nations co-operate for search and rescue. Around the world, depending on demand, they have matured to differing degrees. The harshness of the environment up there has traditionally forged a sense of shared peril and effort among the nations, but it was not structured in a particular way.

I noticed that the Arctic Council has declared the search and rescue regions expressly on the basis that it is not a precursor to any form of territorial claim, because within the Arctic Council many territorial claims are still unresolved. Therefore, they have separated out any
search and rescue from any territorial claim, which I think is a good thing. They now have an agenda that is essentially the lessons learned from its last two exercises, so the search and rescue organisation up there is on a path towards maturity in a way we have seen mirrored elsewhere in the world where demand has arisen. If we were to look at the end state, we could take the UK, the North Sea basin and the Irish Sea as an example of what happens when a search and rescue structure matures. We are a long way from that in the Arctic, but they are on that path.

**Q216 Lord Soley:** To what extent do you think search and rescue can be isolated from geopolitical tensions there?

**Rod Johnson:** I had the pleasure to serve with Her Majesty’s Coastguard for 26 years. There were occasions when some of the operations we were conducting had the potential to conflict with politics, but they never did. That is because essentially search and rescue is a humanitarian activity. My experience is that, no matter what the tensions might be, when life is in danger all other considerations are set aside.

**Lord Soley:** In answer to the Chairman, you said that Shetland was about 2,000 miles from the Pole, but if I remember rightly it is only about 400 or 500 miles from the Arctic Circle. Have you made any judgments about what the UK could do to enhance search and rescue operations, obviously not throughout the whole of the Arctic—it is a very large area—but within reach of Shetland and northern Scotland?

**Rod Johnson:** Since the loss of long-range fixed-wing maritime patrol aircraft from the UK inventory, there has been little we could offer to our colleagues in Iceland and Denmark in terms of reach. With even the longest range of a modern search and rescue helicopter, you are still short of the Arctic Circle.
On the other hand, the UK has trained officers from Finland, Iceland and Canada in search and rescue techniques going back over the past 15 years, so we have lent them our expertise and we continue to co-operate with them through a variety of fora.

**Lord Soley:** Should we get a long-range aircraft to replace the lost ones? Would they be useful?

**Rod Johnson:** Yes, I think we should. It is all very well to have a surveillance network that can see well over the horizon, but if you cannot reach out and intervene you are missing half the capability.

**Lord Hannay of Chiswick:** Are there any private-sector assets available in an emergency, or do they simply not exist?

**Rod Johnson:** Within the Arctic region most of the search and rescue forces are state-based. However, there is a duty upon every shipmaster to render assistance in the event of a distress being declared. Therefore, there may be private resources available on a contingent basis, depending on where the incident is and who is around.

**Lord Hannay of Chiswick:** I was also thinking of the private resources that are no doubt servicing the various oil and gas platforms and so on.

**Rod Johnson:** There are examples in the development of the North Sea. For example, BP provides Jigsaw, which is a private rescue service for its own platforms. There are aircraft and ships that service those platforms further north, and they would be available. The gap in capability might arise in the provision of winch-fitted helicopters, or surface units with the right kind of endurance.
The Chairman: It has been suggested that cruise ships should operate in pairs in case there is a problem with one. We would hopefully not have a problem with both. Is that credible, or is it rather pie in the sky?

Rod Johnson: I think it is a very sensible way forward. A large modern cruise ship could contain anywhere between 2,000 and 4,000 people. The really large ships tend not to go that far north because their trading patterns are somewhere else, but that is still an awful lot of people and they have to go somewhere. There is no infrastructure in the Arctic region, you cannot land them on an ice floe and they have to be put somewhere, so the nearest refuge could be the ship next door. Although it would be quite cramped and crowded, at least it would be relatively safe. The only issue with mutual support is that the life-saving appliances fitted to a passenger ship are designed to get people off, not to get people back on. I am aware of some excellent work being done by the International Marine Rescue Federation on this very problem. The use of modern slab-sided merchant ships as rescue assets means that getting off is much easier than getting back on again.

The Chairman: That is a very good point.

Q217 Viscount Hanworth: This question is for Admiral Karsten. How well mapped is the Arctic Ocean? Is our hydrographic knowledge of the region good enough in view of the natural hazards? Should we accord a higher priority to the region than we do at present? I imagine that submariners gathered extensive hydrographic information during the Cold War as an adjunct to the hostilities and that knowledge would now be generally available, but I am uncertain about this. Could you comment on that as well?
Rear Admiral Tom Karsten: I do not know whether the chart I provided would be of any use at this point. [Readers are referred to the written evidence from the UK Hydrographic Office available on the ‘Publications’ page of the Committee’s website.]

The Chairman: Indeed.

Rear Admiral Tom Karsten: It is not a complete picture, but it may help to orient us with respect to the standard of charting in the region, which, in a short answer, is fairly ‘curate’s egg’. Some parts are adequate, others are not. If we look at the chart briefly, the red squares reflect UK Hydrographic Office or GB charts. As you see, they cover, at fairly small scale, a portion of the Arctic but not the whole region. Instead, we have a reliance on coastal charts produced by coastal nations, which, with respect to the Arctic, refer primarily to Russian charts of the Northern Sea Route, Canadian charts for the North West Passage; and some Danish charts around Greenland. They are of variable quality for a number of different reasons.

The Northern Sea Route charts are fairly comprehensive in terms of numbers, both on paper and electronically, but the surveys on which they rely are relatively old. Having said that, surveys around the world can be relatively old, except for the most demanding and high-density areas. The question of horizontal positioning, without becoming too technical, can on occasion be slightly tricky. As to paper charts, they are also in Russian and therefore are of most use to local rather than international traffic. I would argue that the northern sea route in coastal terms is relatively well charted.

The North West Passage is a different question. I am sure our Canadian colleagues would be the first to admit that this is a challenging area in hydrographic terms. The coastal area around Greenland is similarly fairly patchy from the Danish perspective. Therefore, the short
answer as to the standard of charting is that it is variable across the piece, but that in a way reflects some of the challenges that exist throughout the world.

Your second question was in respect of hydrographic standards in the region. There are technical measurements to how well areas are surveyed. They range from spot-on accuracy to a few metres, to accuracy that both in horizontal and vertical terms is questionable. You could have areas where depth anomalies of some size may exist, and horizontal inaccuracy, for instance the point of a rock being as much as 500 metres or half a mile out of position. Therefore, the technical standards of hydrography in the region are a little questionable, but again that can be the same throughout the world.

Your third question was with respect to priority. From a UK perspective, we aim to chart the world and service the needs of the international mariner. We spend a significant amount of time analysing the densities and movements of shipping around the globe to ensure that the services that we provide the international mariner are up to date. Even with the reduction in ice over the past few years, we believe that, at the moment, there is insufficient priority to focus much more effort on the Arctic region. To put it another way, there are areas of the world where we have to devote more effort, West Africa being a good example and the South West Pacific being another, and the density of shipping is such that we have to focus such resources as we have on updating those charts first. The time may well come when the amount of traffic in the Arctic, in particular international traffic, increases. At that point we will rapidly readdress that issue and seek to increase what we can offer. For the time being, for transiting traffic on the Northern Sea Route the reliance will be on Russian-produced paper and electronic charts, which I believe are broadly adequate for the purpose, but, as ice
recedes, further survey will be necessary because there are large swathes of the Arctic where survey standards are woefully inadequate.

**Viscount Hanworth:** Referring to our own charts, where would you say the greatest accuracy and inaccuracy is within the regions bounded by red lines on your map?

**Rear Admiral Tom Karsten:** Those charts have been schemed and selected to reflect the needs of the Royal Navy as well as our commercial needs, so they cover two aspects. They are aimed to provide planning support for commercial access to ports along the Norwegian coast and in Russia, so they cover both Murmansk and Archangel, which for us are commercially important ports. You will see the line that follows the Norwegian coast where the availability of better scale charts is much greater. If you were transiting, therefore, from Europe through to Murmansk or Archangel, the standard of charting would be relatively high. For other areas shown on the chart, for instance east Greenland, that would not be the case.

**Viscount Hanworth:** On a rather different tack—this may also be within your ambit—I am aware that long-term forecasting of the Arctic climate depends crucially on our understanding of the thermohaline circulation both as regards its trends and its variability. A decade ago there were perverse speculations concerning the weakening of the Gulf Stream, which I imagine would make us very cold, but I believe these ideas have been dispelled. Is the current state of our knowledge really sufficient for the purpose of forecasting?

**The Chairman:** I am sure Dr Wood would like to answer that maybe a little later.

**Viscount Hanworth:** We have also received something today about the jet stream rather than the Gulf Stream, so maybe you might wrap all that up.
Q218 The Chairman: I think we will come to that later on. Stephen Harper, the Prime Minister of Canada, has said—I was going to say “threatened”, but that is the wrong word—that for territorial claims it will measure every bit of the sea bed of the Arctic. I think Russia is doing a similar thing for its own claims. Will that provide the same information that you are trying to get here, or is that a completely different set of things? Will some of this be solved by the fact that the territorial disputes drive the need for data?

Rear Admiral Tom Karsten: Yes, it will. The fact that the Russians and Canadians are keen to ensure that they understand that the nature of their coastal waters is of direct relevance to the standard of hydrographic product that could be available, so it is to be welcomed.

Lord Soley: Is there anything that we are not doing that you think we should be doing?

Rear Admiral Tom Karsten: From a UK perspective, the UKHO has a responsibility for charting the world and meeting the needs of the international mariner. We do that with a series of charts of a uniform nature derived from the best products that we could acquire. The level of engagement that we currently enjoy with our colleagues in the Russian hydrographic service always needs working at. To answer your question as to whether there is more that we can do, I think we can increase engagement, if possible, with our Russian colleagues to ensure that we are gaining access to the latest information that they have and therefore producing a series of charts that at one point might cover the whole of the Northern Sea Route.

Q219 Baroness Browning: Is the capacity for weather and ice forecasting in the Arctic currently good enough to ensure safety for shipping and maritime activities? Could we hear a bit more about exactly where you think further improvement should be made? I am looking to Dr Wood to answer that. On the back of that, in relation to what we have heard
about cruise ships that already go into these waters, to whom exactly do they apply to get a
risk analysis and information that makes them think that commercially it is safe enough to go
ahead? Which body would they go to for that green light to proceed? I turn to Dr Wood first
on the question of forecasting.

**Dr Richard Wood:** I should preface my reply with some context here. For response to
emergencies in particular, it is important that there is a single authoritative source of
information on weather and environmental conditions. The lead bodies for that are
designated by the International Maritime Organization and the World Meteorological
Organization, and for the Arctic those are based in the Arctic states. The UK’s contribution to
this through the Met Office comes primarily through our global weather prediction
capability, which is then an input to the more detailed forecasts produced by these regional
centres. The Met Office forecast is widely shared among the international weather
forecasting centres. Indeed, it is generally seen as one of the leading global forecast
products, so that information goes into that decision-making.

We have the capability to rapidly develop a relocatable regional modelling capability for
particular crisis regions. I am not aware of that having been done for the Arctic specifically,
but it has been done in the past for a number of natural disaster regions or operations of the
UK military, so that capability is there.

To answer the question about the ability to forecast in the Arctic, it is a particularly
challenging region for a number of reasons to do with both observations and modelling. We
are very reliant in the Arctic on satellite observations, because clearly the surface network is
not there. Interpreting that satellite data can be more difficult in the Arctic than in some
other regions. To give you an example, the satellites that measure sea surface temperature
essentially measure something to do with the radiation coming off the surface of the ocean. They then interpret and process that to give information about surface temperature. The algorithms and methods that we use to do that are very much focused on ice-free regions, particularly near the ice edge where you have a mixture of water and ice. The algorithms to process that satellite data are quite complex and need a certain amount of ground-truthing from in situ observations to help us improve them.

Baroness Browning: Is that ground information forthcoming?

Dr Richard Wood: It is. It is a slow process through internationally co-ordinated research programmes, because clearly the observational programmes need international co-ordination to make sure that they are in the right places. This is an area where there is good international collaboration. The Met Office hosted a workshop on this back in December last year to bring together the experts in these areas. There are programmes that tend to evolve on the time scale on which research programmes evolve, so they take multiple years to spin up. They also have to be synchronised with the release of new satellites. When a new satellite goes up there will be a concerted effort to put observations in place on the ground to do the ground-truthing. This work goes on, but it remains challenging because we do not have the routine observations coming in every day from the ground network to give a different perspective on the satellites.

Baroness Browning: This sounds like quite a long process.

Dr Richard Wood: It certainly is. It tends to be synchronised with the new satellite instruments as they go up. The algorithms are developed by a bunch of scientists in different groups. In the UK we produce a particular analysis of the surface temperature and sea ice. That is produced daily and fed into weather forecast centres around the world; it is widely
disseminated, but compared with the other groups around the world, this is one of the regions where there is still some uncertainty going from the observations that come in to our globally complete fields of sea ice and sea surface temperature. You have to fill in the gaps, and there are choices about how you fill in the gaps and process the satellite data. We see considerable uncertainty. When you do that in different ways, you get slightly different answers.

Baroness Browning: CruisesRus decides today that next season it is going to produce a lavish brochure and take people into these waters. Whom does it consult to do that risk analysis on the basis of the forecast at that time?

Rod Johnson: Before the ship can go up there, there are a number of hurdles to be passed. First, in no particular order of significance, the ship has to be at the very least ice-strengthened to work in ice. The individual company will do a risk assessment to decide whether or not the ship can go up there and the competence of the crew who are taking her up. At the moment that is slightly informal and relies upon the experience of the particular operator, but the International Maritime Organization is on the cusp of launching the Polar Code. That would require a much more explicit safety regime for ships and crews to operate in that area.

Baroness Browning: To which body do they go for weather and ice forecasts?

Rod Johnson: They would go to a number of sources. They may be seeking that commercially, they may go to the forecasting authorities in the area they are operating in, they may go to the Met Office. It is a commercial decision; it is something that they would pay for.
Lord Hunt of Chesterton: We have had evidence before—we looked at your map—that all round the coast of Russia are large areas that are quite shallow. The nature of this area of the world is changing. There are huge currents coming down the rivers. We know that the English Channel changes considerably from year to year, and the methods you use to calculate that use satellites, waves and so on. With climate change changing these huge currents and rivers, is this not an area that is slightly risky? You are going quite close to the coast in these shallower waters. Is this part of the research, investigation and new technology that is coming in?

Rear Admiral Tom Karsten: Yes. It is a very dynamic area and it needs to be updated as often as possible to ensure nothing has been missed. My understanding is that the limitation is about 12 metres through the Kara Sea, so we are talking about relatively shallow navigational routes. There are new methods for establishing hydrographic bathymetry data whereby you can use satellite-derived bathymetry, but that requires relatively clear water to take a photograph from which you can then discern some sort of depth.

Lord Hunt of Chesterton: There is also a method of using dirty water and looking at surface waves. I saw this at the Taunton lab when I was head of the Met Office.

Rear Admiral Tom Karsten: It probably does not have sufficient accuracy to take large vessels through relatively shallow water, so it is only indicative. I think that would be a relatively inaccurate form of data collection.

Viscount Hanworth: You mentioned surface temperature measurements from satellites, but do you also transduce information from buoys or ships as well, and to what extent is that useful?
Dr Richard Wood: It certainly is. There are research data from land stations around the edge, which are clearly important. There are relatively few data from the ocean surface. Clearly, there is not a lot there, but things like ice-tethered platforms will produce some basic met data. Given the sparsity of data, every bit you can get is helpful, so those things are useful.

Viscount Hanworth: That comes from different nations.

Dr Richard Wood: That comes from different nations, but it can generally be shared.

Q220 Lord Addington: We are wondering how the Arctic environment affects safety awareness and activities, such as search and rescue, in other ways. For instance, how is the effectiveness of GPS and high-frequency radio that far north affected? Would it be a good idea to increase bandwidth in the Arctic to connect better with the satellite system? The question is about electronic communications generally and what happens, and how that is changed by the Arctic environment.

Rod Johnson: Starting with GPS, that suffers in higher latitudes. Essentially, it is a system where the receiver looks at satellites passing overhead and uses time difference to form position lines that intersect. If the intersection of those lines is not obtuse because the satellites being seen are unfavourably aligned, the position is harder to interpret. Satellite geometry in higher latitudes is often unfavourable. The system is prone to disturbance through the effects of the ionosphere and the sun. Those corrections can be broadcast through the wider area by geostationary satellites, but they are above the equator so the ability to get wide area corrections is also slightly diminished. Therefore, the faith one can place in GPS is reduced, but a prudent navigator will be using more than one means of navigation anyway.
Satellite communication is probably the most reliable means of communicating up there because, as evidenced by the aurora borealis, the reflecting layer that normally works for radio waves, the ionosphere, is prone to disturbance by solar weather, more so in the polar regions than anywhere else.

With regard to bandwidth or additional means, I am not aware of any particular congestion, but I have not operated up there for a continuous period of time. I do not know whether any other members of the panel can shed some light on that.

*Rear Admiral Tom Karsten*: I operated in the Antarctic as captain of HMS “Endurance” for a couple of years and therefore two seasons. While the circumstances in the Antarctic are very different, the geography, in the sense of where it is, is similar, and clearly there are challenges in operating at higher latitudes with your ability to hit a satellite and get the information you need and communicate in the way you would wish. Therefore, there are challenges in relation to using that sort of facility.

*Lord Hannay of Chiswick*: Will the existence of Galileo, when it comes into operation, make any difference, or is it open to exactly the same problems as GPS?

*Rod Johnson*: It is similar in concept. Therefore, it will be prone to the same sort of limitations that the Chinese, Russian and American systems have, although Galileo has a slightly enhanced capability for the promulgation of what we call wide area correction: in other words, its ability to correct.

Polar navigation is not for the inexperienced; it is an art form. It is not a mainstream activity. One of the requirements of the Polar Code will be on the competence of the individuals who operate there, because ultimately the navigation systems are what they are; it is the person operating them and their understanding of the particular challenges who is most important.
Lord Hannay of Chiswick: To switch to a completely different subject—the possible impact of a significant oil spill in the Arctic—could Mr Johnson say what technologies and methods exist for responding to an oil spill in either ice-covered or ice-present sea? Have these methods been proved to be effective? Have there ever been instances where they have been shown to work, as opposed to just working in theory?

Rod Johnson: Cleaning oil out of the sea is a very difficult process, even on a nice day in a warm ocean. Oil is a particularly intractable substance. To give you some idea of the percentages, mechanical recovery—scrubbers and skimmers—might get you 5% of the loss, evaporation would be another few per cent, bioremediation takes care of a significant proportion of the oil—that is, wave action breaks up the substance—and some of it simply disappears. We do not know where it has gone. Twenty-five per cent of the loss from Deepwater Horizon is unaccounted for; we just do not know where it went—it is gone—so it will be lying somewhere waiting to be discovered.

Skimming is not possible in ice-covered water because there is literally ice in the way. The oil would go under the ice. In addition, oil is very temperature sensitive. To pump around a cargo of crude oil or oil fuel it needs to be the temperature of a very hot cup of tea to make it flow. Therefore, as soon as you introduce it into cold water under ice it become very viscous and difficult to deal with. I have seen incidents of small losses of lighter fractions of oil as a result of grounding in the North West Passage and conventional booming technology—in other words, putting an inflatable boom around the ship—has contained the spill. However, we have not seen an incident involving a large-scale loss of a viscous fraction where ice is present, so at the moment that is indeterminate. I certainly would not want to try it.

Lord Hannay of Chiswick: But you would not necessarily have the option.
Rod Johnson, Rear Admiral Tom Karsten RN and Dr Richard Wood – Oral evidence (QQ 214 – 225)

*Rod Johnson:* No; that is quite true. I have discussed at length with colleagues from other nations spills in the Arctic, and I have given presentations on it. When I consulted my colleagues and asked, “What advice would you have me give to the august audiences I am talking to?”, they said, “Do not have a spill”. That was their advice.

*The Chairman:* Is that a PowerPoint presentation you have given before?

*Rod Johnson:* Yes, it is.

*The Chairman:* I think we would be quite interested to see that. It may be your commercial property.

*Rod Johnson:* Not at all. I will send it across to you.

**Q222 Lord Hunt of Chesterton:** My next question is about how you are working with other organisations. We have talked about the Met Office, Hydrographic Office and HM Coastguard. There are other organisations in the UK, are there not, such as the maritime organisation BMT, which are also interested in satellites? There is also the question of collecting and sharing data with all these different organisations, because the Met Office can do its forecasting only when it is sharing data—this has been referred to before—and shipping produces that. Some of the exploration platforms do not necessarily share data. Is that being taken seriously enough in light of the risks in working in these areas?

*Dr Richard Wood:* The basic met data have a long history of being well shared around the world from the global meteorological observing network. As you rightly point out, there are observations outside that network. While I cannot comment specifically on cases in the Arctic, I am very aware of cases in the marine environment around the UK where, working with other partners, often in the private sector, it is possible to gain access to those data to
feed into forecasts. It tends to be done on a more ad hoc basis, but those efforts do take place and yield access to data.

Rear Admiral Tom Karsten: From a hydrographic perspective, we have close bilaterals with most of the Arctic states and therefore transmission of data by that means is relatively effective. Within the international space the International Hydrographic Organization is a very effective body in seeking to collaborate across borders. It is not quite as open in the Arctic as it is everywhere else in the world. The UK has sought to become an observer at the Arctic Regional Hydrographic Commission, but to date has not been able to achieve that. With respect to commercial survey, I think more work could be done in engaging with commercial activity to gain access to the data that have been secured for drilling or exploration purposes and use it for hydrographic purposes.

Lord Hunt of Chesterton: The Met Office has a system of sferics, which it operates almost globally, and is able to see much more lightning activity in very northern latitudes, which is important for many purposes. I have the feeling that in principle that is an open system. It used to be secret. Does that contribute to significant information about the changing environment?

Dr Richard Wood: I do not know the specifics of that, so I will have to get back to you.

Lord Hunt of Chesterton: It is a Met Office system. Sadly, it is not widely used even though it is on the internet, but it is an important part of the changing environment.

Q223 Viscount Hanworth: Can I go back to the question that was postponed? We asked for information about ocean circulation in order to feed into our predictions. Should that be enhanced? Is this matter really unpredictable, or do we have a handle on it?
Dr Richard Wood: I guess this arises from the question about the Gulf Stream or the North Atlantic overturning circulation.

Viscount Hanworth: There is also of course Jet Stream, if you want to include that in the whole complex system.

Dr Richard Wood: The latest state of the science is that that circulation is expected to weaken as a result of climate change and that will have an effect on climate all round the northern hemisphere. It may in some regions moderate the effects of global warming, for example. Therefore, that effect is built into climate models and is very well understood. The idea of a rapid collapse or shutdown is something that has happened in the past, but the consensus is that it is very unlikely over the 21st century. There are a few model simulations which suggest that it is possible in the 22nd century. It is important to keep researching it because there may be a commitment to that. You may be committed to that happening before you see it occur.

Within the Atlantic we are now monitoring that circulation much more closely than we were 10 years ago. We have developing observing systems everywhere south of the Greenland-Scotland axis and into the Atlantic. Within the Arctic itself, as I think you have heard from previous witnesses, observing the ocean state is extremely difficult. The ARGO buoys which pop up and down in the rest of the ocean cannot really operate under ice because they cannot surface. Therefore, we have to rely on a number of different technologies. There are some emerging technologies that will help us there. The ice-tethered profiler is one; the autonomous vehicle that can travel under ice is another. There is real promise of technology on the horizon to help us with this, but it is not there in a routine operational monitoring sense at the moment.
Viscount Hanworth: Things are on the way but we do not yet know their consequences.

Dr Richard Wood: Yes.

Q224 Lord Moynihan: While you have answered the question about whether there are sufficient data about the Arctic to make informed decisions about activities such as shipping, tourism and energy exploitation, perhaps you could go further and say whether there are any specific gaps that you would like to see filled. Let me ask the same question from a different perspective. If you were to sit down with your Canadian and Russian colleagues, or your Finnish, Swedish or Norwegian friends, with a significant budget at your disposal, what would you prioritise for collaboration in data collection, co-operation, research, modelling, monitoring stations and so on? Where would your priorities be if you had that budget? Where do we have competitive advantage in this country that could contribute to the benefit of all the Arctic nations? What would your list be?

Rod Johnson: I am very tempted by the idea of a large pot of money. I would start shopping with capability. The Icelanders have one long-range aircraft, the Danes can muster two, there is a standby C130 that the International Ice Patrol uses from the American side of things, but in terms of searching and covering the ground I would be looking for fixed-wing platforms, either through the state or some form of partnership arrangement with the private sector. I would certainly be looking at improving the resources available for international training and exercising. There were 1,000 personnel involved in SAREX Greenland Sea. There is a considerable cost there to be swallowed for training. However, because the environment is so harsh and the distances so huge, without increasing the tempo of training internationally it will take longer to uncover the lessons we need to learn to answer the question you have posed.
Roderick Johnson, Rear Admiral Tom Karsten RN and Dr Richard Wood – Oral evidence (QQ 214 – 225)

*Rear Admiral Tom Karsten:* In the Arctic, capacity is the same issue in hydrographic terms. In a perfect world, I would argue for open sharing of all information, open pooling of all hydrographic assets, and an opportunity to gain as much data as possible in the open waters across boundaries and share it.

From a UK perspective, what do we offer? I think we have significant cartographic skills given our responsibilities around the world and, given our activity in the Antarctic, we also have significant hydrographic surveying skills from operating in ice.

*Dr Richard Wood:* I will answer more from a research perspective. We absolutely have to work in the context of international research and, as the question suggested, play to our strengths. I would highlight two areas. One is observations of the detailed processes that are going on in the Arctic, for example in Arctic clouds, ocean mixing and so on, where the UK has excellent expertise. The other is the development of the models of all components of the climate system and, in particular, we have strength in coupling those models together—the oceans, ice, atmosphere and so on and the flows of energy and water between them. That leads us on to potential capabilities in more long-term forecasting, for example on seasonal timescales. It is very much a research problem but one where the UK is well placed to take a lead.

*Lord Hannay of Chiswick:* Admiral, if I understood your answer rightly, you were not looking to new hard material assets, you were saying that existing knowledge, if more widely shared, would be hugely valuable. Could you put your finger on who is preventing the sharing of that knowledge? Who currently possesses it? Are we to assume that is largely the United States and Russia, or is it wider than that?
Roderick Johnson, Rear Admiral Tom Karsten RN and Dr Richard Wood – Oral evidence (QQ 214 – 225)

**Rear Admiral Tom Karsten:** I do not think that is necessarily the case. From a national perspective, the sharing of hydrographic data is relatively well developed in the Arctic region. Perhaps more fruitful opportunities exist in engaging with commercial operators in the region who carry out surveys for different purposes, and it is a matter of ensuring we gain access to those data. There is inadequate capacity around the world for the sorts of sophisticated hydrographic surveys that need to be done. Therefore, I suspect there will always be a shortfall in the amount of up-to-date data that we would like to get our hands on.

**Q225 The Chairman:** Can I ask each of you for just one comment? One of the things the UK Parliament is particularly concentrating on is what the UK should be doing. I do not know whether each of you has one key thing in your own areas you would hope we might recommend in our report the UK Government do. Is there anything you have not gone through before that comes to mind?

**Dr Richard Wood:** I think it would be largely my answer to the previous question. Understanding the way energy, water and chemicals flow between the parts of the system in the Arctic is a particular research priority that we are very well placed to follow up.

**Rear Admiral Tom Karsten:** Briefly, it would be to continue to offer such expertise as we have for the greater good of hydrography around the world, particularly in the Arctic.

**Rod Johnson:** I think it would be to continue to support the UK’s current engagement with the other search and rescue services around the North Atlantic rim.

**Lord Hunt of Chesterton:** I think you referred to fixed-wing aircraft.

**Rod Johnson:** I have spoken a little about that.

**Lord Hunt of Chesterton:** Keep speaking.
The Chairman: We have reached our time limit. It has been a very useful session in all three of your specialist areas, which are ones that will feature very importantly as part of the fabric of our report. Thank you very much indeed.
This presentation is submitted as supplementary written evidence to the House of Lords Arctic Committee following its session of Tuesday 28th October 2014.

It is a series of slides first shown to the NATO Science for Peace and Security Programme at the Scott Polar Research Institute in October 2010 and again at the Royal United Services Institute in March 2011 at the Arctic Round Table meeting, on behalf of the North Atlantic Coast Guard Forum.

The submission is made by Mr Roderick Johnson, formerly the Chief Coastguard and Chairman of the North Atlantic Coast Guard Forum, as a supplement to oral evidence provided to the Committee.

**Anticipating Environmental Responses with Increasing Commercial Activity in the Arctic Ocean**
Coming up

- Function of the North Atlantic Coast Guard Forum
- Effects of climate change on shipping routes
- Practical effects of shipping on the environment
- Particular challenges of the Polar regions
20 Nations
Non political
Informal
Formed in 2007 Rotating
chairmanship Multilateral cooperation

Coast Guard Functions

Customs

Border Control

Pollution Response

Fisheries Control

Maritime Safety

Maritime Security

Vessel Traffic Management
Accident And Disaster Response

Search And Rescue
Risky Shipboard Operations

• Bunkering
  – Damaged hoses and leaking flanges
  – Failure of oil alarms
  – Inadequate coordination between ship crews and ship personnel during bunkering and cargo loading

• Loading or unloading of tankers in ice or open waters
  – Intraship oil transfer loss due to valve and pipe freezing
  – Disregard for washing procedures for cargo oil tanks on oil tankers and fuel oil tanks on other ships
  – Unseparated bilge water due to error

• Ballasting/Deballasting – Transfer of micro organisms, habitat destruction
Ballast Water

- Considered by the UN one of the ‘four greatest threats to global biodiversity’
- 3-5 billion tonnes of water moved per year
- Non-indigenous species can be introduced
- Species can cause significant environmental and economic harm

Chinese Mitten Crab (Eriocheir sinensis) most likely introduced to the UK through ships ballast – now commonly found in the Thames, its burrowing undermines flood defence
Control Of Ballast Water

- Governed by the IMO
  Ballast Water Convention 2005 – not yet in force
- Mandates management on ship
- Technology only partly in place, convention hoped to be in place by 2014
- UK has not yet implemented convention due to technology concerns

Comb Jelly (Mnemiopsis leidyi)
Introduced into Black Sea 1980’s
Consumed approx 75% of Zooplankton
Has disrupted entire food chain with significant harm to fisheries
Accidents to Ships

Grounding
- Hydrography
- Electronic Charts
- Commercial Pressure (eco tourism)
- Polar navigation

Collision
- Lookout
- Fog
- Ice navigation
• Fire
Roderick Johnson – Supplementary written evidence (ARC0065)
Response Challenges

- Poor transportation capacity for equipment, oil product and debris
- Longer traffic lanes and less coast wise and more transoceanic vessel movement
- Long distances
  - From central ports or airports
  - Not confined to ports, platforms or littoral proximity
- Remote locations without support resources
Response Challenges

• Different platforms affected by distance and remoteness differently
  – Helos more precise and ice capable but limited range
  – Aircraft longer range but limited ice capability
  – Ice breakers which are ice capable but not shallow water able
  – Small boats which are shallow water able but not ice capable
  – Each platform challenged by unique support requirements for fuel, repair, operational guidance
Roderick Johnson – Supplementary written evidence (ARC0065)
My name is Terry Audla. I am the President of Inuit Tapiriit Kanatami, the national organization representing 60,000 Canadian Inuit.

Canadian Inuit have much in common with the Inuit of Alaska, Greenland and the Chukotkan district of Russia. We number some 160,000 internationally.

The Arctic is our homeland. We call it Inuit Nunangat. It makes up 40% of Canada’s landmass and half its coastline. In sheer scope it compares somewhat with the size of Australia and India. Through our land claims agreements, Inuit control more than 50 million hectares of that land.

We have lived here for thousands of years and have developed a culture deeply rooted in our physical surroundings. The vast majority of us – some 70 percent – continue to rely on the land and sea for sustenance.

However, we are a modern people, and very well organized politically and economically. We are major investors in air and marine transport companies, fishing companies, and service industries for oil and gas development.

Inuktitut, our mother tongue, is the strongest Aboriginal language in Canada. To begin, I would like to give you a brief introduction. Unnusakkut means Good Afternoon. Qujannamiik means thank you. I thank you for the opportunity to appear before you today and look forward to answering any questions you might have.

**How has life changed for the Inuit of Northern Canada in recent decades? How are changes in the Arctic impacting upon the lives of Inuit communities and what are the positive and negative effects of such changes?**

In a matter of decades, Inuit have moved from igloos and skin tents to static communities and often inadequate and overcrowded houses. Where we used to get our food exclusively from the land and sea, many now shop for packaged items at exorbitant costs. Providing for a family until very recently entailed hunting, gathering, sewing and building. Yet, for the majority of Inuit, it now means going to school and getting a job.

Within the past 40 years, Canadian Inuit also concluded five contiguous land claims agreements stretching from one end of Canada to the other. These are constitutionally protected treaties between Inuit and the Crown and they form the basis of our relationship with the Government of Canada.

Land claims agreements provide us with tools for shaping our lives and developing our lands and resources. And they equip us with critical roles in the governance and economies of our regions and communities.
Over the course of several decades, we have fought to have a voice in discussions that affect our lives. On matters of resource development, our land claims organizations obligate governments and corporate entities to work in full partnership with us, and to ensure that their projects are to our long-term benefit.

To what extent are recent economic developments – such as mining and oil and gas projects – welcomed by Inuit in the Canadian Arctic? Do local people feel any economic and social benefit from such developments and how do they relate to campaigns for greater autonomy and resource rights for Inuit?

In 2009, Inuit ratified A Circumpolar Declaration on Sovereignty in the Arctic. It articulates the desire among Inuit to develop innovative and creative jurisdictional arrangements that balance our rights and responsibilities with those of states. Put simply, the old ways of doing business in the Arctic are gone. Any major decisions affecting the Arctic require transparent communication with Inuit, active and constructive partnership with Inuit, and, in many cases, appropriate consent of Inuit.

Various estimates suggest that a significant share of the world’s natural resources is located in the Arctic. In 2011, Inuit responded to this changing reality with a statement aimed at setting the context for resource development in the modern Arctic. A Circumpolar Inuit Declaration on Resource Development Principals says that development must be conducted in an environmentally responsible way, and must deliver direct and substantial benefit to Inuit.

We are beginning to see some benefits from such partnerships, but there remain significant questions regarding the impacts of such development on our land and wildlife. For that reason, there is no one-size-fits-all response to resource development enquiries. It is about striking a balance, and it is about making economic development work in tandem with social development.

Do international campaigns to protect and preserve Arctic environments and biodiversity reflect the views of the people who live in the region? To what extent do environmental NGOs involved in these campaigns consult with indigenous peoples such as the Canadian Inuit when developing their proposals for marine sanctuaries and species protection?

Let me begin by addressing the language of your question. You ask me about international campaigns to “protect” and “preserve” the Arctic. Regrettably Inuit see in these campaigns misguided attempts by governments and non-governmental organizations to fundamentally change our lives to suit their differently oriented moral standards. It wasn’t so long ago that such attitudes directed every aspect of our way of life. Back then it was known as colonialism.

It is deeply troubling when our knowledge and experiences are minimized or marginalized by non-Arctic countries. We see this time after time, but perhaps most blatantly on wildlife issues such as seal and polar bear trade...
The theme of political empowerment is particularly important when it comes to climate change, because Inuit feel the overarching influence of a warming planet in almost every aspect of our lives. We feel it when hunters become stranded due to unpredictable ice conditions. We feel it in the melting permafrost that compromises the foundations of our homes.

And yet, we are told by well-funded organizations and foreign governments that in the face of these impacts we must fundamentally change our way of life – what we wear, what we eat, how we feed our families, how we choose to make a living in the modern world. They assert that our activities should be changed because they may cause undue stress to our species and our environment, instead of examining whose way of life truly needs to be adjusted. In news stories, we are often portrayed as a simple people who don’t understand the science of conservation. In reality, we are the original conservationists, we are the true scientists.

Our citizens and yours are regularly called upon to “Save the Arctic.” At ITK, our battle cry calls on governments and civil society to respect Inuit knowledge, to empower us in our efforts to maintain our homeland as we have for thousands of years, and to provide us with the resources and the tools we need to overcome a history of repression and marginalization. We do not need to be saved. We need to be heard. To that end, I commend you for inviting us to speak today and I sincerely hope our message resonates in your forthcoming recommendations.

**How has the EU ban on seal products impacted upon Canadian Inuit? Do exemptions within the ban which are intended to support indigenous peoples work effectively? Do you welcome the progress made on this matter in recent Canada-EU negotiations?**

I must qualify my remarks by saying that they are without prejudice to ongoing litigation regarding the legislation. There is one more appeal for the European Court of Justice to decide upon. It deals with our case against the implementing measures of the seal ban, which was rejected by the General Court in April 2013. The court has not yet set a date for a hearing on that appeal.

Inuit in Canada have rights to harvest wildlife and to use wildlife for our everyday needs. This includes the need to carry on our livelihoods from the subsistence hunt. Europe and societies elsewhere need to be cognizant of the fact that most indigenous people across the world still depend upon wildlife resources and practices that have sustained them for millennia. Inuit require healthy markets to make this possible in a globalized economic environment. If one attacks hunting and trade, our livelihoods and modes of living are attacked.

As the UK Arctic Policy dictates, relations between the United Kingdom and Inuit should build on the basis of mutual respect and shared interests. Whatever the discrepancies in overall economic and political clout between Inuit and the UK and the EU, evolving principles of international law mean that Inuit are a necessary partner in Arctic affairs.
Regarding exemptions within the ban aimed at supporting Inuit, I must say that this feature has always seemed to us very much designed to ease European consciences, with precious little grasp of social, economic and cultural realities for Inuit.

EU consultants dispatched to Canada and Greenland to assess impact of the ban on Inuit reported that the regulation system contemplated for seal exports would impose substantive costs on Canadian Inuit. Days before the legislation was to come into force, the EU then published details of the Inuit exemption that institutionalize the very hardships its consultants identified.

Inuit responded to all this by bringing a lawsuit stating that the Inuit exemption regulations fail to meet the very modest “do no harm to Inuit” requirements of the enabling legislation itself.

As for recent Canada-EU negotiations, we await an invitation to take part in the design of any measures that may affect us. As we have said from the beginning, the only exemption that would have a chance of working for Inuit would be one negotiated with Inuit to the satisfaction of Inuit and providing guaranteed access for Inuit to the European market.

**To what extent does the Arctic Council take account of the views of indigenous communities? Are the Permanent Participants able to represent indigenous peoples effectively in Arctic Council meetings, given the financial costs of participation? To what extent do the Permanent Participants work together to pursue shared goals and how diverse are Arctic indigenous peoples in terms of their views and needs?**

The Inuit of Canada belong to a broader organization known as the Inuit Circumpolar Council, which includes representation by Inuit in Greenland, Alaska and Russia. For the next four years, Canada holds the chairmanship of ICC. The international chair is Okalik Eegeesiak. For a unique period in our history, the Government of Canada also concurrently holds the chairmanship of the Arctic Council and a Canadian Inuk, Minister Leona Aglukkaq, has been named to that post.

ICC has observer status at the United Nations, and is a Permanent Participant at the Arctic Council. ITK works closely with ICC and with its Canadian arm, ICC Canada. I am the Vice-President of ICC Canada, and so I am pleased to be able to provide you with some insight into these questions.

ICC has been active in various working groups and program areas of the Arctic Council and within the United Nations and its various subsidiary bodies. However, it is fair to say that funding – including the resources of the Indigenous Peoples’ Secretariat – has not kept pace with the increasing attention on the Arctic and the demands of Inuit in Canada and around the circumpolar world to respond.

There is an almost overwhelming amount of work going on in the Arctic Council. With our limited resources we struggle to keep up. We don’t currently have the capacity to attend and contribute to working groups and activities as we would like.
ICC works closely with fellow Arctic Council Permanent Participants, including the Saami Council, the Russian Association of Indigenous Peoples of the North (RAIPON), the Aleut International Association, the Gwich’in Council International and the Arctic Athabaskan Council, and it is fair to say that all Arctic indigenous organizations face similar ongoing financial challenges.

ICC predates the Arctic Council by about 20 years. It is critically important that ICC continues to play a strong role in such fora, including the Arctic Council, which is the most active intergovernmental forum on regional issues. As Inuit, we have always understood that change in the Arctic brings opportunities as well as challenges.

**Has the recent increase in the number of Arctic Council observer states had any effect on the ability of Permanent Participants to participate and to be “heard”? What, in your view, should be the role of observer states, such as the UK, within the Arctic Council?**

Inuit maintain that permanent observers to the Arctic Council must demonstrate a fundamental respect for the values of member states. For that reason, Inuit opposed entry of the European Union to the Arctic Council as it continued to defend its unlawful seal trade ban. For now, Canada and the EU have reached a compromise or sorts, but it remains to be seen whether Inuit will see lasting benefits from this arrangement.

It is worth noting that the chief architect of the Arctic Council was another Canadian Inuk, Mary Simon, who is also a former President of ITK. Mary has said that the inclusion of indigenous peoples as permanent participants was key to the design of the Arctic Council.

When the Arctic Council was created in 1996, such recognition of the role of indigenous groups was a revelation. However, since that time, the ranks of permanent observers has grown to the point where observers now outnumber member states and permanent participants.

Above all else, the role of permanent observers, including observer states, should be to support the work of Arctic nations, to respect the participation of indigenous peoples, and to encourage greater capacity for participation by indigenous representatives ahead of their own objectives.

*November 2014*
Examination of Witness

Terry Audla, President of Inuit Tapiriit Kanatami (ITK)

Q292  The Chairman: Mr Audla, good afternoon, or good morning for you I think. Can you hear me okay?

Terry Audla: Good afternoon. Yes, I can hear you fine, thank you.

The Chairman: Good. I think you are in Ottawa. Is that right?

Terry Audla: That is correct, I am in Ottawa.

The Chairman: Mr Audla, thank you very much indeed for appearing in front of the House of Lords Arctic Select Committee. This is our 23rd evidence session. We are very grateful to you for making yourself available. You should have had a copy of all our interests e-mailed to you. I will ask you to introduce yourself. We then have a number of questions, the shape of
which I think you are well aware. We will then move into a discussion about Arctic issues in your area. Does that sound good?

**Terry Audla**: Yes, thank you, my Lord Chairman. My name is Terry Audla. I am the president of Inuit Tapiriit Kanatami, which represents all Inuit in Canada. We number about 60,000 and we are growing in numbers. We live across Canada’s Arctic, mostly above the tree line. The map behind me shows the geographical region that I represent.

**Q293 The Chairman**: Thank you. I should say that I am Robin Teverson. I chair the Select Committee and I have around me a dozen of my colleagues, Members of the House of Lords, on the Committee. I will start by asking you how life has changed for the Inuit of northern Canada in recent decades. How are the changes in the Arctic impacting on the lives of those communities? What are the positives and negatives of those changes? After that I would like to move on to the land claims side, but perhaps you can begin with that general introduction of the current situation and how it has changed in northern Canada.

**Terry Audla**: Okay. I do not know how much time we have. I could go on for hours on that specific issue.

**The Chairman**: Let me answer that straightaway. It is a very good question. We have until 3 pm on our side, so effectively 55 minutes for the session as a whole.

**Terry Audla**: Okay, that is great. Thank you, my Lord Chairman. Specific to your question, in a matter of decades—a generation, if not two generations—Inuit have moved from igloos and seal-skin tents to static communities, often in inadequate and overcrowded homes. Where we used to get our food exclusively from the land and sea, many now shop for packaged items at exorbitant cost. Until very recently, providing for a family entailed hunting, gathering, sewing and building, yet for the majority of Inuit it now means going to school and getting a job.
Within the past 40 years, Canadian Inuit also concluded five contiguous land claim agreements, which we will get into in greater detail later, stretching from coast to coast. These are constitutionally protected treaties between Inuit and the Crown. They form the basis of our relationship with the Government of Canada. These land claim agreements provided us with tools for shaping our lives and developing our lands and resources. They equipped us with critical roles in the governance and economies of our regions and communities. Over the course of several decades, we have fought to have a voice in discussions that affect our lives. On matters of resource development, our land claim organisations obligate Governments and corporate entities to work in full partnership with us and to ensure that their projects are to our long-term benefit. Basically, those are the changes that we have seen in a very short amount of time. We are going through our own growing pains but we have managed to be quite successful in creating a formal relationship through our modern treaties with the Crown.

The Chairman: Thank you. Have the land agreements generally been seen as successful, even-handed deals that will last into the future successfully? Has the balance been correct? Is everybody on the whole satisfied with the outcome of those? Are they working in practice?

Terry Audla: The Inuit are very proud of their successes through the signing and ratification of these modern treaties. They are protected under Section 35 of the Canadian Constitution Act. When it comes to the implementation, that is a whole different—

The video-link was temporarily lost.

The Chairman: Hello again. I think we were talking about the land agreements, particularly their implementation and how that has taken place.
**Terry Audla:** Again, the Inuit were very proud to have been successful in the negotiation of these land claims. Just to give you an idea of the geographical scope, the map behind me shows you the geographical area. That represents 40% of Canada’s land-mass. The sheer scope of it compares to either Australia or India. The geographical area is almost similar in scope to the European Union. Within that area, Inuit have successfully negotiated actual titles to lands and have become one of the largest private landholders in the world. That area is equivalent to the size of Spain and Portugal. The geographical area in question also covers close to 50% of Canada’s coastline. In all those areas, Inuit, through their land claims, have a say in what happens with respect to any development, either renewable or non-renewable.

Now, the implementation side of it is another question: how much is the Government obligated? On their side, the Inuit feel they have been living up to the agreements and it is a matter of having the Government live up to their side as well—so far so good in today’s examples. It is a matter of coming to the table and coming to some agreement as to what needs to be implemented and what the obligations are. It is very legalistic. These are very comprehensive land claims. It is a matter of interpretation in a lot of cases.

**Q294 Lord Hannay of Chiswick:** Do you believe that the problems of the indigenous population in Canada, which you represent, and those of indigenous populations in other parts of the world outside the Arctic are very different, or are they basically broadly similar and need broadly similar responses from the international community, such as the United Nations Declaration on the Rights of Indigenous Peoples?

**Terry Audla:** Thank you for that question. Indigenous groups around the world are interestingly very similar in a broad sense: our voices and our opinions are not given the same weight in the countries in which we reside. Our organisation, Inuit Tapiriit Kanatami,
through its relations with the Inuit Circumpolar Council, of which I am vice-president for the Canadian division, has been quite successful in the drafting of the United Nations Declaration on the Rights of Indigenous Peoples. We feel that the Canadian model, with respect to the modern treaties, could be upheld as a model to other nations as to how they would work with their indigenous people. In that sense, we felt that we could assist other nations in working with their indigenous people.

In the cases of our socioeconomics and our physical and mental health—our well-being—we are not yet at par with the rest of Canada. This is the one thing that we are working hard towards in our organisation. When you look at the high drop-out rates at school, the tuberculosis rates and suicide rates among our people, we still have a long way to go to get to at least par with the rest of the nation. Sadly, that is true of other indigenous communities around the world. But in the case of Canada, through the work of our organisation and working in partnership with the regions and regional land claim organisations, we are working diligently to try to address them and at least get to par with the rest of the nation. We are not there yet. We are still a long way away. I hope that answers your question.

**Lord Hannay of Chiswick:** Yes, absolutely. Thank you very much.

**Q295 Lord Addington:** Hello Terry. Nice to see you again. To what extent do you think the recent economic developments have affected and been welcomed by the Inuit community? How do the local people feel that the economic and social benefits from such development affect them, and how do they relate to the campaign for greater autonomy and rights among your local people? How does all this tie together?

**Terry Audla:** That is a good question. Thank you my Lord Chairman, and Lord Addington—it was a pleasure to meet you at the Arctic Circle conference in Reykjavik. In 2009 the Inuit
ratified a circumpolar declaration on sovereignty in the Arctic, which articulates the desire among Inuit to develop innovative and creative jurisdictional arrangements that balance our rights and responsibilities with those of states. Put simply, the old ways of doing business in the Arctic are gone. Any major decisions affecting the Arctic require transparent communication, active and constructive partnership with the Inuit, and in many cases the appropriate consent of the Inuit.

Various estimates suggest that a significant share of the world’s natural resources are located in the Arctic. In 2011, Inuit responded to this changing reality with a statement aimed at setting the context for resource development in the modern Arctic. Another circumpolar Inuit declaration was passed on resource development principles, which says that development must be conducted in an environmentally responsible way and must deliver direct and substantial benefit to Inuit. We are beginning to see some benefits from such partnerships, but there remain significant questions regarding the impacts of such development on our land and wildlife. For that reason, there is no one-size-fits-all response to resource development inquiries. It is about striking a balance and making economic development work in tandem with social development—wherein lies the trick of trying to keep that balance so that it is done in an environmentally responsible manner, as well as a socially responsible manner. Based on the fact that we have these successful modern treaties, we welcome any resource-extraction industries, so long as they cross their “t”s, dot their “i”s, do their due diligence and ensure, if they come into the Arctic, that they are coming in with their eyes wide open and are aware of the land claim requirements, as well as the need to be respectful of the people and Inuit who live in the Arctic—to include them in the decision-making process. In this day and age we are no longer just the employees; we are also the employers.
Lord Addington: To follow up on that, would you say that you have good models of where you have enhanced the skill base of the community and your economic activity outwith that initial interaction? Are there examples there that you think we should know about and should be models for future development?

Terry Audla: You have probably heard examples of what not to do from the insurance industry. I can give you examples of the American Gulf disaster and the Italian cruise ship disaster. Insurance companies require the industry to ensure that they do their due diligence, and if they go to areas where they will experience extreme climates and conditions, that they go in with eyes wide open.

Good examples would probably be some of the current projects that are operating in Canada’s north. Baffinland, on the northern tip of Baffin Island near Pond Inlet, is on lands where Inuit own the minerals. They are extracting what I call “Inuit iron ore”. We are collecting the royalties on the extraction and have successfully negotiated an impacts and benefits agreement where we require minimum employment goals to ensure that Inuit are included in the whole scheme of ensuring that Inuit are gainfully employed, as well as being given the opportunity to advance into other areas. We are looking not just at heavy equipment operators but at potential engineers, based on the fact that this specific project may have a 100-year life. Being that it is multigenerational, we need to ensure that Inuit benefit and that mitigative requirements are met to ensure there is as little damage to the environment as possible.

Lord Hunt of Chesterton: As a supplementary, would you not agree with some historians who would say that the way you have developed your agreements with the Canadian Government is in part because of the constitution of Canada, which was agreed a long time ago in this strange Parliament we are in? It is a very different constitution from that of the
United States. I have been to the United States and have seen that Native Americans have had not nearly the good constitutional fortune that there is in Canada. Therefore, the whole global question of indigenous peoples is surely in part due to the way the various constitutions originated. Is there something to be said about that?

_Terry Audla_: Yes, I totally agree with that question. Being that we are a Commonwealth nation, the Inuit were quite instrumental in ensuring that we had specific constitutional protection in the repatriation of our constitution in, I believe, 1985. Again, that is in Section 35 of the Canadian Constitution Act, which we helped to develop and which opened up the modern treaty that we entered into. We have our counterparts: I mentioned the Inuit Circumpolar Council, and there are also our fellow Inuit in Greenland, in Alaska, and in the northern Chukotka region. We are quite well organised in being able to exchange notes on successes and failures. We know that the indigenous people in Alaska have a more difficult time getting the US Government to recognise their indigenous rights respecting titles and/or historical use and occupancy of the area in which they reside. They have been successful in partnering with the resource-extractive industry in that part of the world.

Greenland is working towards self-rule to become more autonomous from Denmark. I am not too sure about the Danish constitution and how they recognise their indigenous people, but because of our well organised circumpolar division we are able to ensure that we have what we call best practices or examples to assist whichever Inuit group we need to deal with.

_Q296 Lord Hunt of Chesterton_: Thank you. I am meant to ask you another question, in fact, about international campaigns to protect and preserve the Arctic environment and biodiversity. I wonder how those campaigns relate to the views of indigenous people in
these areas, which we have heard causes considerable stresses and argument. Perhaps you would like to comment on that.

_Terry Audla_: Yes. It is too bad that we have less than an hour to go into this question. Thank you for that question, my Lord Chairman. Let me begin by addressing the language of the question. You asked me about international campaigns that attempt to “protect and preserve” the Arctic. Regrettably, Inuit see these campaigns as misguided attempts by government and non-governmental organisations to fundamentally change our lives to suit their differently oriented moral standards. It was not so long ago that such attitudes directed every aspect of our way of life. Back then we called it colonialism. It is deeply troubling when our knowledge and experiences are minimised or marginalised. Our knowledge and experiences are quite effective and have been effective for our people to be able to survive for centuries in one of the harshest climates on the planet. We see this time after time, perhaps most blatantly on wildlife issues such as our seal and polar bear trade.

The theme of political empowerment is particularly important when it comes to climate change. Inuit feel the overarching influence of a warming planet in almost every aspect of our lives. We feel it when hunters become stranded due to unpredictable ice conditions. We feel it in the melting permafrost, which compromises the foundations of our very homes. Yet we are told by well funded organisations and foreign Governments that in the face of these impacts we must fundamentally change our way of life. I am talking specifically about the Inuit way of life: what we wear, what we eat, how we feed our families, how we choose to make a living in the modern world. They assert that our activities should be changed because they think it may cause undue stress to our species, wildlife and environment, instead of examining whose way of life truly needs to be adjusted. In Reykjavik recently I suggested to campaign movements such as “Save the Arctic” that climate change and
carbon dioxide emissions are stemming not from the Arctic but from the industrialised nations. If you truly want to save the Arctic, you need to look in your own backyard.

This is the argument I make: the Inuit in the Arctic have to be given the opportunity to come up with their own decisions with respect to our way of life, how we determine our future and how we can take advantage of the renewable and non-renewable resources around us. In news stories we are often portrayed as a simple people who do not understand the science of conservation. In reality, we are the original conservationists and we are the true scientists when it comes to the Arctic wildlife—the flora and fauna. Our citizens and yours are regularly called upon to save the Arctic. Our battle cry calls on Government and civil society to respect Inuit knowledge, to empower and support us in our efforts to maintain our homeland, as we have for thousands of years, and to provide us with the resources and tools we need to overcome a history of repression and marginalisation. We do not need to be saved, but we do need to be heard and respected. To that end, I commend you for inviting us to speak today. I sincerely hope that our message resonates in your forthcoming recommendations.

Q297 Lord Hannay of Chiswick: Could we now look at a very specific issue: the European Union’s ban on seal products? Could you say a little about the impact it had on the Canadian Inuit? Could you also comment on whether the exemptions in the ban, which are intended to support indigenous people, work effectively? Thirdly, are you joined with the Canadian Government in welcoming the progress made on this matter in recent Canadian negotiations with the European Union?

Terry Audla: Thank you for those questions, my Lord Chairman. I will qualify my remarks by saying that they are without prejudice to ongoing litigation regarding the legislation. There is one more appeal before the European Court of Justice to be decided upon. It deals with
the case of our organisation, Inuit Tapiriit Kanatami, against the implementing measures of the seal ban, which was rejected by the General Court in April 2013. The court has not yet set a date for hearing that appeal.

Inuit in Canada have rights to harvest wildlife and to use wildlife for our everyday needs. This includes the need to carry on our livelihoods from the subsistence hunt. Europe and societies elsewhere need to be cognisant of the fact that most indigenous people across the world still depend on wildlife resources and practices that have sustained them for millennia. Inuit require healthy markets to make this possible in a globalised economic environment. If one attacks hunting and trade, our livelihoods and modes of living are attacked. As the UK Arctic policy dictates, relations between the United Kingdom and Inuit should build on the basis of mutual respect and shared interest. Whatever the discrepancies in overall economic and political clout between Inuit, the UK and the EU, evolving principles of international law mean that Inuit are a necessary partner in Arctic affairs.

Regarding the exemption in the ban aimed at supporting Inuit, I must say that this feature has always seemed to us very much designed to ease European consciences—

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EU consultants dispatched to Canada and Greenland to assess the impacts of the ban on Inuit reported that the regulation system contemplated for seal exports would impose substantive costs on Canadian Inuit. Days before legislation was to come into force, the EU published details of the Inuit exemption that institutionalise the very hardships its consultants identified.

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Terry Audla: Are we back on?
The Chairman: Yes, we are. I think you have notes on that question. We missed some of that and I do not want to start again. If you could let us have those and e-mail them to our clerk, that would be very useful. If you want to finish the question, then please do. Your notes would be useful as well. Thank you.

Terry Audla: Sure. Thank you, my Lord Chairman. I will send them to you right after this presentation. Continuing with the question, Inuit responded to all this by bringing a lawsuit, stating that the Inuit exemption regulations failed to meet the very modest “do no harm to Inuit” requirements of the enabling legislation.

As for recent Canada-EU negotiations, we await an invitation to take part in the design of any measures that may affect us. As we have said from the beginning, the only exemption that would have a chance of working for Inuit would be one negotiated with Inuit to the satisfaction of Inuit and providing guaranteed access for Inuit to the European market. From the very beginning we have always said that any ban on the seal trade has to be based on science. If you were to look at all the bans around the world, starting with the 1972 ban by the United States, that ban was ill informed and again based on morals. The question I would shoot back is: whose morals trump whose morals? That is the very issue of the principles around the seal ban. I would not necessarily go into the UK and do that.

Q298 Lord Hannay of Chiswick: Could I just ask whether you accept, or not, that in theory an exemption that was properly applied and did not impose additional costs on you but did certify that the products being produced by Inuit people were able to be traded into Europe would be useful to you if it could be done?

Terry Audla: If it was done to the full extent of its possibilities. If you look at the geographical area on the map behind me, we have always relied on the east coast seal market in the south, off the coast of Newfoundland, based on the fact that they had all the
capital infrastructure requirements for the processing and tanning of the seal products. Now, because of the ban, we are going to have to look realistically at how we will take advantage of the exemption and whether or not the market will open up once again so that it becomes more profitable for the Inuit. Again, everything that we have done with respect to our wildlife has never been reliant on the market; what we hunt is for subsistence purposes.

The spin-off to that would be the market value of the pelt. If the European Union was serious it would assist in the marketing of the Inuit seal products: put them on the Italian and Paris runways, Italian shoes made out of seal skin, what have you. The leather seats that you sit in could be made out of seal products. That would again be something that Inuit would seriously consider as a success.

I grew up in communities that had a healthy vitality based on the fact that they were able to go out on their subsistence hunts and were able to sell the fur at fair market value. We were very self-reliant, but because of the bans that have happened since the early 1970s we are now turning to our Governments with our hands out and are becoming wards of the state because of the welfare system. Again, this is something that we need to seriously look at. If you are to ban a product, you need to think seriously about the science and the facts behind it. Can you not leave it to the consumer to decide whether or not they want the product? Should it be legislated? This is where the House of Lords, the parliamentarians and everyone else are selected to be the deciders: the ones who decide whether or not it is true, factual and for the common good—

The Chairman: I think we are going to need to move on in just a second.

Lord Hannay of Chiswick: Thank you very much. That is a very full and useful answer.

Terry Audla: I could go on. Thank you for the question.
Q299 Baroness Neville-Jones: Mr Audla, could we turn to the Arctic Council, which is obviously an important body in the Arctic context? We would be very grateful to hear what you think about the way the views of the indigenous communities are represented. Do you feel that the council is able and willing to take proper account of the views that are expressed to them by the Permanent Participants? Do you feel that the means extended to the Permanent Participants to represent indigenous peoples are adequate? There are costs involved. I would be interested to know what you feel about how effectively you are able to make your role and your views felt in the Arctic Council.

Terry Audla: Thank you for that question. As I mentioned, the Inuit of Canada belong to a broader organisation known as the Inuit Circumpolar Council, which includes representation of Inuit from Alaska, Greenland and northern Russia. For the next four years, Canada holds the chairmanship of the ICC. The international chair is Okalik Eegeesiak. For a unique period in our history, the Government in Canada also concurrently hold the chairmanship of the Arctic Council. A Canadian Inuk, Minister Leona Aglukkaq, has been named to that post. ICC has observer status at the United Nations and is a Permanent Participant at the Arctic Council.

The ITK works closely with the ICC and with its Canadian arm, ICC Canada. I mentioned earlier that I am vice-president of ICC Canada, so I am pleased to be able to provide you with some insight. We have been active in various working groups and programme areas of the Arctic Council and within the United Nations and its various subsidiary bodies. However, it is fair to say that funding has not kept pace with the increasing attention on the Arctic, the demands of the Inuit in Canada and the ability of the circumpolar region to respond. There is an almost overwhelming amount of important work going on in the Arctic Council. With our limited resources, we struggle to keep up. We do not currently have the capacity to
attend and contribute to working groups and activities as we would like, but we do work closely with fellow Arctic Council Permanent Participants, including the Saami Council, the Russian Association of Indigenous Peoples of the North, the Aleut International Association, the Gwich’in Council International and the Arctic Athabaskan Council. It is fair to say that all Arctic indigenous organisations face similar ongoing financial challenges.

Interestingly enough, the ICC pre-dates the Arctic Council by about 20 years. It is critical that the ICC continues to play a strong role in such fora, including the Arctic Council, which is the most active intergovernmental forum on regional issues. As Inuit, we have always understood that change in the Arctic brings opportunities as well as challenges. Based on that fact, and as we participate as Permanent Participants, another thing that we need to look at is how other observers would affect our voice in the Arctic Council.

**Baroness Neville-Jones:** Are you worried about others joining in as observers? Do you think that might dilute your influence? It might strengthen the body, of course.

**Terry Audla:** Our voice might potentially be diluted, but we maintain that permanent observers to the Arctic Council must demonstrate a fundamental respect for the values of the member states. For that reason, Inuit oppose the entry of the European Union to the Arctic Council as it continues to defend its unlawful seal trade ban. We feel that any observer coming into the Arctic Council has to be able to show that it can make decisions that are intelligent and based on scientific fact, as well as to be inclusive with respect to the traditional knowledge of the indigenous people who live in the Arctic.

It is worth noting that the chief architect of the Arctic Council was another Canadian Inuk, Mary Simon, who is also a former president of the ITK, over which I now reside. Mary has said that the inclusion of indigenous peoples as Permanent Participants was key to the design of the Arctic Council. When the Arctic Council was created in 1996, such recognition
of the role of indigenous groups was a revelation. However, since that time the ranks of permanent observers has grown to the point where observers now outnumber the member states and Permanent Participants. Above all else, the role of permanent observers, including observer states, should be to support the work of Arctic nations to respect the participation of indigenous peoples and to encourage greater capacity for participation by indigenous representatives ahead of their own objectives.

**Baroness Neville-Jones:** Can I ask one supplementary, Lord Chairman?

**The Chairman:** Mr Audla, we will be short of time soon. A number of Members want to ask you supplementaries. Perhaps we can keep the questions and answers relatively short for the rest of the session so that we ensure we get through the topics.

**Baroness Neville-Jones:** My supplementary, if you do not mind, is to try to pin you down a little on your view of EU observer status. As things stand, are you opposed to the EU’s application for observer status, on the grounds that you have stated? You have called the ban on seal hunting “illegal”. What view do you take on EU observer status?

**Terry Audla:** The Inuit first recommended that we decline the EU’s application for observer status based on what we felt was an illegal seal ban. If we could extend that to the United States—they were the first ones to ban the seal trade—we would try to do that too, but that is not necessarily possible at the moment. One thing we want to emphasise is that if the seal ban is going to try to develop its exemption clause to the fullest so that Inuit seal products are exempt, we would seriously reconsider based on how serious they are. But again, our principled approach has always been that if you are going to make decisions based on morals, we are not interested in your participation. What we want are for true, scientific, factual observations to be included in the discussions.
Lord Hannay of Chiswick: So there are four members of the Arctic Council that you consider to be improperly members of the council because they ban seal products: the United States, Denmark, Finland and Sweden. But the EU, which is after all not floating in the ether—it is just the representative of its 28 member states, of whom three are on the council—is somehow in a different category. Why so?

Terry Audla: I have been asked that a number of times. The Russians have a seal ban as well. I gave the example of the US having banned the seal trade back in the early to mid-1970s. If the Inuit had been as organised as they are today, given that we are better organised and that the information goes out to all parts of the world at light speed—here I am presenting before the House of Lords through videoconferencing—if we had the same technology back then we would have fought tooth and nail against these bans. If we wanted to fight Russia we would have to look at our options. Is fighting Russia going to get anywhere? Do diplomatic discussions with Russia accomplish anything? When it comes to the EU, being that it represents all those states, we felt that that was a perfect fight, based on its sheer size and the fact that it comprises democratic countries that listen to reason. We felt we would have a better approach with respect to that. We are not trying to use the EU as an example.

The Chairman: Thank you. I think that is a good answer. I need to move on to a couple of supplementaries on this general area.

Q300 Lord Soley: It is clear from your answers that the ICC is important to you. How important is the Indigenous Peoples Secretariat? I gather that the ICC is one of the six permanent groups supported by the Indigenous Peoples Secretariat. How important is that organisation? When you refer to lack of resources, are you thinking of organisations such as that?
Terry Audla: I am sorry, you were cutting in and out. I caught part of that question. Is it specific to the ICC?

Lord Soley: It is a question about the importance of the Indigenous Peoples Secretariat, of which the ICC is one of the six permanent groups it supports. How important is that organisation? Were you thinking of it when you talked about lack of resources?

Terry Audla: Yes, it is very important. I have mentioned that our chair, Okalik Eegeesiak, who was recently appointed this past summer, is from Canada. ITK, the organisation that I represent, also participates at that level. I sit as the ICC Canada vice-president. But as I mentioned, because of what I called the interests of the world with respect to the Arctic, our views are very important. We are sought after to gain our views, but there are just so many of us. At the same time we have limited resources with respect to being able to travel or participate at certain conferences and/or working groups through the Arctic Council. We are being stretched. We feel that the role of the ICC has to be given more weight and resources to be able to fully participate.

Lord Soley: It might be useful if you could send us a short note on how the resources are necessary and what resources are necessary to make either the IPS or the ICC more effective.

The Chairman: We would be very grateful if you could do that.

Lord Oxburgh: I have a couple of factual questions, please. You mentioned that you have about 60,000 people. Is that population static, growing or declining? Secondly, related to that, what proportion of that 60,000 tries to follow the traditional day of life? Thirdly, do you have many people going south and leaving your communities?

Terry Audla: Thank you for those questions. We have one of the highest birth rates in Canada; that figure of 60,000 is growing. It is going to increase quite rapidly over the next
few decades or so, based on the high birth rate. Not many are going south. With respect to reliance on our traditional way of life, two-thirds of our diet is reliant on the bounty of the land and sea in the area. If we did not have that two-thirds, you would see third-world situations in Canada’s Arctic just based on the exorbitant cost of southern-made products being shipped up north by either—

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**Terry Audla:** Very quickly on that last question, we feel that our way of life is very dependent on our traditional hunts. A large majority still exercise that lifestyle.

**Lord Oxburgh:** So if your population continues to grow, it will become more difficult.

**Terry Audla:** That depends. When the Save the Arctic movement and people want a moratorium on oil and gas development, mineral development or fisheries, that limits our ability to become self-reliant. We do not want to be a burden to society. We want to be able to increase our self-reliance and be able to take full advantage of all the resources at hand, be they renewable or non-renewable.

**Lord Oxburgh:** Thank you very much indeed.

**The Chairman:** Did you have one last question, Lord Soley?

**Q301 Lord Soley:** Yes, one last one. You mentioned Russia and the difficulties of dealing with Russia. Can you tell us a little about how the Inuit population in northern Russia are able to relate to the Russian Government? Is there any effective voice for them there, or are they reliant on just working through the Arctic Council? How do they make their voice heard, if at all?

**Terry Audla:** That is a very good question. They are included in our Inuit Circumpolar Council, but they are not recognised as well as they should be in northern Russia. The member states of the Inuit Circumpolar Council—Alaska, Canada and Greenland—have to
do fundraising drives to ensure that their voices are included and that they participate at our own general meetings when it comes to the ICC. In that respect, they are not recognised or resourced enough.

**Lord Soley:** Thank you for that.

**The Chairman:** Mr Audla, thank you very much. I am sorry about the communication difficulties on occasions, but we are very grateful for your participation. If you were able to send us a copy of your notes, I am sure that they would be useful as well. We intended to publish our report in February. First nations and indigenous peoples will be an important part of that. Thank you very much indeed for having contributed that evidence. We will work through our recommendations between now and February. Thank you very much indeed. I bring this public session of the Committee to an end.
Summary of key points

a) A significant proportion of Arctic biodiversity is migratory and is shared with other parts of the world, especially with the UK; we, and other relevant countries, each have reciprocal responsibilities for the conservation of this shared biodiversity;

b) rapid changes currently occurring in the Arctic, due to climate change especially, have direct consequences for those shared species and populations that winter in, or migrate through, the UK

c) these changes in the Arctic may compromise the achievement here of conservation objectives (for species or protected sites) due to factors which are beyond the influence of national policy;

d) monitoring and surveillance of migratory Arctic wildlife undertaken when species are concentrated in the UK can provide highly cost-effective indicators of change in different parts of the Arctic but we need to make better use of such datasets and improve mechanisms for sharing this information with other relevant countries;

e) there are a range of Multi-lateral Environmental Agreements, including the working groups of the Arctic Council, which enable UK to influence and inform the conservation of Arctic biodiversity, including through the provision of data on trends in migratory species (for example Decision XI.6\(^52\) of the Convention on Biological Diversity), and so contribute to achieving the internationally agreed Aichi biodiversity targets\(^53\).


\(^{53}\) [http://www.cbd.int/sp/targets/](http://www.cbd.int/sp/targets/)
Submission by the Joint Nature Conservation Committee

Introduction

1. The Joint Nature Conservation Committee (JNCC) is the statutory adviser to Government and devolved administrations on UK and international nature conservation, on behalf of the Council for Nature Conservation and the Countryside, Natural England, Natural Resources Wales and Scottish Natural Heritage. Its work contributes to maintaining and enriching biological diversity, conserving geological features and sustaining natural systems. JNCC’s advice is set in the context of the desirability of contributing to sustainable development.

2. We welcome the opportunity to submit evidence to this inquiry. Our comments here focus on those components of biodiversity that the United Kingdom (UK) shares with the Arctic and for which a better understanding of trends may provide indicators of environmental change in the Arctic. Such indicators might then inform future policy interventions by the UK, Arctic states and others and so contribute to measures to achieve the environmental component of sustainable development.

3. Accordingly, our focus is on three of the topics identified by the Committee for consideration by the inquiry, namely:

   i) What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?

   v) Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?

   vii) Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

Shared UK-Arctic biodiversity

4. Before addressing the questions identified by the inquiry, we first describe how the UK and the Arctic share significant components of their biodiversity.

5. First, many species that have a circumpolar Arctic distribution also have outlying native populations within the UK. These include species such as Arctic char and some relict Arctic-alpine plants typical especially of the Scottish uplands (but pressures on such species here are unlikely to indicate the impacts of the more rapid change in the Arctic itself).

6. Second, and more significantly, many Arctic species, especially birds and some marine mammals, are migratory and spend much of the year in non-Arctic countries who thus share with their Arctic counterparts reciprocal responsibility for their conservation. The UK is
especially important in this respect as, each winter, we host significant numbers of birds from seven of the eight Arctic countries (the only exception being from Alaska, USA54). Several million individuals of 85 species of Arctic bird winter in, or migrate through, the UK (e.g. Annexes 1 & 2). For some swan, goose and wader species, the UK (with Ireland) supports entire populations of some species and large proportions of others (e.g. Annex 3).

7. Of 25 breeding seabird species that breed in the UK only 6 do not also breed in the Arctic, and of 25 species breeding in the Atlantic sector of the Arctic only 6 do not breed in UK. Many individuals of several species of seabird migrate to and through UK and its territorial waters after breeding in the Arctic. Some species breeding in the UK also range widely to the north in the non-breeding season; some individuals and species, for example the fulmar, even exploit Arctic waters while breeding in the UK. The UK is the southernmost part of the range of other Arctic birds, such as the Faroese - southern Icelandic race of the common eider.

8. For UK statutory purposes, including obligations under EU Directive on the conservation of wild birds (2009/147/EC – ‘the Birds Directive’), the bio-geographical context in which conservation needs of many migratory bird populations are considered includes Arctic regions.

9. Other wide-ranging marine mammal species also have ranges that include UK and Arctic waters – perhaps at least a dozen species – and probably many more species of fish. The marine ecosystem of the North Atlantic, including UK and Arctic seas, is differentiated less on an ecological scale than on a political one.

What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?

10. Weather, and thus climate, has both direct and indirect influences on migratory birds breeding in the Arctic. Patterns of winter snow fall and spring snow melt are particularly important and may have multiple effects.

11. Climate change might affect breeding migratory birds through habitat loss or change; changed timing of migrations (with the risk of ‘phenological mis-match’55); increased predation by, or competition with, species newly spreading into areas or changed behaviour of established predators; changes to availability of food resources; spread of novel diseases and parasites; and enhanced risk of oil and other pollution resulting from greater access to the Arctic by shipping or from oil and gas exploitation.

12. Changes in the Arctic which affect biodiversity there are thus also likely to affect some of ‘our’ wildlife here too. Under the EU Birds Directive the UK has fulfilled its obligations to

54 The UK’s Overseas Territory of Pitcairn Islands in the Pacific supports over-wintering long distance migrant waders such as bristle-thighed curlew which breed in Alaska.

55 ‘Phenological mis-match’ refers to when the timing of biological events, such as breeding, no longer coincide with, for example, peaks of food availability
Joint Nature Conservation Committee – Written evidence (ARC0059)

classify many Special Protection Areas (SPAs) for such migratory species, including, for example, designating most of our major estuaries and other wetlands. In the 1990s, over 2,100,000 non-breeding waterbirds were calculated to use the UK SPA network, most of which came from the Arctic.

13. Significant conservation resources in the UK are devoted to management and conservation of wintering / passage Arctic birds. These include the protection of internationally (or nationally) important sites as SPAs (including those at sea), as wetlands of international importance under the Ramsar Convention, and as Sites (or Areas) of Special Scientific Interest. Resources are also committed to managing agricultural conflict where these arise (especially with wintering geese populations).

14. Yet the ability to maintain the favourable conservation status of the birds that use these areas (such as those listed in Annex 1) will depend not only on the ‘local’ management of these wintering sites, but also on factors affecting them on their Arctic breeding grounds. It is likely that UK conservation goals, for species or protected sites, will be compromised by factors operating in the Arctic over which we have little direct policy influence (but see paragraph 22). Annex 4 provides an example of decline in numbers of Greenland white-fronted geese wintering in Britain & Ireland due to factors affecting productivity on the breeding grounds.

**Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?**

**UK conservation and surveillance of Arctic species**

15. The UK also devotes significant resources to the monitoring and surveillance of shared populations of Arctic birds that winter here. The UK is notable for our long-term monitoring datasets (including abundance, trends and, in some cases, productivity) for wintering wildfowl and waders, which date back to 1947, and for seabirds, which date back to 1989 on a national basis (and for much longer for some individual species such as fulmar). These data are reliant on significant input from very many volunteer surveyors/counters and are co-ordinated by partnerships involving JNCC on behalf of government and a number of conservation NGOs. Such data are globally significant sustaining these monitoring schemes is important given the science now flowing from 60 years of surveillance – especially in the context of assessment of change.

16. Many Arctic birds wintering in the UK are typically concentrated in a relatively few discrete sites with high site fidelity for some populations (for example, the entire Svalbard population of barnacle geese winters on the inner Solway Firth) making monitoring of population size and productivity both relatively simple and cost-effective (supported by the use of large numbers of volunteers). By contrast, Arctic birds in the breeding season are dispersed at low densities over enormous areas of difficult terrain making monitoring difficult and expensive if, indeed, it is actually feasible.

56 [http://jncc.defra.gov.uk/page-6873](http://jncc.defra.gov.uk/page-6873)
17. UK data (and those of other relevant EU Member States) are thus highly relevant to monitoring of Arctic biodiversity – some trends already observed here include ‘short-stopping’ and changed migration phenology, both linked to climate change.

18. These UK data are available, indirectly, to contribute to circumpolar assessments but the processes for doing so have scope for development and this is currently being explored.

19. There is also scope to use these UK-collected data on Arctic species to contribute to ‘smarter’ indices of change in the Arctic with the emphasis on making better use of existing datasets, through novel analysis, rather than seeking to collect and compile new data (in effect a biological form of ‘remote sensing’ or monitoring at a distance). Notable in this context are the long time-series involved for many of these datasets.

Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

International agreements

20. A number of international agreements relevant to the Arctic provide opportunities for the UK to have some influence on, and provide evidence in support of, multi-lateral approaches to conserving Arctic biodiversity.

21. Overall, we believe the current range of international agreements (see below for recent developments) on biodiversity provide a sufficient range of mechanisms to guide and enable international cooperation for the conservation of shared Arctic biodiversity. They also provide a means by which the UK, and other non-Arctic countries, can engage with Arctic countries over factors affecting shared populations on their Arctic breeding grounds and seek to address these issues multi-laterally.

22. The UK government is an observer to the Arctic Council. JNCC has links into one of the Arctic Council working groups – namely CAFF (Conservation of Arctic Flora & Fauna) and especially to their seabird working group (CBIRD) in which JNCC is a regular participant and with whom we share data. For example, the CBIRD group are analysing global population trends in kittiwakes including data from the UK.

23. Whilst JNCC already collaborates with CAFF as described, we need to ensure that CAFF is aware of all our datasets and that these are readily available to them to contribute to pan-Arctic trend analyses and other assessments (such as the 2013 Arctic Biodiversity Assessment).

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57 Where species or populations which may formerly have wintered in the UK, now winter elsewhere in sites closer to their breeding grounds (because winters are now sufficiently mild there).
58 [http://www.caff.is/](http://www.caff.is/)
59 [http://www.arcticbiodiversity.is/](http://www.arcticbiodiversity.is/)

Page 737 of 1144
24. Issues relating to Arctic biodiversity have recently been the subject of attention at a number of Multi-lateral Environmental Agreements (MEAs).

25. Arctic biodiversity was subject of a Decision (XI.6) at the 11th Conference of the Parties to the Convention on Biological Diversity (CBD; 2012). In this Decision, the UK and other EU Member States inter alia successfully sought specific actions on sharing data on migratory Arctic species, supported greater collaboration between CAFF & CBD and encouraged greater work on marine Ecologically and Biologically Significant Areas (EBSAs) in the Arctic, especially in collaboration with OSPAR Convention.

26. Subsequently, at the 12th Conference of the Parties to the CBD (October 2014) a number of EBSAs in the Arctic and adjoining waters of the NW Atlantic were approved for submission to the EBSA repository and to the General Assembly of the United Nations and particularly its Ad Hoc Open-ended Informal Working Group on the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction.

27. The UK & EU (and many Arctic states) are already Party to a number of MEAs that enable international cooperation for shared biodiversity – e.g. through Convention on Migratory Species (CMS) and its subsidiary agreements such as the Agreement on the conservation of African-Eurasian migratory waterbirds (AEWA) and also through some single species international action plans (e.g. for Greenland white-fronted geese, involving the UK, Ireland, Iceland and Greenland). AEWA has always seen engagement with Arctic countries as central to the delivery of integrated approaches to the conservation of waterbirds across their whole migratory ranges. Finland, Sweden & Norway have long been Contracting Parties of AEWA with Iceland joining in 2013.

28. The recent 11th Conference of the Parties to CMS (November 2014, Quito, Ecuador) passed a number of Resolutions relevant to conservation in the Arctic, noting especially the rapidity of Arctic change, including on climate change, a programme of work on migratory birds, ecological networks, management of marine debris, and listed polar bear (Ursus maritimus) on CMS Appendix II. These follow Resolutions agreed at the 10th Conference of the Parties (Resolution 10.15 global programme of work on cetaceans; 10.19 migratory species conservation in the light of climate change) which specifically referred to the Arctic.

29. The Ramsar Convention on wetlands has sought to promote integrated ‘flyway’-scale approaches to the conservation of migratory waterbirds, linking conservation needs in the Arctic with those elsewhere on migratory flyways (e.g through Resolution X.22 Promoting international cooperation for the conservation of waterbird flyways); the UK has been supportive of such initiatives and their follow-up actions.

61 http://www.ospar.org/
30. The Convention on International Trade in Endangered Species (CITES) also addresses the sustainability of international trade in a number of Arctic species listed in its Appendices; recent debates have focused on polar bears, trade in which is now to be scrutinised by the CITES Animals Committee through its review of significant trade.

31. The OSPAR Convention for the protection of the marine environment of the north-east Atlantic aims inter alia to establish an ecologically coherent network of marine protected areas (MPAs) in each of its five identified regions. Region I comprises Arctic waters, and to date, three large MPAs have been designated there, with a further seven nominated.

32. The preamble to the EU ‘Marine Strategy Framework Directive’ (2008/56/EC) notes (in para 42) the serious environmental concerns, in particular those due to climate change, relating to the Arctic waters which need to be assessed by the Community institutions and may require action to ensure the environmental protection of the Arctic.

Annex 1. The UK’s strategic position at the junction of several migratory flyways extending from the Arctic to temperate Europe and Africa as illustrated by an example showing the breeding grounds and migration routes of the waders that visit UK estuaries (closed circles below indicate species or populations that winter in the UK and open circles those that pass through the UK).

<table>
<thead>
<tr>
<th>Species</th>
<th>A NE Canada</th>
<th>B Greenland</th>
<th>C Iceland</th>
<th>D Britain &amp; Ireland</th>
<th>E Northern Europe</th>
<th>F Northern Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Knot</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanderling</td>
<td>○</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Grey Plover</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Turnstone</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Bar-tailed Godwit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Ringed Plover</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Whimbrel</td>
<td></td>
<td>○</td>
<td>○</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dunlin</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td></td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Redshank</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-tailed Godwit</td>
<td></td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oystercatcher</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Curlew</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>
Annex 2. Numbers of species of Arctic birds which regularly occur in the UK in significant numbers.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number of species of Arctic birds occurring in the UK</th>
<th>Example species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divers &amp; grebes</td>
<td>3</td>
<td>Great Northern Diver</td>
</tr>
<tr>
<td>Fulmars, petrels &amp; cormorants</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Swans</td>
<td>2</td>
<td>Bewick’s Swans</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whooper Swans</td>
</tr>
<tr>
<td>Geese</td>
<td>6</td>
<td>Greenland White-fronted Geese</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barnacle Geese</td>
</tr>
<tr>
<td>Ducks</td>
<td>14</td>
<td>Long-tailed Duck</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Common Scoter</td>
</tr>
<tr>
<td>Raptors</td>
<td>1</td>
<td>Merlin</td>
</tr>
<tr>
<td>Waders</td>
<td>27</td>
<td>Red Knot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sanderling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ringed Plover</td>
</tr>
<tr>
<td>Skuas, gulls &amp; terns</td>
<td>13</td>
<td>Glaucous Gull</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arctic Skua</td>
</tr>
<tr>
<td>Auks</td>
<td>3</td>
<td>Razorbill</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guillemot</td>
</tr>
<tr>
<td>Passerines</td>
<td>9</td>
<td>Snow Bunting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheatear</td>
</tr>
</tbody>
</table>
Annex 3. The world range of the Greenland white-fronted goose: an example of an Arctic breeding bird, responsibility for whose conservation is shared between four Range States. The UK supports about half the world population in the non-breeding season.
Annex 4. Designated sites of international importance for Greenland White-fronted Geese in the UK and population trends at these sites since legal designation. Data from Greenland White-fronted Goose Study annual reports.

<table>
<thead>
<tr>
<th>Ramsar Site</th>
<th>SPA</th>
<th>At designation</th>
<th>Current status (March 2012)</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caithness Lochs</td>
<td>✓</td>
<td>✓</td>
<td>440</td>
<td>338</td>
</tr>
<tr>
<td>Coll</td>
<td>✓</td>
<td>✓</td>
<td>789</td>
<td>50</td>
</tr>
<tr>
<td>Dyfi Estuary</td>
<td>✓</td>
<td>✓</td>
<td>139</td>
<td>48</td>
</tr>
<tr>
<td>Eilean na Muicke Duibhe/Duich Moss, Islay</td>
<td>✓</td>
<td>✓</td>
<td>600</td>
<td>223</td>
</tr>
<tr>
<td>Gruinart Flats, Islay</td>
<td>✓</td>
<td>✓</td>
<td>1,000</td>
<td>414</td>
</tr>
<tr>
<td>Kintyre Goose Roosts</td>
<td>✓</td>
<td>✓</td>
<td>2,323</td>
<td>2,350</td>
</tr>
<tr>
<td>Laggan, Islay</td>
<td>✓</td>
<td></td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Loch of Inch and Torrs Warren</td>
<td>✓</td>
<td>✓</td>
<td>534</td>
<td>244</td>
</tr>
<tr>
<td>Loch Ken and River Dee Marshes</td>
<td>✓</td>
<td>✓</td>
<td>350</td>
<td>173</td>
</tr>
<tr>
<td>Loch Lomond</td>
<td>✓</td>
<td>✓</td>
<td>221</td>
<td>152</td>
</tr>
<tr>
<td>Rinns of Islay</td>
<td>✓</td>
<td>✓</td>
<td>1,600</td>
<td>868</td>
</tr>
<tr>
<td>Sleibhteana agus Cladach Thiriodh (Tiree Wetlands and Coast)</td>
<td>✓</td>
<td>✓</td>
<td>1,419</td>
<td>948</td>
</tr>
</tbody>
</table>

November 2014
Rear Admiral Tom Karsten RN, Roderick Johnson, and Dr Richard Wood – Oral evidence (QQ 214 – 225)

Transcript to be found under Roderick Johnson
Ilan Kelman – Written evidence (ARC0051)

From Ilan Kelman (University College London and Norwegian Institute of International Affairs) submitted in my personal capacity as a researcher working on Arctic issues.

1. Two key reports helping to inform this submission are:

2. To ensure indigenous perspectives, it is important to invite directly indigenous representatives to provide their views, knowledge, and wisdom themselves in their own way, without it being filtered through people like me. Asking indigenous representatives how they would wish to represent their own views would be the best way forward. One example of fully involving multiple indigenous perspectives was at the International Experts Meeting on “Climate Change and Arctic Sustainable Development: scientific, social, cultural and educational challenges” held from 3-6 March 2009 in Monaco http://portal.unesco.org/science/en/ev.php-URL_ID=7461&URL_DO=DO_TOPIC&URL_SECTION=201.html Involving UNESCO and Prince Albert in such discussions would assist in promoting indigenous views.

3. One programme with leadership from indigenous Arctic peoples is Many Strong Voices http://www.manystrongvoices.org which I co-direct with John Crump from GRID-Arendal in Norway. The programme’s goal is “to promote the well-being, security, and sustainability of coastal communities in the Arctic and Small Island Developing States (SIDS) by bringing these regions together to take action on climate change mitigation and adaptation, and to tell their stories to the world”.

4. To fully understand the policy implications of Arctic issues, more basic research should be funded, including physical science, social science, and the humanities, especially work bringing together all these fields. An initiative conducting such research is the Stanford-based Millennium Alliance for Humanity and the Biosphere (MAHB) http://mahb.stanford.edu the mission of which is to: “Foster, fuel and inspire a global dialogue on the interconnectedness of activities causing environmental degradation and social inequity” and “Create and implement strategies for shifting human cultures and institutions towards sustainable practices and an equitable and satisfying future.”

5. Examples of priority topics for research include:
   (i) Sea ice properties for shipping and infrastructure, including friction, physics, and dynamics.
   (ii) Arctic communities dealing with change, such as work done by Many Strong Voices.
(iii) Corporate responsibility and sustainability for Arctic resource extraction, including involvement of the peoples affected, with examples being Arctic petroleum exploration and extraction [http://www.csroil.org](http://www.csroil.org) and resilience of tourism businesses [http://www.arctic-alpine-resilience.net](http://www.arctic-alpine-resilience.net)

(iv) Human and environmental health consequences of climate change in the Arctic.

(v) Improving operational human decision-making and behaviour in the context of Arctic decision-making, such as for shipping, resource extraction, and community involvement.

(vi) Projections and monitoring for Arctic shipping routes (the Northwest Passage, the Northern Sea Route (Northeast Passage), and cross-ocean routes.

(vii) Levels and consequences of ice pollution from river-borne heavy metals.

6. To support research, policy, and action, improved coordination and linking of observational networks is needed. Many observational networks exist in the Arctic, but they do not always seek consistent baselines; link environmental and social data; or combine external and local observations. That includes learning how to incorporate traditional, local, and indigenous knowledges into responses to climate change, especially at the national and regional levels.

7. Engagement of youth in the Arctic, both Arctic youth and non-Arctic youth, is needed. Arctic youth are a key constituency in dealing with environmental and social changes, particularly since they are the ones who will most have to live with the future and who will be sustaining Arctic communities. With the advent of new technologies and social media, engaging youth without losing traditional knowledge or their elders’ experience has challenges, but also opportunities, especially where non-Arctic youth become involved in the Arctic and could support Arctic youth in determining their own futures.

8. Communities, including indigenous peoples, are not necessarily against development of the Arctic region, including increased shipping, tourism, and resource extraction. Arctic peoples generally oppose decision-making about the Arctic without involving Arctic peoples and generally oppose Arctic activities which do not benefit Arctic communities and peoples on their own terms. To avoid such conflicts, any Arctic work should involve and be partly directed by Arctic peoples on their own terms.

9. Russia is a major challenge and opportunity in pan-Arctic initiatives, not just due to the current political situation but also due to language and cultural barriers. Non-Russian controlled or led initiatives often move forward without trying to understand Russian conditions, perspectives, limitations, and opportunities. Extensive effort is needed to fully involve Russia in Arctic activities, but the effort is worthwhile. The Saami and other indigenous peoples have extensive networks including Russia to share stories, opportunities, and solidarity. If indigenous peoples agree and subject to current politics, particularly to avoid putting any Russians at risk, these networks are an option for increased involvement of Russians in pan-Arctic initiatives.

10. Any Arctic policy initiative should include a component of education in Arctic schools and Arctic communities which should emphasise increased content on Arctic indigenous traditions. Such initiatives would be likely to increase the engagement of indigenous youth with their own cultures and communities. Arctic educational initiatives could also include
short courses given for temporary and permanent migrants into the Arctic about the Arctic, especially indigenous life and livelihoods. An existing mechanism which could be involved is the University of the Arctic [http://www.uarctic.org](http://www.uarctic.org).

11. Mechanisms for conflict resolution in the Arctic could be improved, especially in terms of addressing conflicts between traditional and new livelihoods to seek a balance and synergies, especially a balance amongst various livelihoods, all of which are affected by Arctic change. Existing mechanisms could be used more effectively for conflict resolution, and especially for addressing indigenous interests and coordinating monitoring and information, such as the Arctic Council, the Nordic Council of Ministers, the European Union, and Barents Sea networks.

12. Change in the Arctic is inevitable and few people and communities object to the principle of change. Change can and should bring advantages and opportunities, but it takes effort to ensure that occurs, rather than only disadvantages and difficulties resulting. To achieve what is needed, it is important to have Arctic research on Arctic communities and peoples by the communities and peoples themselves. That does not exclude others, but aims for collaboration with them—even if those outside the Arctic sometimes lead the work—so that research processes and outcomes support Arctic peoples on their own terms. Throughout these processes of change, the key is to be listening to Arctic voices, even when those voices give disparate messages. No community is homogenous and that includes the Arctic. But the Arctic peoples and communities still know what is best for themselves.

October 2014
Transcript to be found under HE Nicola Clase
1. Background of Involvement in Arctic Matters and qualification to assist Parliament

1.1. This is a submission following the House of Lords call for evidence dated 22 July 2014.

1.2. As a lawyer working in DWF LLP’s Marine Trade & Energy Group I have been heavily involved in Arctic Matters working closely with the London Insurance Market, the Marine Industry, the international Union of Marine Insurers, The Foreign & Commonwealth Office, UKTI’s Nordic-Baltic and Canadian team, a number of British Ambassadors in Arctic states, and a number of Arctic Governments; particularly Sweden and Canada. In particular I have worked closely with UKTI on two Arctic Conferences on the Sustainable development of the Arctic, one in London in March 2014 opened by Minister for Energy Michael Fallon, and one at the International Festival for Business in Liverpool in June 2014. I am, I feel, well positioned to be able to assist Parliament in answering a number of the questions raised about the role of the United Kingdom in the Arctic.

1.3. I am currently involved in linking the US Space Agency NASA and the US Naval Research Laboratory and the US National Oceanic Atmospheric Administration with the Lloyd’s of London Insurance Market with regard to their upcoming Satellite missions for the monitoring of ice to assist in the safe Navigation of the Arctic.

1.4. I am also working closely with the Foreign & Commonwealth Office in relation to the Arctic Circle Conference in Iceland at the end of October following the earlier work this year helping to identify British industry, science and technological interests that can help in the Arctic.

1.5. I am also working closely with the International Association of Classification Societies to include an ice regime in the Polar Code following the ice workshop I assisted The Swedish Polar Research Secretariat organise in conjunction with the Swedish Club, the Nordic Association of Marine Insurers and Lloyd’s of London in London in March, which involved the Secretary General of the IMO, Mr Koji Sekimizu.

1.6. There is much work ongoing and I am happy to update Parliament as things progress. Indeed on the day after this submission I am hosting a meeting at my firm’s headquarters, 20 Fenchurch Street, involving NASA, the US National Oceanic Administration, the Swedish Arctic Ambassador, the Canadian High Commission, the Foundation for Science & Technology, Lloyd’s of London, and other interests.

1.7. In order to understand more fully the background to this work before I answer the House’s specific questions I list at paragraph 2 my involvement in Arctic matters from Britain’s perspective recently which will be self explanatory and, I hope, helpful to the Committee. It will be noted when looking at the list that I have worked closely with Captain Anders Backman, the first Master of the Swedish Ice Breaker ODEN which was central to the Natural Environment Research Council’s 2004 ACEX (Arctic Coring Expedition) which, no doubt the Committee is aware, was a scientific coring (drilling for sediment cores) expedition to the Lomonosov Ridge close to the North Pole. The project was extremely significant for a number of reasons. ACEX was part of the International Ocean Drilling Program (IODP)
Michael Kingston DWF LLP, in conjunction with Åke Rohlén, President of Arctic Marine Solutions, and Captain Anders Backman, President Viking Ice Council – Written evidence (ARC0054) (iodp.org) and handled by Natural Environment Research Council (NERC) (http://www.nerc.ac.uk) as the European operator of IODP. NERC performed the work via the British Geological Survey (BGS) (http://www.bgs.ac.uk). BGS arranged the expedition and in turn contracted the Swedish Polar Research Secretariat (SPRS) (http://polar.se/en/) for the vessel and Ice Management part of the project. SPRS in turn contracted the polar icebreaker ODEN from the Swedish Maritime Administration and the nuclear icebreaker SOVIETSKIY SOYOUZ from Russia (then Murmansk Shipping Company – today Rosatomflot) as Ice Management vessels. As coring vessel the VIDAR VIKING (Swedish icebreaking AHTS vessels owned by TransViking Offshore – today Viking Supply Ships) was hired in. SPRS also provided an Ice Management team consisting of Ulf Hedman, Per Frejvall and Bertil Larsson. Captain Anders Backman’s role was Fleet Manager coordinating the operation of all vessels.

Today all these people are active in Arctic Marine Solution AB in Sweden (www.arcticmarinesolutions.se). The issue of Ice Risk Management was handled by AKAC Inc. in Canada. (www.akacinc.com).

1.8 ACEX was a landmark operation of vital importance for the understanding of the history of the Arctic. Through the cores retrieved one was able to examine 55 million years of history, shaping the way researchers look at the Arctic in a historic perspective.

1.9 ACEX is today the benchmark for all Arctic operations as it proved that it was possible to safely operate in heavy ice conditions (88.5N) provided there is enough resources of the right kind and that the knowledge on how to operate is well used through responsible well planned Ice Management.

1.10 The President of Arctic Marine Solutions is Åke Rohlén, who I have also worked closely with. Both Captain Backman and Åke Rohlén have made significant voluntary contributions to the promotion of safe operating standards in the Arctic and to the education of industry and the British Insurance industry. If I am called for further evidence I would encourage the committee to also request the presence of Åke Rohlén and Captain Backman who have authorised me to confirm they would be happy to assist, and can technically be considered party to this submission.

2. Involvement in Arctic matters from Britain’s perspective as a London lawyer.

2.1 My work, in conjunction with those who I have referred to has involved:
(a) 12.02.2012 Legal advisor to Lloyd’s of London’s Arctic Report.
(b) 21.03.2013 Legal advisor Lloyd’s Wreck Removal Report (including reference to the Arctic);
(c) 08.04.2013 Drafting and initiating Consultation regarding Arctic Marine Best Practice Declaration (the “Declaration”) with Åke Rohlén, President, Arctic Marine Solutions and Captain Anders Backman (www.iumi.com)
(d) 18.04.2013 Highlighting Declaration at Arctic Council SDWG Discussion, Stockholm.
(e) 09.05.2013 Moderating UK TI’s Arctic Discussion - Nordic- Baltic Conference, Mansion House, London;
(f) 15.05.2013 Attending Kiruna, Sweden for Arctic Council Summit;
(g) 06.06.2013 Assisting Lloyd’s in Wreck Removal Conference, Oslo, Norway;
(h) 13.09.2013 Presenting Lloyd’s Wreck Removal Report to industry, Singapore(including reference to the Arctic);
Michael Kingston DWF LLP, in conjunction with Åke Rohlén, President of Arctic Marine Solutions, and Captain Anders Backman, President Viking Ice Council – Written evidence (ARC0054)

Declaration (www.iumi.com and http://www.allaboutshipping.co.uk/2013/09/26/hot-topic.shipping-sails.into.troubled.waters.as.the.arctic.ice.melts/);

(j) 01.10.2013 Leading discussion- ‘Insurance for Ice voyages’ -North American Arctic Conference, St John’s Canada, including detailed discussions with Canada’s Senior Arctic Ambassador, Transport Canada, and the Canadian Ice Service;

(k) 29.10.2013 participating in British Government led ‘Poles Apart’ Conference;

(l) 14.01.2014 Leading delegation of insurance, research and marine industry leaders in discussion regarding the Arctic with Canadian Minister for Transport – London;

(m) 13.02.2014 Attending Cambridge University – request by Head of Arctic Ocean Geopolitics Programme, Scott Polar Research Institute re ‘insurance in Arctic operations’;


(o) 11.03.2014 Panel member/organiser - conference with Ake Rohlen, Captain Anders Backman, Swedish Ministry of Foreign Affairs and Nordic Council re ‘Sustainable Shipping in Arctic’, London; (with Arctic Ambassadors and IMO Secretary General) (http://www.polar.se/en/articles/conference-report-sustainable-arctic-shipping-and-marine-operations);


(q) 18.03.2014 Speaker / organiser UKTI’s Arctic Mining Conference, London;

(r) 08.04.2014 Panel participant/ leader - discussion ‘Insurance for Ice voyages’ ‘Helsinki Arctic Conference;

(s) 14.04.2014 Chairman at CII Arctic lecture, Lloyd’s, - David Vaughan - British Antarctic Survey;

(t) 20.05.2014 Presentation - European Maritime Day -‘Safety and Security’ - Requested by Commissioner for Maritime Affairs and Fisheries to help formulate European policy (http://ec.europa.eu/maritimeaffairs/maritimeday/en/programme-items/thematic-session-3);

(u) 21.05.2014 Assisting Lloyd’s to organise conference - British Embassy, Oslo – ‘closing knowledge gap on drilling issues- Barents Sea’;

(v) 10.06.2014 Organiser - Arctic Conference (DWF / UKTI) at International Festival for Business, Liverpool- highlighting regulatory issues, and assisting British Industry to liaise with Arctic operators; and assisting Arctic Countries promote inward investment.

(w) 18.08.2014 Presenting at NASA’s John C Stennis Space Centre, Mississippi at request of US Navy and NASA to enable their upcoming satellite missions to work with the London Insurance industry and Operators to assist in improved monitoring of ice.

(x) 15.09.2014 Presenting at the Arctic Exchange in Stockholm on best practice and the development of an ice regime for safe navigation.

(y) 30.09.2014 Organising meeting DWF 20 Fenchurch Street, involving NASA, the US National Oceanic Administration, the Swedish Arctic Ambassador, the Canadian High Commission, the Foundation for Science & Technology, Lloyd’s of London, and other
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interests to discuss best practice and NASA’s upcoming satellite missions for the monitoring of ice which it is hoped will assist in better ice prediction and ice navigation.

30.10.2014 Assisting the Foreign & Commonwealth Office to maximise British representation at the Arctic Circle business forum in Iceland.

3. Impact of above involvement from a British perspective

3.1. This effort has resulted in:

3.1.1 Significant media coverage helping to highlight the issues of concern regarding best practice (http://www.dwf.co.uk/people/michael-kingston);

3.1.2 The International Union of Marine Insurers backing the Arctic Marine Best Practice Declaration, as referred to at 2.1 (c) herein;

3.1.3 Recognition of ice regime being fundamental for the Polar Code - discussed formally in recent IMO session MSC93;

3.1.4 An international integrated approach/ closure of the knowledge gap regarding Arctic operations;

3.1.5 A recognition of the importance of British interests in Arctic operations; and

3.1.6 The importance of industry taking the lead in order to assist Government to maximise British influence in the Arctic.

4 Comments regarding the House of Lords Questions

In answering the questions set out by the Committee I will repeat the questions and make comments thereunder.

3.2. Question 1: What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?

3.2.1. I am assuming the Committee is referring to environmental changes. There are of course political matters that are currently at play, with the recent sanctions against certain Russian entities. Clearly these sanctions have a bearing on the development of certain operations in the Arctic and the outcome remains to be seen. What is important to point out is that the Arctic Council has worked very well as a consensus body for the welfare of the Arctic, those involved working very hard together to achieve collective cross-jurisdictional aims particularly regarding the environment in the Arctic, not least the British team as an Observing Member. I submit that it should therefore be Britain’s aim to ensure that the Arctic Council is in no way damaged by any recent or future sanctions and if possible that the Arctic Council does no get embroiled in the mainstream political thoroughfare of the day. Clearly that is a delicate path to travel but the aim is important, because, as a body, the Arctic Council is almost a model of international diplomacy.

3.2.2. In relation to the environmental changes it is clear that there has been record ice melt, coupled with record transits of the Northern Sea Route and the historic transit of the North West Passage this time last year. Additionally there has been increased destinational shipping including exploration activity - onshore (mining), offshore exploration and
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production, and cruise line activity. This is not just down to ice melt but incredible advances in technology; the power of ships to break ice and withstand low temperatures.

3.2.3. Much of the developments will involve British technology, science, insurance, finance, and legal services. I will expand on this in answering question 2 at 4.3 below.

3.2.4. One very important issue that could well be a consequence of the changing ice balance in the Arctic is the meteorological affect it may be having at lower latitudes. In the extended period of storms encountered in the UK and Ireland and other areas of Western Europe late last year and early this year there is a possibility that this was caused by the regulation of the gulf stream being slightly altered. It keeps our shores and temperatures warm and moist allowing for our extraordinarily warm winters on this latitude. However once hitting our shores it heads to the Arctic where it is then returned down the Western Atlantic once transiting the Arctic. Change in the Arctic is inevitably having an affect on the flow of the Gulf Stream. This in turn could well be affecting the meteorological balance. Whilst I am not a scientist, this needs to be monitored very carefully, and what happens in the Arctic needs to be monitored very carefully by the UK because of the critical importance of the Arctic in regulating the Gulf Stream which is fundamental to our climate.

3.3. Question 2: Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?

3.3.1. Much of the developments will involve British technology, science, insurance, finance, and legal services.

3.3.2. I refer to Annex A [not reproduced] at page 12 where a detailed report can be found on this issue which I prepared for for UKTI following the Arctic Discussion I moderated at the Nordic – Baltic Conference on 09 May 2013 involving Dr Dougal Goodman – CEO Foundation for Science & Technology, Johanna Salvolainen – Head of UK TI, Finland, Christopher Welch, Chairman of Association of Mining Analysts, Dr Stuart McCracken, Anglo American, British Ambassador Paul Johnston (Sweden), British Ambassador Matthew Lodge (Finland), British Ambassador Vivien Life (Denmark), and Cristiana Liaos, Nordic- Baltic Director, UK Trade & Investment.

3.3.3. I have organised two significant Conferences with UKTI this year as referred to at 1.2, 2.1(q) and 2.1(v) above which highlighted the opportunities. Specifically in relation to Insurance, finance, and legal service, I attach at annex B [not reproduced], at page 17, my talk at the second conference in Liverpool and would invite the Committee to read it.

3.3.4. I am currently preparing a report from the 10th June Conference in Liverpool and would be happy to provide the Committee with a copy when it is finalised.

3.3.5. The role of Government, of British business and other bodies should be to ensure that best practice is applied in all Arctic operations, that in doing so, responsible sustainable development should be promoted, and Government should help to put in place frameworks to encourage that, both domestically, and cross-jurisdictionally through the Arctic Council, and within the European Union.
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3.3.6. I refer in particular to the recommendations that were made to the Arctic Council following the seminar on best practice and workshop ice management referred to at 2.1(o) and 2.1(p) herein and are as follows:

- That the Arctic Council, or its working groups, is asked to assist in setting up a forum for the sharing of knowledge by industry, Government, the Research community and other parties in order to foster best practice.

- That under that proposed forum a specific group be set up to build an ice data regime across the Arctic to encourage each member state to take responsibility for their section of the Arctic in order to ensure best practice that goes beyond current regulatory requirements in areas where it is lacking. This is similar to initiatives already in motion in relation to charting.

- That under that forum the issues of crew competence and training be nurtured in a systematic and harmonised way in order to foster and support best practice - similar to training in relation to dynamic positioning such as that provided by the Nautical Institute.

- That the Arctic States come to some agreement about the monitoring of operations outside their Exclusive Economic Zone that constitute international waters.

- That such a forum represents a cross section of interests that make it fit for purpose – operators, insurers, and representative bodies such as the International Association of Classification Societies, with representatives from each member state.

- That such a forum includes a mechanism for sharing of experience in a way that does not compromise competitive advantage, or confidentiality.

- That these recommendations be raised if possible at the meeting of the Senior Arctic Ambassadors, including participation by Mr Koji Sekimizu, at Yellow Knife, Canada, 25-27 March

I would encourage the Committee to look at the reports containing these recommendations on the Swedish Polar Research Secretariat Website: http://www.polar.se/en/articles/conference-report-sustainable-arctic-shipping-and-marine-operations

3.3.7. From my experience in working with such a cross-section of those involved in Arctic matters in the United Kingdom I submit that an Arctic forum in the UK should be established to help foster an integrated approach consisting of similar domestic interests as referred to internationally in the reports at 4.2.6 herein.

3.3.8. It is a matter for the committee to consider whether similar submissions should be made to the European Commission in their current call for evidence regarding the Arctic.
Michael Kingston DWF LLP, in conjunction with Åke Rohlén, President of Arctic Marine Solutions, and Captain Anders Backman, President Viking Ice Council – Written evidence (ARC0054)

3.4. **Question 3**: How should economic developments be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?

4.3.1. The environment must take priority. In addition to the consequences of failing to protect the Arctic environment for those who live in the Arctic, the consequences are enormous too for our own environment (in particular for the reasons referred to at 4.1.4). Additionally, for the huge investments required to develop certain Arctic resources the damage to companies' reputation and their whole industry in getting it wrong are colossal. The Committee need look no further than the consequences for BP following the Deepwater Horizon disaster. The Arctic cannot afford a disaster. It is imperative that the United Kingdom promote best practice and help formulate regulation of the highest standards. At present appropriate systems are not in place because there is a significant knowledge gap. An integrated approach to gathering knowledge, best practice and the formation of regulation that is fit for purpose is required and in that regard I refer to the recommendations to Question 2 at 4.2.6.

3.5. **Question 4**: What are the human aspects of the expected climatic and economic changes in terms of local populations, current and future?

4.4.1. I am not an expert on the affect of environmental change on the indigenous people of the Arctic. I do understand some of the affects of shipping on mammals along the Bering Straight from ships transiting the Northern Sea Route, and from certain offshore operations. It is important that the operators liaise closely with those communities to take their concerns on board. It is also important to understand that the perception that the Indigenous communities are against investment and development is incorrect. It is welcomed if it is done in the right way. This was reflected in discussions I had with Mr Terry Audla, President of the Inuit Tapiriit Kanatami, the national organisation representing 55,000 Inuit indigenous peoples living in 53 communities across Canada in Stockholm on 15.09.2014. Mr Audla also commended the efforts of the London Insurance Market working with the International Union of Marine Insurers in their recent drive to promote best practice in the various initiatives as referred to at paragraph 2 herein.

3.6. **Question 5**: Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?

4.5.1. The simple answer to this question is No. Policy decisions about the pursuit of some resources can be made, but not the risks involved. Data is lacking, but the proposals suggested at 4.2 would go a long way to helping policy makers be more informed and to make considered decisions.

3.7. **Question 6**: Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?

4.6.1. I am not an expert in climate mitigation and adaptation strategies but again I would encourage the Committee to look at the recommendations for the recommended forums suggested at 4.2.6 and 4.2.7 herein which could address such issues which would form part of the ‘best practice’ procedure.
4.7. **Question 7:** Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

4.7.1. I am not a security expert. However I was requested by the European Commission for Maritime Affairs and Fisheries to attend European Maritime Day on 19.05.2014 as referred to at 2.1(t) herein when I presented on Safety and Security from the context of a lack of International regulation regarding best practice and safety. Best practice of course also involves industry working to the highest standards of security to secure operations. In supporting the initiatives surrounding best practice and the suggested forums that should be established both domestically and internationally at 4.2.6 and 4.2.7 herein the British Government would be putting their best foot forward in this regard, using the knowledge of industry and the other suggested participants to maximum advantage.

**Question 8:** How effectively does the UK interact with Arctic governance structures? Is the UK Government’s approach, as set out in the Arctic Policy Framework, proportionate and appropriate?

4.7.1. I have noted those responsible for Polar matters in the Foreign & Commonwealth, and Government Ambassadors interacting very well indeed with other Governance structures, particularly in the matters I have been involved in listed at paragraph 2 herein.

I refer again to the report at Annex A [not reproduced] (page 12) referred to at 2.1(e) and submit that the United Kingdom should encourage a bottom-up approach and capitalise on extensive expertise in science, technology, insurance, financial, legal, regulatory, marine and other fields in order to maximise British influence, which is important for the sustainable development of the Arctic. I again refer to the recommended forums suggested at paragraph 4.2.6 and 4.2.7 herein.

I hope that these submissions prove to be useful and am happy to assist the Committee further if required, as are Åke Rohlén of Arctic Marine Solutions, and Captain Anders Backman.

*September 2014*
1. **Supplementary Evidence regarding the Polar Code**

1.1. I am grateful to the Committee for asking me to submit further evidence in relation to the Polar Code.

1.2. This is a submission following a request made by the Committee dated 03.12.2014 following my attendance at Maritime Safety Committee 94 (MSC94) of the International Maritime Organisation (IMO) which took place in London on 17-21 November 2014 when the IMO Safety Committee agreed to adopt the Polar Code.

1.3. I have set out my background at paragraph 1 of my evidence dated 29.09.2014. Of particular note to the committee will be that I have been appointed as the representative (on a voluntary basis) for the International Union of Marine Insurers in the Correspondence Group that has been established to finalise an ‘ice regime methodology’ (the Methodology) that will now be a requirement under the Polar Code and included in its Guidelines. The Correspondence Group is scheduled to finalise the Methodology for IMO Maritime Safety Committee meeting 95 (MSC95) which takes place at IMO Head Quarters in London in June 2015. In order to facilitate the IMO’s preparatory process for MCS95 the Correspondence Group is scheduled to complete their report by 03 March 2015.

1.4. The Committee will have noted from my evidence of 29.09.2014 that I have been working closely with the International Association of Classification Societies to try and include an ice regime in the Polar Code following the ice workshop I assisted The Swedish Polar Research Secretariat organise in conjunction with the Swedish Club, the Nordic Association of Marine Insurers and Lloyd’s of London in March 2014, which involved the Secretary General of the IMO, Mr Koji Sekimizu. The concerns of the insurance industry were relayed by DWF and I in conjunction with Transport Canada to the IMO in an Arctic focus day on 28 February 2014 at IMO Headquarters where I explained the difficulty of analysing risk without an established Methodology.

1.4.1. Agreement in principle had been reached at that stage in the draft Polar Code on definitions for the different categories of ship and the requirements for safe operation in different ice types in Polar waters. All ships operating in Polar waters will require a Polar Ship Certificate and a Polar Waters Operation Manual, which is intended to give guidance for a range of planned and possible situations to determine the worst case scenario in the conditions that may occur. However insurers concerns were that this is only possible if there is an ice regime and guidance from a jurisdiction with that ice regime: then you know the extremes of ice that may occur and can plan for a worst-case scenario. Canada and Russia have ice regimes but in new areas of operation and in areas where temptation is opening up to the inexperienced - such as around Greenland - no ice regimes are in place. Therefore, without knowing the nature of a risk, shipping cannot plan for a worst-case scenario -as there was no ice regime system referenced in the proposed Polar Code. If some flag states with little experience approve Polar Water Operation Manuals and operators obtain their Polar Ship Certificate based on a lack of analysis.
of the risk because no ice regime is referenced then this is a recipe for disaster if such an incomplete analysis of risk were to slip through the insurance net.

1.4.2. Despite such a worrying scenario, behind the scenes a lot of hard work was being carried out to try and solve this problem to link the various elements coherently, tying together an ice regime and Ice Class, with industry best practice. Discussions at an influential conference in London in March organised (in conjunction with DWF and Lloyd’s) by the Swedish Ministry of Foreign affairs and Nordic Council, and the Swedish Polar Research Secretariat, involving leading insurers such as Lloyd’s, CEFOR, IUMI, the LMA, Allianz, RSA, Zurich, Hiscox, The Swedish Club, and Gard, with leading ice experts, and attended by IMO Secretary General Koji Sekimizu , and a further Ice Workshop in Lloyd’s Adam room, resulted in strong recommendations about an ice regime that were then made to the Arctic Council in time for its meeting with Mr Sekimizu in Yellowknife, Canada. The Seminar and Ice Workshop was also attended by members of the British IMO Delegation.

1.4.3. Following these discussions a Polar Operational Limitation Assessment Risk Indexing System (“POLARIS”) has been developed. At IMO Marine Safety Committee 93 in May, it was discussed informally. An informal technical working group was formed, led by the International Association of Classification Societies, with input from Arctic and Antarctic State delegates, and others.

1.4.4. The aim of POLARIS is to provide a standard approach for the evaluation of risks to the ship in the ice conditions expected to be encountered by providing a risk index in any geographical area that the ship is intending to travel. This is a system, similar to the established Canadian AIRS System, for other ice areas of the Arctic or Antarctic, and effectively creates a Polar ice regime, drawing also on the very experienced Finnish-Swedish Baltic system, and the Russian ‘Ice Passport’ system, with heavy input from those jurisdictions.

1.4.5. POLARIS uses a Risk Index Outcome (RIO) value to assess limitations for operation in ice. For each geographical area encountered the Risk Index Values (RV) assigned to the ship, based on the ice class, are used to determine a RIO that forms the basis of the decision to operate or limitation for operation. If the RIO is Zero or Positive the ship can proceed without speed limitation, if the RIO is between -1 and -10 the ship can proceed with speed limitation, such speed is calculated by POLARIS, and if the RIO is below -10 the ship cannot proceed. There are also provisions for ice areas broken by ice breakers, so ice breaker assistance is taken into account in the calculations.

1.5. At IMO MSC94 I participated in the Working Group on the Polar Code with the International Union of marine Insurers. The Report of the Working Group on the Polar Code and final Polar Code following adoption by the Maritime Safety Committee in Plenary session represents a significant result for the Insurance Industry, as the Polar Code now includes a Methodology for limitation of operation in ice that is a requirement in order to obtain a Polar Ship Certificate.
1.6. In particular it is now the case that in mandatory Part 1A of the Code it is necessary for operators to explain their 'methodology to assess operational capabilities and limitations in ice to the satisfaction of the Administration, taking into account guidelines to be developed by the organisation’. What this means is that an operator will have to show how they have prepared and will be able to operate in the extremities that can occur in the geographical area that they are intending to operate in by reference to an ice regime system methodology, be it the existing Canadian AIRS system, the Russian 'Ice Passport’ system, or alternative systems, such as the POLARIS system as explained in paragraph 1.4.

1.6.1. The reference to ‘guidelines to be developed by the organisation’ refers to a ‘Correspondence Group’ that is being established to ‘perfect’ POLARIS and other options as an alternative system to the already established systems- for use in the other areas of the Arctic and Antarctic (and in Canada & Russia if the Administrations are satisfied to allow alternative systems). It is in this Correspondence Group that I now represent the International Union of Marine Insurers as referred to at paragraph 3 above.

1.7. This is a significant result for underwriting risk analysis as it will establish clear benchmarked guidelines to enable underwriters to consider the risks being presented, and will assist operators to present risk in a manner that gives an explanation of what they are trying to do linked to a ‘methodology’ that everyone understands. Similarly it enables administrations to understand what it is the operator is intending to do more clearly.

1.8. Another issue discussed at length in the Working Group at MSC94 that is of importance to the insurance market and industry in general that the Committee should be aware of is the possibility in certain circumstances for administrations to waive the requirement for a physical survey when issuing a Polar Ship Certificate. Mandatory Part 1 A of the Polar Code now states: ‘For Category C cargo ships, if the result of the assessment in paragraph 1.5 is that no additional equipment or structural modification is required to comply with the Polar Code, the Polar Ship Certificate may be issued based upon documented verification that the ship complies with all relevant requirements of the Polar Code. In this case, for continued validity of the certificate, an on board survey should be undertaken at the next scheduled survey’.

1.8.1. This is important to understand as it will apply to Category C cargo vessels that are not ice strengthened which will be normal ships that may be spot chartered to make a trip through the Arctic in circumstances where the ice conditions are very favourable in the summer months – i.e. when there is little or no ice and no additional equipment in required to make the vessel fit for purpose. In such circumstances, following the assessment to ensure the ship complies with the Polar Code risk assessment guidelines and taking into account all the circumstances, the Administration may allow the issuance of a Certificate without survey, but such Certificate will only last until the next standard Safety of Life at Sea survey. This does not apply to passenger vessels.

1.8.2. It is also possible in certain circumstances (particularly thinking of the circumstances in the last paragraph) for an Ice Navigator to come on board and assist the Master,
rather that the entire crew having to be stringently trained which is the requirement for all other circumstances under the Polar Code.

1.8.3. These two exceptions are sensible and are good news for operators and underwriters which will result in already safe operations in such circumstances being able to continue where ordinary ships carrying out single one off voyages are spot chartered.

1.9. In the Correspondence Group’s work on the finalisation of POLARIS it is envisaged that a practical application of the POLARIS methodology will be carried out in the Antarctic and in the Arctic. The purpose of these trials is to perfect the system so that it can be effectively appended to the Polar Code, and so that it will be clearly understood by all concerned. Captain Juan Frias from the Argentinian delegation to the IMO is assisting in a practical application of the POLARIS methodology in the Antarctic which the Argentinians will co-ordinate in conjunction with the Correspondence Group. I have been asked to participate in that practical. It is the intention to carry out similar practicals in the Arctic. It is also noteworthy and indeed commendable that the Cruise Line International Association (CLIA) are also assisting with their vessels.

1.10. Whilst there is, of course, still more hard work to be done, these developments in the Polar Code in a short space of time demonstrate the importance of the British marine insurance industry in the Arctic, something that I highlighted at the Arctic Circle Conference in Reykjavik, Iceland in the British Government Delegation on 01.11.2014. The Methodology now included in the Polar Code owes a lot to the work of Robert Hindley, Lead Specialist – Arctic Technology, Lloyd’s Register, and Tom Boardley, Marine Director of Lloyd’s Register. Mr Hindley has conducted leading work for Lloyd’s Register on behalf of the International Association of Classification societies, and Mr Boardley’s support and understanding of the issues has been pivotal. Lloyd’s Register’s efforts are to be highly commended. It is noteworthy that Mr Boardley will be President of the UK Chamber of shipping in 2015 and was also part of the British Government Delegation to Iceland 30.10.2014 – 02.11.2014. I have no doubt that awareness of Arctic issues will feature on Mr Boardley’s agenda to highlight British Interests there.

December 2014
1. Elizabeth Kirk is the author of numerous articles on the production of normativity (i.e. how people/States come to view rules as binding) in both national and international law. She is currently researching governance in the Arctic. Her Arctic governance research has been supported by a Royal Society of Edinburgh/Caledonian Research Trust European Visiting Fellowship and through the employment of a Marie Curie Research Fellow, funded under the EU FP7.

2. Ms Kirk’s research focuses on the legal structures in place to aid Arctic marine governance and on the role of actors within those structures.

3. This submission focuses on question 7 of the call for evidence:

Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

4. This submission focuses first on the question of governance arrangements and in particular their ability to respond to anticipated challenges, then on the question of how the UK should support the Arctic states in their stewardship of the region.

5. There are three key aspects of the governance arrangements pertinent to this question:

Fragmentation in the governance arrangements

6. While there is an overarching treaty for the marine environment in the form of the 1982 United Nations Convention on the Law of the Sea (UNCLOS), the obligations in that treaty are framed quite broadly. Similarly, while there is an international organisation – the Arctic Council – which oversees many aspects of Arctic governance, that body has no authority to agree binding treaties or resolutions and it does not address all Arctic activities. For example, fisheries have been traditionally excluded from its remit. These overarching structures are supplemented by a variety of subject specific treaties, such as the 2001 Stockholm Convention on Persistent Organic Pollutants and a variety of sub-regional treaties, such as 1992 Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention).

7. This fragmented approach to governance could present a problem in terms of responding to anticipated challenges. Some issues are not fully addressed by a suitable governance system. For example, while a general framework for addressing fisheries in the high seas areas of the central Arctic Ocean when that area becomes ice-free exists in the form of UNCLOS and the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (Fish Stocks Agreement), these do not provide the detailed provisions that may be required for effective governance. Other issues, such as the protection of marine biodiversity, may be addressed under a number of overlapping, or competing regimes, from the 1992 Convention on Biological Diversity (CBD), to the Arctic Council’s soft law provisions, to regional fisheries agreements. There is then the possibility of competing, or contradictory provisions applying under these regimes. For example, while the CBD focuses upon conservation of biodiversity for its intrinsic worth, as well as to enable
its sustainable use, fisheries regimes focus upon securing the maximum sustainable yield of fisheries. The history of fisheries globally demonstrates that the goal of maximum sustainable yield has a negative impact on marine biodiversity.

8. These gaps and overlaps in the regime suggest that the current arrangements may not be able to guarantee an appropriate response to new uses of or threats to the Arctic. There are, however, also examples that demonstrate that Arctic actors are able to take steps to fill gaps. For example, the Arctic Council recently fostered the adoption of two new treaties – on search and rescue in the Arctic (2011) and Marine Oil Pollution Preparedness and Response in the Arctic (2013). These examples point to the fact that while the Council itself may be based on soft law, it operates as a forum to promote coordination amongst Arctic actors to address common problems. What is not clear, however, is the extent to which it is able to ensure that such action takes place.

Adaptive management in Arctic governance.

9. The examples in paragraph 8 suggest that the Arctic governance regimes are able to ensure change to existing norms or adoption of new ones. For such change to be guaranteed, however, decision making processes within Arctic regimes must be able to both receive new scientific, economic, political or other relevant information and review and revise existing decisions in light of that information. In other words the regimes must embrace adaptive management and many of them do. In particular, many have identified gaps in the data used in decision-making that needs to be and has been addressed. In an ideal system a discreet mechanism to identify gaps, would exist, but in Arctic regimes this tends not to be the case. Instead gaps are identified on an ad hoc basis: as working groups or committees address the tasks assigned to them, they identify where further data is required. The clearest example is provided by the Arctic Council which, for example, has moved to include community based monitoring to support the conservation of flora and fauna, so gathering new data and insights to feed into decision making.

10. There is, however, a weakness in much of the research being carried out to acquire new data across the Arctic governance regimes and that is that it is heavily reliant on reviews of existing literature and data gathered from individual States. It is likely therefore that decisions are being made on the basis of less than ideal data. Most organizations do, however, have scope to either conduct or commission new research and have done so at times.

11. Arctic regimes have also proved capable of developing legal norms in light of practice, or developments in understanding. The Arctic Council and Parties to the Biodiversity Convention, for example, adopted the ecosystem approach upon realising that existing approaches to conservation of biological diversity were not working.

Engagement with key stakeholders and the public

12. To be effective in responding to new challenges and new uses in the Arctic, the governance regimes must be able to engage with end users. That means, engaging with key stakeholders and with the public. In the Arctic, however, the governance regimes cannot guarantee effective engagement with these groups. In general
guaranteed rights for participation in decision-making are limited to certain States (members of the organisations.) Participation by non-member States and non-State actors tends to be rather limited. What rights there are tend to focus on the provision of information and consultation. In most cases the rights go no further than rights to be consulted on proposals even where such entities are permitted to attend meetings as observers. In addition all of the organisations limit attendance for non-member States and non-State actors – applying criteria to determine who may be able to attend. In only a small number of regimes, such as under the Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat, are non-member States and/or non-State actors expressly granted rights to propose activities for the organisation or to input into the agenda for meetings.

How the UK should support the Arctic states in their stewardship of the region.

13. One of the key contributions that the UK can and does make to stewardship of the Arctic is to promote and support excellence in scientific research, particularly in relation to the marine Arctic of which comparatively little is known.

14. The UK has already committed to supporting Arctic states in stewardship of the region through participation in and support for the work of the Arctic Council and other regional fora. While such participation will undoubtedly be of benefit, the UK’s role in these fora may at times be limited by the rules on participation. Additional locations for action should therefore, be sought. For example, the most significant threats to the Arctic arise as a result of climate change. The UK has also committed to promoting action through the UN Framework Convention on Climate Change to reduce greenhouse gas emissions and this could provide a fruitful means of supporting Arctic states in their stewardship of the region. Given the difficulties in achieving agreement over the continuation of or successor to the Kyoto Protocol to the UNFCCC it seems unlikely that focussing efforts on the UNFCCC alone will, however, provide significant support for stewardship of the region. Attention should, therefore, also be paid to other regimes, in particular those regimes focussed on single issues. For example, as Arctic sea-ice becomes less prevalent, shipping within Arctic waters will likely increase. The UK could work within the International Maritime Organisation to develop regulations, or treaties setting Arctic appropriate standards for shipping. Again, the UK has already committed to taking such action through its policy towards the Arctic. Similarly, the UK could work within the framework of the London Dumping Convention to ensure the adoption of Arctic specific regulations of offshore extractive industries.

15. As indicated in paragraph 14 the UK has already committed to taking the types of action necessary in the legal field to help support the Arctic states in their stewardship of the Arctic. The key issue then is to ensure that these commitments are delivered upon. It is suggested that priorities should be set for Arctic specific governance action, beginning with single issue activities such as those relevant to the offshore extractive industries and/or shipping in the Arctic.

September 2014
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

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Please note: During the meeting Dr Nalân Koç made references to presentation slides. This presentation can be found as written evidence submitted to the Committee. The slides have been numbered for ease of reference and their corresponding numbers have been inserted into the transcript.

Members present

Lord Teverson (Chairman)
Lord Addington
Viscount Hanworth
Lord Oxburgh
Lord Soley

Examination of Witnesses

Dr Jan-Gunnar Winther, Director, Norwegian Polar Institute, and Dr Nalân Koç, Research Director, Norwegian Polar Institute

Q81 The Chairman: I invite our first witness to speak.

Dr Jan-Gunnar Winther: I am Jan-Gunnar Winther. My educational background is in polar hydrology. I have a PhD from the Norwegian University of Science and Technology. I have worked for 20 years at the Polar Institute, first as a scientist and then gradually more and more in management. For the time being, I am an adviser to the Norwegian Government in the Antarctic Treaty Consultative Meeting and the Arctic Council. I was also lead author in relation to the last IPCC report and I am a member of a council in the World Economic Forum on the Arctic. Those are maybe the most important commitments that I have these days.

I will give you some background on what we do at the Institute but also on what is coming after me and in Svalbard for your delegation. Maybe the most interesting part of today’s
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

presentation will be Nalân Koç’s presentation on climate change. I have heard many voices round the table and I know that that will be interesting. I will start with the Polar Institute and some examples of what we do. I am happy for you to interrupt or stop me to ask me questions or make comments, so please do that.

The Polar Institute is not a huge institution. We have our main office here in Tromsø. We also have personnel in Longyearbyen and Ny-Ålesund in Svalbard, as well as a year-round station in Antarctica. The number of employees is around 165. We are what I often call a Polar Institute from A to Z, which means that we have our own logistical department that can equip any expedition on seas or on land at both poles. We have a library in the basement. We have a communications department and a research department, of which Nalân is in charge. We also have—and this makes us different from a university—an advisory role to the Government and we report to the Ministry of Climate and Environment. The ministry used to be called the Ministry of Environment, but the name was changed last fall to the Ministry of Climate and Environment. That may be a minor point, but it is not unimportant, as climate is becoming a central part of the former Ministry of Environment’s portfolio.

We have an ice-strengthened research vessel, tracked vehicles equipment and responsibilities in the Arctic and the Antarctic. Unlike the British Antarctic Survey, we have more activity in the Arctic, which makes sense due to where we are located—it accounts for about two-thirds of our budget, with one-third in Antarctica. Our budget is about £30 million a year. Those are rough numbers, but that is how it is divided.

Our task is to be the main, central body for scientific information about the Norwegian polar-regions, especially on issues related to the environment. We are technical and strategic advisers to the Norwegian authorities. We are part of the Norwegian Government
and report not only to our ministry, as I said, but to a wide variety of other ministries, with which we communicate on a weekly basis, not least the Ministry of Foreign Affairs, which is the clear number two in our communication with ministries.

As part of the Polar Institute A to Z, we also produce maps. If you go to the store in Longyearbyen and buy yourself a map of Svalbard, that map will have been published by personnel from the Polar Institute, who have been out doing the measurements in the field and have used satellite images if they were needed—they prepared everything that was needed before it was printed. We do that for Dronning Maud Land, which is about a sixth of Antarctica, where we have a claim—like the UK, Norway has a claim in Antarctica. We make both topographic and geological maps from the Arctic and Antarctica. We also deal with logistics, as I mentioned.

We have this thematic mandate, but we also have a well-defined geographical mandate. We talked about Svalbard, but our mandate also covers the surrounding ocean and the volcanic island Jan Mayen, which is located further south in the Atlantic than what we normally think of as the high Arctic. An area that has become more and more important for the energy nation of Norway is the Barents Sea. Our role in the development of the Barents Sea is connected to having knowledge about not only sea ice but oceans and ecosystems as well. These are can be national or international processes. A recent example is that this year there was the opening of what we call the Barents Sea south-east area—another area that has been opened up for oil and gas activity. We use the knowledge that we have to feed into these processes and give our advice. The advice to which the most attention was paid in Norway was connected to the sea-ice edge—it is not a line but a diffuse zone where open water meets sea ice. Our advice, which was taken by the Government, was not to drill closer
than 50 kilometres from the sea-ice edge. That is now a principle that is part of the guidelines and regulations that you have to follow as an oil company, for example.

The development in the Barents Sea has very much taken efforts from our activities in recent years. The Norwegian Government’s view on development in that area is to approach it in an overarching, integrated way. I have mentioned the energy sector, but the fisheries, tourism and shipping sectors are also taken into account in a balanced way. You can see a map of the Barents Sea, which shows lots of squares showing a preference that is given to certain activities in each of the different boxes. You might find areas where oil and gas activity is totally banned. You will find other areas that are open for such activity and some that are open for parts of the year, where the issue may not be sea ice but sea birds or other environmental factors. You have a shipping corridor, where you can have transportation, and you have especially vulnerable areas for spawning fish stocks and so on. The whole of the Barents Sea is like a patchwork.

**Dr Jan-Gunnar Winther:** A patchwork. The leading principle is that we want to work towards an integrated, sector-based and balanced way of having activity in the Barents Sea. No sector is number one here, in principle. You most likely know this, but while Norway’s income is connected to oil and gas, the fisheries sector is also very important. It is the clear number two. There are promising prospects, with an increase in the export value. Last year, we exported fish, both from aquaculture and from the open seas, worth NKR61 billion. That number is increasing.

That was a detour. Then we have the area over which we make a claim in the continent of Antarctica, with two other smaller islands within the Antarctic Treaty area. Bouvetøya is located between South Africa and Dronning Maud Land, at about 54 degrees south.
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

The Institute was moved up to Tromsø in 1998 and since then we have focused more on relations and collaborations with Russia. Let me stop for moment. I know that I am talking a lot, but you may interrupt me if there are things that you want to hear about. As I said, over the past 30 years, Russia was the nation with which we had the most collaboration. That is not the case today, but Russia is still one of the major nations with which we collaborate, particularly with the counterpart of the Norwegian Polar Institute, the Arctic and Antarctic Institute in St Petersburg.

We have a bi-polar approach; we work in both poles. From our perspective, the UK would gain a lot if its activity, which so far has been concentrated more to the south, for good reasons, was more balanced with the north. Norway and the Norwegian Polar Institute would welcome that.

**Q82 Lord Soley:** Sorry, could you explain that? Are you saying that the UK balance should move to the north?

**Dr Jan-Gunnar Winther:** This is my opinion. Given your location in the North Atlantic, like Norway, with a great interest for many reasons in changes in the Arctic, including the effects of climate change upon the UK, it is logical that a nation like the UK has knowledge collection in a region that is important for the country. I do not want to walk into domestic policy here, but a lot of the expense is related to activity in the south. You said “change” [in the Committee’s remit], and there is geopolitical change, business change and climate change—there are many changes going on. You are an observer to the Arctic Council, you are located where you are located and you are affected by climate change in the Arctic region. You have nice institutions that have a long record and are very well recognised; the British Antarctic Survey is one, and there are several others in UK universities. You have, as we have, a long record of good collaboration, particularly with other European—and maybe I should add
North American—countries. Germany is one of these; not only Germany, but Germany is important. It makes sense to have increased activity in the north. This is why the Ministry of Foreign Affairs recently produced this framework document: to look into that. I just wanted to put that view from our side. We welcome that very much. The one institution with which we have had the closest collaboration over the years is the British Antarctic Survey. It is probably not the only answer for Britain in the Arctic, but it is one answer to this potential increase. We would welcome that, and we would like to work with the British Antarctic Survey on developing it.

That is a nice thing for the UK and Norway. Because you have been leaning more heavily to the south and we have been leaning more heavily to the north, we are quite complementary in infrastructure capacity and the science. It is also a good starting point for the synergies of knowledge of one pole to be transferred to the other. We know very well now from nature that these things are connected. If you have a strong knowledge of, say, the Arctic, you can take advantage of that and transfer it to knowledge of the Antarctic. Britain and Norway fit very well together from that perspective.

Let us move on. I will speed up in some places. We have high ambitions for how to govern Svalbard. We know that there is a permanent Russian presence there, and there has been for a long time. There is also a permanent Polish presence, and now there is the Ny-Ålesund research village with a number of nations present, including the UK. We have very high environmental standards in Norway and would like that Svalbard is the best-managed wilderness in the world. This is an interesting footnote: Svalbard is clean, and we would say well managed, even though we still have coal mining there. There is a very interesting debate in Norway these days about phasing that out. Even the coal company in Longyearbyen has been thinking, quite recently, that there will be an end to this. We do not
know when it will end, but no one is arguing any longer that it should continue for ever. That is maybe something that you can pick up on when you are in Svalbard. It does not have a strong local footprint but of course has a global footprint. Going eastwards from Svalbard through the Russian group of islands, Franz Josef Land, there are enormous waste issues from the Second World War and the Cold War. Of supposedly 1 million barrels there, at least 100,000 barrels are filled with fuel and chemicals. There are wrecks of planes and ships. There are abandoned stations. It is a mess. The Russians have started to clean up, but it is a big job. That goes more or less for the whole stretch along the northern sea route, such as northern Siberia where there is so much abandoned equipment and waste from several decades. My point is that those islands are not very far apart. There is a strong gradient in the environmental dimension.

We also have duties in the south. We are the national authority when it comes to giving permissions for Norwegian activity in Antarctica. In addition to the science, Norway also has three businesses going on in the south. One is connected to cruise industry, Hurtigruten, and a coastal steamer that you may know of goes down south every year or so. Then we have a satellite receiving station—the Troll Satellite Station—for downloading satellite data. You will see the same company outside Longyearbyen on the mountain called Platåberget—I do not know whether you are visiting that. There is a satellite receiving station very close to Longyearbyen, and the same company that runs the Troll Satellite Station in Antarctica runs it.

Perhaps the industry with the brightest future is the krill fisheries, in which two Norwegian companies dominate and are, as far as I know, currently harvesting more krill than all the other nations combined. The volume of krill that is taken out from the South Atlantic is in the order of a few hundred thousand tonnes; our estimate is 300,000 tonnes. The estimates
of total stock of krill in the southern seas are not very good, but marine biologists say that there are maybe 300 million to 400 million tonnes. Keeping in mind that the richest marine food stock in Europe is found in the Barents Sea, where the quota of 1 million tonnes of cod was taken out last year, there are enormous marine living resources in the south that are still not utilised to the level of sustainable harvesting. This is a point of awareness. Many nations are active but still at a very low level. These krill products are used in aquaculture for feeding fish, and are now turning more and more to health products, such as krill oil. The latest thing I have read—I do not want to be named—is that they have found a positive correlation between krill oil and Alzheimer’s. If that is true, which I think it is, there is a potentially niche but very important market. At the very end, of course, krill can be used as food for human beings; that would be an important resource.

I have said that we do mapping. We are also doing research into oceans, sea ice, geology, geophysics—including atmospherics—and we have a separate group working on ecotoxicology. One of the latest areas of focus within the ecotox group is plastic. There is a growing understanding that we unfortunately have a huge environmental challenge in plastic in oceans worldwide, not just in the Arctic arena. About 100 million tonnes of waste has been quantified as floating around in the world’s oceans, and 60% to 80% of that is plastic products, from the very small microplastics to big ones such as a vessel from the tsunami in Japan, to take some examples. They are collected in gyres. We see these pictures of birds with nets around their neck and that is a quite dramatic illustration of this problem. Scientists say that about 15% of the plastic in the oceans is floating and 15% ends up on the beaches; we collect it just outside here and they collect it at Svalbard every summer. You are then left with 70 %, which is invisible to human eye. Probably the most dangerous thing is that it goes down into the water, and some of it is now found in microorganisms such as
plankton. We find it on the sea floor at depths of several hundred metres. We find it in the Barents Sea in crabs. We found it in nine out of 10 northern fulmars, which are small brothers or sisters of the albatross, in Svalbard last summer. Like many other things, such as climate change and ocean acidification, the Arctic is also affected by pollution, and in places it is particularly affected and damaged.

On biodiversity, we have studied ecosystems in the Arctic, from the polar bear at the top of the food chain to plankton at the bottom. Of course, the research is multidisciplinary and international. This is our research station in Ny-Ålesund, and this is the air monitoring station close to this station on that mountain. That is an important reference station for feeding into the world network of similar stations. We also have an office in Longyearbyen and equipment in the Svalbard Science Centre. In the south we have a small station with only six people overwintering. There are more people in summer, of course. There is also this building.

I think I have overrun my time already. This Fram Centre, as we call it, is a collaboration between 20 legally independent institutions in Norway. When we decided to make the high north the first priority in Norway, the Government also decided to build up academic capacity. The Fram Centre was launched, and I think it is fair to say that it is the number one initiative, when it comes to the academic sector, for investing in the high north, which the Government decided to do some years back.

There are now about 300 people in this building. But what is more important is that many of the institutions that are here have their main office in other places in Norway and their branches here. My institute is here with almost everything. We are the biggest one in the building, but we have institutions here that have more than 2,000 people but that have their
headquarters in other places. Fram Centre is relatively small, but it has a big base to tap into if needed. Social sciences, natural sciences and technology are included in this collaboration. I will leave it there. Of course, there is much more, but I would use your time and my time, so I will stop there and thank you for bearing with me.

**Q83 The Chairman:** That is an excellent explanation and background. Thank you very much indeed. A whole load of questions come up there. Do not think that we did not interrupt you because we were not interested; we are, but we have a whole package of questions to go through now.

We are going to make an official record of the meeting, but if there is anything in particular that you want to say to us that you would like to be off the record—we prefer things to be on the record—that you would not want up on our website or in the report at the end of the day, let us know and we can go off record.

**Dr Jan-Gunnar Winther:** That is quite easy to respond to. Everything that we say can be official. We are a governmental institution and part of the government structure, so everything that I have said and will continue to say, and Nalân is the same, is on the record.

**The Chairman:** That is fine. I sometimes give that facility, because people sometimes indicate that they would like to do that.

Dr Koç, would you like to introduce yourself?

**Dr Nalân Koç:** [Dr Koç began her presentation with Slide 1] As you can see, I have a very non-Norwegian name. That is because I was born in Turkey. I came to Norway nearly 30 years ago in 1985 and had my higher education at the University of Bergen, where I studied marine geology, paleoceanography—reconstruction of past ocean circulation, and climate. Then I moved to the Norwegian Polar Institute in 1999, after the whole institute had
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

relocated to Tromsø in 1998. I started as a researcher, was then section leader for the polar climate programme, and then became research director in 2011.

Today I will tell you a bit about climate change in the Arctic. A lot is happening, but within the time limits that we have I will focus on temperature and sea-ice change. I will start off by talking about CO₂ emissions. As you can see in this graph [Dr Koç moved on to Slide 2], since the 1990s our emissions from fossil fuels and cement have increased by 58%. So we are emitting a lot. This is the amount of CO₂ that is in the atmosphere [Dr Koç moved on to Slide 3]. We are also seeing that the annual mean growth of CO₂ in the atmosphere has increased from one part per million per year in the 1960s to two parts per million per year. That means that every year we are adding two more parts per million of CO₂ to the atmosphere. This is the latest figure from the internet [Dr Koç moved on to Slide 4] on the levels of global monthly mean CO₂, and we see that today we are in the order of 398 parts per million. Usually these numbers do not mean much to people who are not experts on this issue. What does 398 say to you? It is difficult. Therefore I want to show you what the natural values should be for a warm period like the Holocene, the period we are in, in order to understand the meaning of 398 parts per million today. In order to do that, we can use air bubbles from ice cores [Dr Koç moved on to Slide 5], especially from the Antarctic, to get a longer record—from the present back to 800,000 years ago, or for shorter intervals air bubbles from the Greenland ice core. When we look at the CO₂ concentration record from these ice cores we can see 100,000-year interglacial/glacial (cold period/warm) period fluctuations, and that during the ice ages the concentration values of CO₂ is around 180 ppm and that during the warm periods the peaks are about 280 ppm. This is the natural fluctuation of atmospheric CO₂ between the largest climate changes that the earth has experienced in the past 1 million years. The difference between the warm period and the ice age is 100 ppm. In the Arctic we
have already reached 400 ppm. Globally we are at about 398 ppm. This is 40% greater than the natural value of 280 ppm, which we should have had in the warm period. These figures are from the IPCC reports. This gives us a perspective on the amount of CO₂ that is present in the atmosphere today and which is a strong greenhouse gas. As we can see, the present level is 120 ppm more than the natural level, and as you can appreciate it is larger than the difference between an interglacial/glacial period, which is 100 ppm. It is a huge number.

This is the global temperature development since 1850 [Dr Koç moved on to Slide 6], for which we have instrumental measurements. This record shows us that there has also been a temperature increase in the past 100 years, but there is a special increase that we have been observing for the past three decades. This is the warmest period since 1850, but it is also most likely to be the warmest 30-year period for the past 1,400 years.

It is obvious from the studies [Dr Koç moved on to Slide 7] that this temperature increase of the past 30 years has been caused by our anthropogenic emissions. The warming is not homogenous [Dr Koç moved on to Slide 8] throughout the globe; we see that parts of the world are warming more than the rest, and we see that the Arctic is warming at almost twice the rate of the rest of the world, which we call the polar amplification. This is because of the special positive feedback processes that are taking place in the polar areas. This black line here [Dr Koç moved on to Slide 9] is the same instrumental record of global temperatures that I have shown you, and the blue one is the record for the Arctic. As we can see here, the temperature increase during the past 30 years is less than a degree for the rest of the globe but at least twice as much when it comes to the Arctic. If we look at the record for Svalbard, we can see very clearly the increase in temperatures in Svalbard during the past 50 years.

We have satellite images of the Arctic since the end of 1978 [Dr Koç moved on to Slide 10], which then gives us, during a 30-year period, a record for sea-ice areal/cover change. We are
seeing very clearly that there is a decline in the sea-ice extent during this period of about 14% per decade. We are also seeing that there is an increase in the decrease during the past seven to 10 years. Here you can see the two minimum sea-ice extent years of 2007 and 2012 sticking out. So the sea-ice area, from being about 7.5 million to 8 million square kilometres during summer—this is a September record for summer; September is the minimum summer extent—goes down to 4 million or 3.5 million square kilometres. As we can also see from these images from the early 1980s [Dr Koç moved on to Slide 11], summer sea-ice cover, which basically covers most of the Arctic Ocean, to the last minimum year of 2012, nearly half the ice cover has gone, leaving a dark ocean surface. I can show you the variability between different years [Dr Koç moved on to Slide 12]; these are the September records from 2007 and 2012 for the minimum sea-ice cover. We can see that during 2007, for the first time in a very long time, the north-west passage was open but the north-east was not, whereas in 2012 we witnessed both passages being open for sailing. This is the previous minimum in 2012 and this is September 2013 [Dr Koç moved on to Slide 13].

The areal coverage of the ice was larger in 2013 than in 2012; that is just to make a point that there is year-to-year variability in the climate system [Dr Koç skipped Slide 14 and moved on to Slide 15]. Therefore, when we talk about climate, we are talking about 30-year averages and trends and not year-to-year changes. It is not only the areal extent of the ice that is diminishing [Dr Koç moved on to Slide 15]; we are also seeing that the thickness of the ice is changing. From being multi-year ice growing up to five to six metres thick, we are now experiencing that most of the ice in the Arctic is first-year ice and, as such, has a thickness of 1.5 metres to two metres. These figures show that in the 1980s we had (in white) five-year-old ice covering most of the Arctic; as we proceed to the past three years, we have seen that the dominant ice in the Arctic is the (in blue) first-year ice. The older ice is
being concentrated in an area north of Greenland and the Canadian archipelago. There is a new Arctic emerging with dominantly thin first-year ice; which also tells us that the situation is more vulnerable since it is easier to melt first-year ice. If the conditions are favourable for ice-melting, in theory, most of this sea ice could melt within one season. But it does not necessarily mean that it will do so every single year—we saw an example of that from 2013 [Dr Koç moved on to Slide 16]. This figure illustrates the warm Atlantic water flowing into the Arctic Ocean; what is known as the Gulf stream/the Norwegian Atlantic current. This current is flowing along the western coast of Svalbard and then along the northern slope of Svalbard and into the Arctic Ocean. This is the main source of warmth to the Arctic Ocean. The Fram Strait, strait between Svalbard and Greenland is the main conduit of transport of sea ice and cold and fresh water masses southwards into the North Atlantic. In this strait we have an array of oceanographic moorings measuring sea ice drift and thickness, current speeds, ocean temperature, salinity and chemistry. The mooring array is a collaborative effort with the Alfred Wegener Institute, which has the moorings on the eastern part of the Fram Strait, focusing at the Atlantic water inflow, whereas the Norwegian Polar Institute has moorings on the western side focusing on the sea ice and polar water outflow. This area sums up/integrates what is happening in the whole Arctic Ocean [Dr Koç moved on to Slide 17]; we are seeing very clearly that there is a change in the modal thickness of the sea ice, declining from 3.2 metres in 2005 to 2 metres and less today. These results fit very well with the satellite images.

As I was saying, in the 1980s and 90s the Arctic Ocean was covered with thick ice of up to five or six metres [Dr Koç moved on to Slide 18]. Thick ice also has a rough surface. During the early summer, as the snow on top of the rough ice surface melts, meltwater ponds form, but, since it is a rough surface, they are concentrated small and deep ponds. In the case of
thin first-year ice, there is a much more level surface—so when it starts melting the
meltwater covers large areas forming huge ponds. The reflectivity of the white surface is
reduced with the dark spots (ponds) on the ice, escalating the warming in the Arctic. This is
one example of positive feedbacks, which are strengthening the global warming.

Of course, the million-dollar question is: when will the Arctic have an ice-free summer
season? The IPCC has shown that a nearly ice-free Arctic Ocean is expected before the mid-
century [Dr Koç moved on to Slide 19]. However, as I have shown you, if records continue to
show predominantly first-year ice in the area and the summer conditions are right, it can
happen at any time. However, as I said, that does not mean that it will be continuously sea-
ice-free year after year. There is a lot of variability in this system. We also have to remember
that because the IPCC report is a consensus report, it is conservative in what it is saying.

As I said, we now have a new Arctic Ocean [Dr Koç moved on to Slide 20]. It is very different
from the one we used to have, due to its reduced, thin sea-ice cover during the summer.
That changes a lot of the characteristics of how much is being reflected—the albedo—how
much heating is being transported into the ocean and the ecosystem—in short the energy
balance. Our models have been using algorithms for the old ice. During the 1990s there was
a large American-led programme, SHEBA, which took measurements that were fed into our
climate models. If we are to give a better and more precise prognosis for the future, we also
now need to have measurements from the new Arctic situation. In order to do that, the
Norwegian Polar Institute has decided to freeze its sea-ice-going vessel, Lance, into the ice
north of Svalbard during winter 2015 and let it drift with the ice until summer. During a
whole ice-freezing to ice-melting season, necessary measurements—physical, biological and
atmospheric—will be taken to contribute to the modelling world with more precise
algorithms. This project has both national and international participation, where scientists from the British Antarctic Survey will also be participating.

I was showing you that the conditions from the minimum in 2012 to 2013 were different. We had more sea ice left in 2013 and the same is also true for 2014. This year we also have quite a lot of sea ice, even though it is predominantly first-year ice, but the areal extent is large. I am now showing you two maps of the atmospheric situation—the pressure systems. I shall not go into details but other than that they illustrate that the atmospheric conditions were very different from one year to the next. In a world where we now have thin ice and lots of space for it to move around, the weather conditions, including the wind, have much more effect on the distribution of the sea ice than it had before, when the sea ice was much thicker and it was more difficult to move around it. In this new world of thin ice, it is also easier to affect the sea ice conditions. Therefore we are expecting a higher variability regarding the sea ice extent.

How does this affect our world? Until recent years, the EU was not very interested in supporting research in the Arctic because the Arctic was conceived to be far away and as such does not concern the Europeans much—it is at a distance. However, we now have this dark ocean opening up during the summer. Before, the summer sun rays were being reflected off this white sea ice and the water beneath it was isolated from the sun's rays. Now, the sea is in direct contact with the sun. As such, the surface of the Arctic Ocean is warming during the summer—it is absorbing the heat. During the autumn, as the atmosphere is cooling, that heat is being sent up into the atmosphere. Since 2005 we have a large heat anomaly—more than five degrees—in the atmosphere, especially on the Alaskan side. As such, we can say that we are already seeing
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

an atmospheric climate impact in early winter from the effect of low sea ice extent. That reduction of sea ice during the summer is heating our atmosphere during the autumn.

Our studies—and more and more studies are being done—are showing that [Dr Koç moved on to Slide 24], as the temperature gradient between the mid-latitudes and the Arctic is being reduced (because the Arctic is warming), the jet stream, which is fuelled by this contrast in temperature, is slowing down. We are also seeing that the wavy path of the jet stream is changing. It is getting wavier, with deeper troughs in the way it flows. It seems that the atmospheric is having an effect on the speed and track of the jet stream, which then causes changes in the distribution of temperature and precipitation patterns. We can surely say that the Arctic is influencing climate patterns well beyond the boundaries of the Arctic itself. It is having an impact on the whole northern hemisphere. We know that the changes in the Arctic have a teleconnection to the monsoon systems. Studies have been showing this connection regarding the monsoon in China and the weather systems in Japan and Korea. A new study in press also shows a connection between the Arctic and the monsoon system in India. So the whole northern hemisphere is being affected by the changes that are taking place in the Arctic.

This slowing down of the jet stream is also increasing the probability of extreme weather events, such as Hurricane Sandy in New York. These weather systems used to flow much faster. Now, they are being blocked and are staying over a region for longer periods, and therefore also causing more destruction.

As I said, single events are difficult to attribute to large climate changes but we are seeing more and more such events [Dr Koç moved on to Slide 25], such as the extreme winter in the US and Canada this year, with this tongue of cold air coming all the way down to the east coast of the US and sitting there for quite a long time. You also experienced some extreme
flooding events this winter in England. So of course there is a worry that it is not only that the frequency of these extreme events is increasing, or that they are becoming stronger, but the fact that, combined with these changes in the jet stream, they might cause more destruction than they have before because they are being blocked.

To wrap up, I have not gone into all the Arctic climate changes. There is a lot happening with the permafrost and fresh water in the Arctic also. This is just to tell you that we are expecting more extreme weather events. The permafrost is also thawing on land and in the oceans as the warming of the oceans increases. Methane is a product of this and it is 25 times more potent as a greenhouse gas than CO₂. There are also the issues of the increased sea level due to melting of ice sheets and glaciers and increased hydrologic cycles, but I also want make a point about surprises. Today the changes are happening faster than ever and this has become a new situation. As scientists, we are not up to date in understanding some important processes in the Arctic. So things are happening and we are going back and trying to understand what has happened. With the Arctic being a challenging area, in which to do science, logistically and resource-wise, we have more gaps in our understanding of the Arctic processes. I will end here by thanking you.

The Chairman: Thank you very much indeed. That brings it back home. I will ask one question. In the House of Lords we have a number of very strong climate sceptics. Are there people in Norway who say that none of this happening, or that it is not created by human intervention? Is there that stream of thought in Norway or not?

Dr Jan-Gunnar Winther: Yes, there is. As in most countries, of course, there is a small minority. It is a visible element in the climate change debate, yes.
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

**Q84 Viscount Hanworth:** It is noticeable that the climate sceptics in Westminster are changing their stance. Whereas they used to deny the reality of global warming, they are now saying that we can cope with it, that it is negligible and that it is well within our capacity to adapt. That is a substantial shift of emphasis. They will not admit that they have shifted their emphasis, but they have.

**Dr Jan-Gunnar Winther:** In that connection, we as an institution are leaning towards the IPCC. Our opinion is that we have overwhelming evidence of human induced climate change in addition to the natural variability. I will stop there.

**The Chairman:** Indeed. That was just a general question. Thank you both for those presentations. Perhaps we can now go through some of the things we are trying to nail down.

**Viscount Hanworth:** Can you remind me how far back your CO₂ records go?

**Dr Nalân Koç:** Eight hundred thousand years.

**Viscount Hanworth:** Is it worth speculating about things previous to that, such as the Permian period? Do we have any knowledge of what happened?

**Dr Nalân Koç:** Yes, we are. We know, of course, that there have been periods where the earth was much warmer than today and there was much more CO₂. That is in the geological history. However, both the orbital forcing and also the configuration of the continents were different before. They are not one-to-one analogues to what we are experiencing today. We did not have the Himalayas, the Antarctic had no circumpolar circulation around it. There are a number of different issues that change the whole equation.

**Lord Soley:** And the speed of change is the crucial factor.

**Viscount Hanworth:** May I ask another question?

**The Chairman:** I do not want to get too much into the history of climate change.
Viscount Hanworth: This is a contemporary issue. You said there was a major transfer of heat via the Atlantic or the Gulf Stream. Some 15 years ago there was a notion abroad that the Gulf Stream might turn off. Do you have a modern assessment of that possibility? I get the feeling that the possibilities are being discounted. Is that true? Can you inform us of current opinion?

Dr Nalân Koç: Do you know the latest?

Dr Jan-Gunnar Winther: Go ahead. I add more.

Dr Nalân Koç: It is a wind-driven circulation, so it is not easy to turn it off. However, you can cap it with fresh water. It would then be colder water.

Dr Jan-Gunnar Winther: The last bullet-point Nalân showed us was about surprises. I want to make one statement connected with that. We have consistently underestimated the rate of change in the Arctic. I am somewhat worried for future projections, but it is a fact that we have, in the past 10 years or so, consistently and severely underestimated the rate of change.

When it comes to changes and even regional cooling, there is one other issue in the scientific discussion, which you might know about, which is the freshwater accumulation in the Arctic Ocean due to melting. I can give the broad story, and perhaps Dr Koç can fill in. Due to the melting of the Greenland ice sheet and of the sea ice and increased discharge from rivers emptying themselves into the Arctic Ocean, there is an increasing volume of freshwater in the Arctic Ocean. From observations and measurements that we have, we know about quite substantial freshwater accumulation in the Arctic Ocean. We do not know if, how or when this will be released from the Arctic Ocean, but if that happens—most likely it will be released through the Fram Strait between Svalbard and Greenland—it would most likely affect the weather/climate in the North Atlantic. Such sudden cooling could have a
devastating effect on the Icelandic fisheries, for example. It could also affect Norway, the UK and a larger area. This is a discussion in the scientific community for the time being.

On the Gulf Stream and shutting it on and off, the climate model shows us that that is not likely to happen in the next 200 years. As far as I know, that is the knowledge on that issue.

Going back 15 years, a large programme between the UK and Norway called RAPID addressed exactly this: the instability of the Gulf Stream and sudden changes that could bring cooling to a warm region of the world in a global warming scenario.

_The Chairman:_ You are saying that, in the shorter term, freshwater could have quite a significant effect on ocean life in terms of fisheries and even down into—

_Dr Nalân Koç:_ And even the climate. It depends on how fast it is being released. It is a large body of freshwater sitting in the Beaufort Gyre. If it is released slowly—

_The Chairman:_ That is an important area that I do not think we have come across in noting the direct, relatively short-term, effect on something that the UK is involved in.

_Q86 Lord Addington:_ This is a question for both of you. What is the scientific and political value of being located here in Tromsø, as opposed to in Oslo? What is it about having a specialist unit here, as opposed to being part of the greater political centre? In the UK we are always told we are terribly London-centric and always fighting against that.

_Dr Jan-Gunnar Winther:_ On 9 June 1993 the Norwegian Parliament decided to move the Polar Institute to Tromsø. There were arguments on both sides: not least, Tromsø University wanted to have this centre of competence here. One of the arguments that proved to be mistaken in hindsight was that it was a disadvantage for the institute to be located outside the capital. I am not sure whether this is something that is easy to transfer to the UK, but for us we moved from being a very small fish in a big pond in Oslo having hasty one-hour meetings with the ministries, and now we are a big fish in a small pond. That means that
most people who want to go to the Norwegian part of the Arctic stop in Tromsø. Some of them go to Svalbard, like you. If they stop at Tromsø they will visit at least the university and the Norwegian Polar Institute. If they have more time they will cast their net even further. We now have closer contact with both national and international stakeholders than we probably would have had in Oslo.

There is a “but” to that story, which is that Nalân and I and a little group go to Oslo almost every week. It is still the capital; meetings still take place there. However, looking retrospectively at this, it has been a pro for the institute to be two hours away from Oslo. No one saw that in the early 1990s. This was before the high north became the issue that it is today. I often say that that decision in 1993 was wiser than they could have known at the time.

**Lord Addington:** Do you think that is primarily because of where you are geographically, or because you are a set institution away from the other bits of government?

**Dr Jan-Gunnar Winther:** Both, I would say.

**Lord Addington:** That is a lesson to us.

**Dr Jan-Gunnar Winther:** Very many go to the north. They do not only go to Tromsø. If they have a military interest they will go to Bodø, south of here, because it has some military capacity. If they are interested in oil and gas they will go to Hammerfest, which is close to the LNG plant on Melkøya. If they are interested in relations with Russia they will go to Kirkenes. Many go on study tours to the north and then they visit Tromsø. When the Norwegian Government prepares state visits and have more time after visiting Oslo, they very often go north and stop by here. That is why I would say that many dignitaries visit, because Norway would like to show the rest of the world the importance of the high north, which we believe is very important for all of us, including the UK. We have some competent
institutions located in the north also because they are working with the north as part of the
district policy in Norway. It can be an advantage being located north of Oslo.

**Lord Oxburgh:** Is it worth repeating what Nalân said to me at the beginning: that you have the university here?

**Dr Jan-Gunnar Winther:** The University changed its name recently from the University of Tromsø to the Arctic University of Norway. They broadened that to cover the Arctic, thematically. It is growing. There are some merging processes in the education system in Norway in general, but also in the north. The impact and influence of the university is growing; it is the biggest player in the university world in Norway when it comes to the Arctic. There is also the much smaller university in Longyearbyen, which is also dedicated to the specifics about the Arctic.

**Q87 Lord Soley:** You talked about the relationship with Russia. Can you give us examples of how helpful co-operation on the exchange of information and knowledge about what is happening in the Barents Sea is? Have the recent problems in Ukraine and so on made it more difficult, or are your scientific and other exchanges as good as they always were? I should add that I have a little concern about whether those agreements, which I would guess are quite good between you and your compatriots in Russia, translate into political action with Russia.

**Dr Jan-Gunnar Winther:** To the latter part of the question, I can say that at the institutional level—scientist to scientist or polar institute to polar institute—we have not been affected by the situation in Ukraine so far.

On the former part of the question, I had a question during our coffee break about what I meant when I said that our prime collaboration partner, looking over the last three decades, has been Russia. Russia and the former Soviet Union have been the most important
collaborator with us on the science over that period. If you were to take a snapshot of today, Russia is not number one. That is not a critical remark. Today, it is not Russia we collaborate with the most. That is not to discredit our relations with Russia, it is just a natural development. We had long, very good relations and co-operation with Russia, during the Cold War period as well. We have a very solid institutional, structural base, people and programmes. We have a small branch of the Norwegian Polar Institute in St Petersburg. We have educated Russian PhD students with Norwegian funds. We will have a science-led winter cruise with Lance in 2015, also with UK scientists participating. We also have Russian scientist in this project. There is a long, strong history of Norwegian-Russian collaboration in polar science.

**The Chairman:** Who is currently number one?

**Dr Jan-Gunnar Winther:** I should ask Nalân, but my guess would be Germany.

**Dr Nalân Koç:** Germany is definitely one of the countries that we collaborate with the most, but there is also the US. It changes with projects. We have several EU-funded research projects where we are collaborating with the UK.

**Q88 Lord Soley:** Can you give us examples of actual changes in policy that have come about as a result of your co-operation with Russia? I can see that the co-operation at times is very good. I just worry about the governance system and whether it translates into real changes on the ground.

**Dr Jan-Gunnar Winther:** I mentioned the integrated management plan for the Barents Sea. I did not mention that Russian specialists have also actively taken part in that process which is a management instrument for Norway. Because there is a border in the middle of the Barents Sea, which of course does not make sense in an ecological framework, we have invited Russian scientists within fishery and environmental management into that work.
Russians also have developed some of their own thinking related to this Norwegian integrated management concept.

**Lord Soley:** So the management of the environment of the Barents Sea is driven not just by Norway but very much by Russia? They are literally taking initiatives that work with you. Is that a fair assessment?

**Dr Jan-Gunnar Winther:** We have invited Russian specialists in so there is input from Russia and Russian expertise in that process. We have ended up with a Norwegian management tool covering around half of the Barents Sea. That has to be the case because there is a border in the middle of the Barents Sea, but of course the ecosystem crosses that border. We have very good relations with Russia, and I hope that lasts. The megatrend in polar science that has been introduced in recent years is the Asian countries: China, South Korea, Japan, India and, to some extent, Singapore. I think you will meet the Singaporean delegation while you are in Svalbard.

**The Chairman:** Yes, I met them in Canada and they said “We’ll see you in Svalbard”.

**Dr Jan-Gunnar Winther:** Yes. I would rank those countries in that order—maybe India and Japan could have switched places, I am not sure. Those countries have shown an interest and have stepped up their own scientific activity much faster than the relative increase in the UK, Germany, Norway and others. Those players were already active in the Arctic from the beginning. They were not starting from scratch. The level of increase from these nations has been very steep. That may be an exaggeration, but it is a large trend in the development in Arctic collaboration.

What is interesting, and where they can make a real contribution, not least within climate change, is that they are non-Arctic nations. I am talking not only about the A8 but about countries that are located very far away. As we heard from Nalân, when we have established
connections, they can make a real contribution in understanding how things are climatically connected. I hope they will use that domestic knowledge so that we can learn more about this interplay between the Arctic climate and the rest of the northern hemisphere.

**Lord Soley:** I am not thinking necessarily of Russia now, but can you tell us the contribution that your institute has made to any environmental changes in relation to Svalbard or Jan Mayen? Have you given advice that has changed environmental policy in those two areas? I am trying to get some hard examples of what changes when you give advice to the Norwegian Government, or whoever.

**Dr Jan-Gunnar Winther:** We are a technical and strategic adviser. The technical part is the science and the more advanced or strategic part is that we have the knowledge to keep an overview—and, of course, we feed into various processes. I mentioned the integrated management plan for the Barents Sea because that has clearly been the number one for the last five, or maybe seven, years at the Institute. There we have had a real impact on management, including most of the business development in this area. When it comes to Svalbard, there are national parks there and areas that have some kind of status when it comes to preservation and conservation. Of course ours is not the only voice but our voice is part of what has affected the final management regime in Svalbard. I think there are a number of examples of that.

**Q89 The Chairman:** One thing that our special adviser, Klaus, was bringing in was about defence forces and how information is co-ordinated. Do you co-ordinate with them, Mr Winther, in any way on these sorts of issues?
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

**Dr Jan-Gunnar Winther:** Let me put it this way. We are available for any part of the Norwegian governmental structure that would like to have information or advice. That includes many ministries.

**The Chairman:** Do they do their own research? Presumably they have data which they share.

**Dr Jan-Gunnar Winther:** I am not sure if I understand that question.

**The Chairman:** I know that this is going back, but a lot of the information about the Arctic comes from military sources because they do their own background research. I just wondered whether that was the case here or was significant. It may not be at all.

**Dr Jan-Gunnar Winther:** The military in all countries collect information on their own. I do not know what I do not know, so to speak, but speaking for my Institute we are available for the Norwegian Government, including the Ministry of Defence, when sharing knowledge, information and data.

**Q90 Lord Soley:** I want to move on to the growing interest in tourism in the Arctic, not least from the United Kingdom. There seem to be a large number of tourists coming out. Does the institute have a view about the sustainability of increased tourism, particularly from cruise ships, and about any search and rescue policies that may be necessary? If you bear in mind the disaster of the *Costa Concordia* in Italy, if that happened in the Arctic it would be a very different ballgame in terms of search and rescue. So first, is it sustainable if tourism opens up here in the way we anticipate, given what we are learning about the climate change issue here? Secondly, what about search and rescue if something goes seriously wrong with a cruise ship?

**Dr Jan-Gunnar Winther:** Maybe my answer will not be as specific as the question you raise but let me start with Arctic shipping, then zoom into the tourism part. In all our minds, the potential for a substantial increase in Arctic shipping—I am not talking now about cruise
tourism so much as transportation—is not only in transit or transportation between Asia and Europe, which is mostly what the newspapers cover, but due to the increased activity in that region we will also get increased activity that is not transiting between Europe and Asia. There has been a development. There is still a very limited volume but again, going back to the point about surprises, if Arctic sea ice continues to shrink in summertime, as it has done in the last years—it may be the case that it could even accelerate—then we will have an Arctic Ocean with a summer season that lasts longer and longer. In 2012, when the last transit went from Kirkenes in northern Norway with LNG to Japan, it left Hammerfest on 7 November. That was the last transit that summer—7 November—and it took about 14 days. What I am pointing to is that our societies have a bigger risk of underestimating this development than vice versa. Why do I say that? I think there is a smaller cost involved in being prepared for a quite significant increase in shipping than in not being prepared for it and in running after that development, which could be costly. So there is concern about shipping, including cruise tourism in the Arctic in ice-covered waters, for many reasons. The sea charts are poor; we know that from Svalbard, where we have good mapping on the west coast but not on the east coast. So the Governor of Svalbard does not allow the big cruise ships to sail up the eastern part of Svalbard. He does not permit them to do so.

Lord Soley: For safety reasons?

Dr Jan-Gunnar Winther: Yes, for safety reasons. You could also add the limitations there are on search and rescue, which are obvious although they have been improved. The capacity in Svalbard has recently been improved quite a lot. There is a new ship coming in and new helicopters are about to come. Nevertheless, there are huge distances. As part of the search and rescue agreement that was facilitated through the Arctic Council, Norway has an area of responsibility that goes over to the eastern and northern part of Greenland and over to
Franz Josef Land, as shown on the map. It goes to Russia in the east and all the way north, to the North Pole, which of course we cannot reach today with helicopters.

Then there is pollution, of course. Oil in ice is an area we are looking at in the Institute because of the potential impact of having an increasing volume of vessels in the Arctic today. Regardless of what they are doing, that is of concern. We have the experience from the “Exxon Valdez”: chemicals that enter the water and then go into the ecosystem have very long-lasting effects, much longer than we thought. There is no good way of removing oil from ice-covered waters today. The skimmers—the way we traditionally do it in open waters—are not working.

The Chairman: That is a really important point, and one that was also made to me by someone else. There is no technology that currently exists to deal with oil spills under ice. Is that what you are saying?

Dr Jan-Gunnar Winther: Well, today you can dissolve it by using dispersion means. Basically, when you wash your dishes you have soap; in principle, it is the same thing. You can dissolve it and get rid of it but it is going into the ecosystem—into the water, anyway. The other thing that has been experimented with is to burn it off using napalm, for example. You can burn it off but then quite a lot of pollution obviously goes into the atmosphere. That way of collecting up oil, as we are used to seeing it around the world when we have an accident, is not efficient at all. In a way, we have to force it into the ocean, dissolve it or burn it and bring it up to the atmosphere.

If I may put a last point, introduced species are also a concern, especially when you talk about transit between Asia and Europe. The North Pacific has a climate that is not that different from the Barents Sea and species that can follow a ship in ballast water or on its hull might actually introduce themselves into a different area. That is also of concern.
Q91 Viscount Hanworth: I suppose that part of Clive Soley’s question concerned the degree of leverage that scientists have over their respective Governments in terms of the implementation of their recommendations. I would like to ask, maybe allied to that question, about what you called the patchwork of regions where certain activities are regulated or restricted. The question is: who has mandated those restrictions or regulations, to what degree can they be enforced, and by whom?

Dr Jan-Gunnar Winther: They are formally anchored in the Norwegian Government. The integrated management plan for the Barents Sea had a steering committee that consisted of several ministries, chaired by the Ministry of the Environment. It was a governmental instrument. There is now a sailing corridor along the coast which is also implemented in the IMO. That was a trade-off between not being too close to the coastline so that if you had an accident you would not get oil on the shore, and not being too far away for the search and rescue dimension. Therefore it has been a trade-off. Now a corridor exists, with a northward lane and a southward lane—that is one example. The oil companies have to stick to this patchwork arrangement with its limited permissions for drilling; for example, they are restricted in certain parts of the year, and you have to adhere to that. Therefore that is reinforced, if I understood your question, and it is the Government of Norway who has made the rules about the management of that.

The Chairman: Can I just get clarification that they have covered the whole of the Norwegian EEZ. Is that the limitation?

Dr Jan-Gunnar Winther: We started in the north, so it covers the EEZ and also has 200 nautical miles around Svalbard.

The Chairman: That answers the question, thank you.
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

Dr Jan-Gunnar Winther: And now we are working our way south and implementing a similar management plan for the North Sea.

Viscount Hanworth: You also said that there was an artificial line drawn through the Barents Sea. What about the Russians’ interest in preserving these regulations and enforcing them?

Dr Jan-Gunnar Winther: They do not have a similar tool to ours in the eastern part of the Barents Sea. My observation is that Russia has had an improvement in its statements and actions in improving the environment. I mentioned Franz Josef Land, where there is lots of waste. When Medvedev visited Oslo, signing off the border in the Barents Sea, at the same time that he was in Oslo and a ceremony took place there, Putin was in Franz Josef Land. He stated—I remember very well, and we read it in the Russian domestic media—that, “We are going to clean up here and there will be money to do so”. That was back in 2010. I think it is fair to say that maybe not everyone thought that that would happen. However, the next year in the Russian state budget there was funding, and there has been real activity, and waste removal from Franz Josef Land.

Viscount Hanworth: There is a lot of nuclear waste there, is there not?

Dr Jan-Gunnar Winther: I am not sure about nuclear waste—I cannot answer that. However, there is a lot of nuclear waste if you go to the Kara Sea. The Russians have nuclear submarines there—especially on the east side of Nova Zemlya there is a lot of waste. I do not know about Franz Josef Land. However, the attitude in Russia as we see it is that there is more than words—there is also action, and wanting an improvement.

Viscount Hanworth: You mentioned that the approach is 50 kilometres from the margin of the ice, but of course that margin varies, so how is it defined more precisely?

Dr Jan-Gunnar Winther: That formulation of not closer than 50 kilometres from the observed ice—
Viscount Hanworth: From the observed maximum?

Dr Jan-Gunnar Winther: From the observed at any given time. Therefore you have to stop your operation. For example, if you start your test drilling in the Barents Sea if you are Statoil, and you are more than 50 kilometres from the ice, if the ice comes, you have to stop.

Viscount Hanworth: So it does not stop you from drilling somewhere where the margin shifts so as to bring you within the—

Dr Jan-Gunnar Winther: The ice edge is dependent on the time of year. It is not connected to the maximum.

Viscount Hanworth: So it is the current distance. Yes.

Q92 Lord Oxburgh: Perhaps we can talk a little bit about the science. It seems to me that the melting of the Arctic ice opens up a new scientific frontier in the sense that this area has previously been largely inaccessible, except to the very specialist organisations, and is now much more widely open. It is an area that we do not really understand in many important aspects. The Arctic and its processes do not understand about international boundaries—they cross them with impunity—so we have to view the Arctic system as a whole.

There are two aspects, one of which—certainly in the UK, and probably in Europe in general—is now much less well understood, or its importance is much less well recognised than it was 100 years ago. That is the importance of surveying, monitoring and data collection. In what is essentially a new frontier, that is extremely important—the necessity to do the kind of things that you are describing. By and large, universities do not do those things. However, there is a broad need for this monitoring and surveying, and of course a good example of that is the simple topographic surveying of the ocean floor. It is the same in the Antarctic, where there are real risks for cruise ships that go where the charting is not...
good enough. It is very easy for a ship to know where it is, but not to know the submarine
topography and where it is going to get caught.

Therefore my first question is: are you content with the present arrangements for both
topographic surveying underwater and the collection of other kinds of environmental data
that need to be done Arctic-wide? Universities will come into this and do the bits that look
interesting—the bits where they can understand processing. It is not that that is
unimportant, but at this stage the monitoring and surveying are absolutely crucial. I do not
know what your views are on that.

**Dr Nalân Koç:** In the Arctic, as in the Antarctic, the space is huge, and that is an international
factor. This is not something new; we have done it before, but as it becomes easier to access
the area and because a new situation climate-wise is taking place, there will also be a need
for even more and better co-ordination of efforts.

**Lord Oxburgh:** So how does that come about?

**Dr Nalân Koç:** On the co-ordination, there is a new task force, for example, in the Arctic
Council. That is hopefully a strong tool for that. Otherwise, collaboration usually happens
also through the availability of hard cash. Therefore, if countries are interested in solving
some common topics, they should allocate funds for their scientists to do that collaboration.
They have bilateral co-operation, but they could also co-operate on circum-Arctic larger
projects.

**Dr Jan-Gunnar Winther:** If you ask the scientific community, you will get a very positive
attitude to joining forces and data, and to establishing a common data centre. However,
your question is also highly relevant to talking to the commercial players. They have a
motivation that is maybe not so much in the direction of sharing information and data.
Therefore this is a very important part for business.
Lord Oxburgh: Is there any group in the Arctic Council—I guess it would be one of the working parties, or something like that—that tries to carry an oversight of what is being done Arctic-wide, that might say, “Look, there is an urgent need to collect this or that sort of data in this or that area”? In other words, is there any panoramic view of the need, and if so, who has it and who might do something about it?

Dr Jan-Gunnar Winther: The short answer is no.

Lord Oxburgh: That was my worry.

Dr Jan-Gunnar Winther: However, if you will allow me, I am not convinced that the Arctic Council is the right body to give guidance about where to work. In the Arctic Council you have scientists and science, but you also have a lot of non-science, so to speak. Therefore if that is the body that should direct science—

Lord Soley: Which is the right body?

Dr Jan-Gunnar Winther: I am not sure whether that body exists.

The Chairman: I met someone called David Hik.

Dr Jan-Gunnar Winther: Yes, from IASC, the International Arctic Science Committee. It has the same role in principle as SCAR in the south—the Scientific Committee on Antarctic Research. IASC is community-based, international, and widely topical, and covers the science for the Arctic. That body does not have money in its pocket. It can give advice based on a very effective international scientific consideration, but to implement its advice there has to be something more.

Q93 Lord Oxburgh: Apart from national Governments, the Arctic Council is the one body that could potentially have money and then ask a particular group or have a contract with it to collect particular sorts of information where it was needed.
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

**Dr Jan-Gunnar Winther:** I agree that the position is that the Arctic Council is, very wisely, the body that can show direction and capture the work done in the Arctic regions but such a body must also lean towards scientific bodies like IASC and others. It must be solidly based on advice from experts. At the top of the pyramid, so to speak, we see that the Arctic Council has a key role in this.

**Lord Oxburgh:** In terms of collecting monitoring information and a timed series of observations, any commercial organisation that does any kind of exploitation, oil or gas prospecting or anything like that could be required to make a series of environmental observations before it starts and to continue those observations during the time of its operations. Is anything of that kind required by the Government?

**Dr Jan-Gunnar Winther:** This is covered under national legislation. When Statoil performs its activities it is under national legislation, as with other companies. There is no reason to think that the Arctic Council needs to take over that. Maybe I misunderstood your question.

**Lord Oxburgh:** But who determines what Statoil should monitor and measure before, while and after it carries out an operation? Are you consulted over that? Who is?

**Dr Jan-Gunnar Winther:** It is within the Norwegian governmental structure. It depends on which matter. We are not the key institution in this kind of work. The Directorate of the Environment oversees and sets that, in some cases the Norwegian Petroleum Directorate.

**Lord Oxburgh:** That is within the ministry, is that right?

**Dr Jan-Gunnar Winther:** Yes, the Directorate of Environment is the sister organisation of the Norwegian Polar Institute, also under the Ministry of Climate and Environment, that gives the rules and also looks after things if there is, for example, a zero-release requirement. It adheres to the national rules and legislation.
Lord Oxburgh: How much work is going on to look at the effect of the melting of the ice on the biosystem, ecosystems, biodiversity within the Arctic Ocean and the changes in those systems? Those systems have to change in response to the new conditions.

Dr Nalân Koç: There is quite a lot of new work going on. Part of the work of our Centre for Ice, Climate and Ecosystems is geared towards that issue. The University of Tromsø and the Fram Centre here are also working on these issues. There is also international interest in this new topic.

Dr Jan-Gunnar Winther: The rate of change in the Arctic is very much connected to sea ice, as we have seen. The ecosystem changes are taking place at a phenomenal rate. We know that living here. We have seen it with our own eyes outside Tromsø or in Svalbard. Every year, there is migration of species and new species. There is a phenomenal response in the ecosystem to the physical changes but this has not received as much attention in the media as it should.

Viscount Hanworth: I understand that there is an unprecedented affliction of insects.

Dr Jan-Gunnar Winther: Yes. There are many things going on.

Lord Oxburgh: It is worth emphasising the point Nalân made. If you remember her early diagram of the rises and falls in CO₂ in the atmosphere over the past 800,000 years, you can see a frequency associated with these, a time constant every 30,000 or 50,000 years, or something like that. The difference is that the current rise in CO₂ is, geologically speaking, instantaneous. Whereas there has been time in the past for ecological systems to accommodate, species to migrate and what have you, we are into a totally new ball game here. We just do not know what is going to happen.

Dr Nalân Koç: Another issue that I have not mentioned is ocean acidification. One-third of our emissions are being absorbed by the ocean, so there is the ocean acidification problem.
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

The IPCC in its last report said that, due to global warming, natural agricultural land areas will diminish and we will look more and more to the oceans as a major source of food for the increasing population. However ocean acidification is a potential threat to our future food source.

**Viscount Hanworth:** Lord Oxburgh made the point about the gradualism of the previous climatological evolution but there is also a notion abroad that there have been tipping points that led to very rapid changes. Is there anything in the paleo-planetological record that shows a very rapid change and the consequence of passing a threshold?

**Dr Nalân Koç:** There have been rapid changes. However, as Lord Oxburgh points out, none of them is as rapid or has this magnitude. There are always small rapid changes but this magnitude of change is very large.

**Q94 The Chairman:** Can I just go back to basics on this research, as someone who has not been involved in this area at all? Clearly, you can do endless amounts of research on anything. You could spend the world’s GDP on research if you wanted to. Following on from Lord Oxburgh’s point about the seabed, are we anywhere near knowing what we need to know about the Arctic to meet the challenges before us? Are we 10% or 90% there? Is this a real crisis in terms of needing lots more research, or is there maybe a capacity constraint anyway—even if we had huge budgets, we would not have the staff to carry it out? I am trying to understand the scale of the challenge in the short to medium term for research. With everybody from the ocean states getting involved, are we getting to a point of coping with it or is this something that, as a globe, we really need to concentrate on far more?

**Dr Jan-Gunnar Winther:** Starting on the heuristic side, we could do with the UK’s GDP. The serious way to answer this is to look back in time and take the view that these areas—Antarctica in particular but also the Arctic—had not been investigated to a very great
degree, purely because of inaccessibility and there was not really much interest, few people living there and so on. That is as close as you can come to a fact: these have been under investigated compared to other areas of the world. Even though there has been a steep increase in investigations since then, this takes time. If you add the importance, which we understand more and more, that these areas have for their regions but also beyond the regions, my answer is that they are heavily under investigated. But it is hard to give you a figure: whether it should be doubled, tripled or tenfold. My argument would be that for societies—this is a valid argument for a nation such as the Republic of Korea, as an example—if you invest one penny in studying the Arctic, you gain more in improving your domestic management of your resources. Examples where climate teleconnections are important outside the region are the monsoon, flooding, drought and so on. There is a benefit from investing in Arctic research because you reduce costs in your domestic society. We are seeing what happened in the US and the cold breakout of air last winter there. The Washington Post had an insightful article on this. Of course, the debate in the media was, “Where is global warming? It was cold, windy and snowy. We are almost dying from this harsh winter and you speak about global warming”. The Washington Post ran a very insightful article with a few illustrations. One was that the cold outbreak of air from the Arctic was due to the reasons that Nalân explained: a weather phenomenon connected to the weakening of the circumarctic atmospheric circulation. Then it had this beautiful illustration of 30 years, or slightly more, of temperature over the US in the winter months. It took exactly the part of the year when this happened and showed the development in the past 30 years in the US. Then you could see that the US has warmed in the winter, the east coast more than the average, and the US more than the global average. There was a decadal increase in winter temperatures in the US of 0.64°C. The public discussing and mixing weather events from
climate trends had not really captured that: they said, “We cannot have global warming and at the same time this happens”. So this was a very strong illustration of the difference of climate and weather.

**The Chairman:** Say that by a miracle we managed to double the amount of research that was done next year. Can the scientific community deal with big increases, or do you need to have specialists like yourselves? Can you just draft in capacity to do scientific research or does it not work that way?

**Lord Oxburgh:** You cannot just talk about scientific research in that way.

**The Chairman:** That is exactly the point I am making.

**Dr Jan-Gunnar Winther:** I can use the Institute as an example. We have increased our research by 80%, if not 100%, over the past 10 years. We would manage to do that on such a scale not from one year to another but over a certain number of years. That is one institution and you could apply that to the whole scientific community. We are capable of absorbing this.

**Lord Oxburgh:** Would you agree that one sort of answer to Lord Teverson’s question is that there is an urgent need in the short term to establish the, if you like, environmental background: to do work on the topography, monitoring and measuring a series of levels against which in future changes can be measured? It is important to do this now before exploitation really takes off in a big way. I suspect that there would be quite a strong case for a surge over the next few years, maybe the next decade, after which things could die down a little bit. Does that seem a reasonable approach?

**Dr Jan-Gunnar Winther:** Yes, but I would not focus that in isolation and so much on the topography.

**Lord Oxburgh:** I was using that as an example.
Dr Nalân Koç and Dr Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

Dr Jan-Gunnar Winther: We have quite a good overall understanding of the atmosphere, the sea ice and the ocean in connection to climate change but it is not sufficient. I think we have reached a balance where the money spent on this activity is still paying off in the domestic manner in the UK and Norway. Topographic mapping on the sea floor is more of an interest for business activity that is a driver of climate change or natural sciences. I would not focus that much on that as, at the moment, the most critical need of knowledge.

Viscount Hanworth: One of us was advocating increasing greatly the scientific budget. One of the principal issues is trying to change the perceptions of politicians among the public in general regarding what scientists know to be a major hazard. Our experience in the House of Lords is germane to this issue. There are people who simply will not be convinced, and it perplexes some of us as to how well educated and rational people can maintain such opinions. That is really one of the principal issues. It may be that our report will make an important contribution. To me it seems to be one of the leading issues, because I have been engaged with this over a period of 25 years or so. I look back at some of my writings, and the question that was raised at the very start was: “How long will this take to sink in?” I am afraid that I have a very big report to deliver about this matter.

Dr Jan-Gunnar Winther: Of course, it is a very big paradox because in other parts of human behaviour we pay for insurance even though risks are much less certain than what we face in connection with climate change.

Q95 The Chairman: There are a couple of other areas that I want to cover. I come back to the climate change issue but in a micro sense. One of the things that our report wants to consider is whether there are policies specific to the Arctic that you feel ought to be pursued in terms of mitigation or adaptation. I am not talking about the big IPCC issues, but perhaps including black carbon. I do not know what else there might be, but are there things that can
be done regionally that help to mitigate, or with which we can prepare for adaptation to the effects of climate change? Can anything be done, or is it just a matter of covering emissions globally?

**Dr Jan-Gunnar Winther:** There is maybe a twofold answer to that. The answer to your question is yes but, given the fact that the Arctic is warming twice as fast as the globe, we know that what happens in the Arctic affects the rest of the world. So it is a strong showcase for climate change. Then we can add a layer of very good collaboration—let us take the Arctic Council as an example. That is a very good fundament for introducing very concrete action in this showroom, the Arctic, which arguably could be used as kind of an export for the globe. Black carbon is such an example. A heavy fuel ban for vessels would be an unrealistic ambition today, but we need ambitions beyond what is possible today. It is easier to implement this kind of future world reality—today they are almost unrealistic ambitions—in this showroom, the Arctic, to show that it can work and has an effect. Then it can be exported to the global arena. We could use a few of these interesting ambitions for the Arctic which might actually work.

**The Chairman:** And those are?

**Dr Jan-Gunnar Winther:** Black carbon is one. Heavy fuel is another. A change in the energy mix—there is a lot of gas in the Arctic region, and there could be all sorts of alternative energy sources to operate in communities. There is a relatively long list, including technology development on vessels. The most important thing would be that if you could show that it worked—for example, turning vessels operating in the Arctic to LNG instead of using heavy fuel—the industry would see that, and you could get momentum in research and development that could be activated on a broader scale. The strength of the Arctic, despite the depressingly rapid extent of climate change, is that it could be used as a showroom for
international co-operation, action, ambitions and real projects that could help us to move into the world that will have to look at things differently.

**Q96 Lord Addington:** What role do you think bodies such as the World Economic Forum could play in the Arctic region, given that the NPI is member of the forum’s Arctic group? Also, how good are you at getting out to talk to other people and say: “The Arctic is disappearing rapidly as an ice sheet. This actually means that there is an economic consequence”? There is clearly a disconnection at the moment, and this is what we are going on about. We have already mentioned that in Great Britain, if you started talking to someone and said: “By the way, global warming is why your insurance bill has doubled, and the house that you bought now can never be sold because part of it disappears every time there is a rainstorm”, that is the level at which we have to operate to make this important. It is what we call “nimbyism” in Great Britain—“Not in my back yard”. This is so strong in everything we do and in other forms of activity. How do you get out there? Any thoughts, because that is the big one?

**Dr Jan-Gunnar Winther:** That is a hard one. Maybe I am not the person to whom you should address your question directly, but in research done on how you change people’s opinion on matters it turns out that grown-ups, adults like ourselves, hardly change their opinions. You stick to your opinion, almost whatever you take in and read. So one part of the answer is the young people who are still absorbing information, and you have to have a long-term perspective. The issues that are at stake and which we are discussing today are well understood by world leaders. The issue of climate change, its complexity and severity, and what it could cost at the end of the day—

**Lord Addington:** Just to jump ahead, you are basically saying that we are on a short-term political cycle, which is determined by things such as elections, and that is getting in the way.
Viscount Hanworth: It is also denied by politicians—

Q97 The Chairman: I think this is getting into another area. I am going to wind up and thank you both very much indeed. Can I just ask one final question? If you were writing our report for us, what is the most important thing that you would include in our recommendations? Is there anything that you think: “This is the thing to say to the world in our report”?

Dr Jan-Gunnar Winther: It is important to have a good balance in all the issues relating to challenges and problems arising from what is going on in the Arctic. We have paid most attention to that in this meeting. The balance also applies to the opportunities that open up. There is no doubt that the future Arctic may contain a lot of opportunities that are not there today, but it is important to find the right balance that provides sustainable development. The Arctic—you mentioned World Economic Forum—is a part of the world in which many other nations would like to see increased development, income and activity. Then, on the other hand, we have the environment and potentially severe impacts of activity. This is absolutely not black and white. We need to find a balance. We often use shipping as an example. We often address the oil-spill issue. If there would not be any accidents related to Arctic shipping between Asia and Europe; that would be a good thing for the environment due to shorter distances and reduced CO2 emissions. It is not black and white. That is a very roundabout answer to your question but it is extremely important that we get these things right with a balance that is sustainable.

Dr Nalân Koç: I would re-emphasise the fact that what is happening in the Arctic has far-reaching consequences, and that needs to be understood by the societies living in Europe.

The Chairman: That is a very strong message to put at the very front of what we say. Some of the things that have come out today have emphasised that. I shall formally end this
session and say thank you very much indeed for giving us such a really good grounding in the whole area.
Climate change in the Arctic

Nalan Koc Research Director
Nalan.koc@npolar.no
Global fossil fuel and cement emissions: 9.7 ± 0.5 GtC in 2012, 58% over 1990

- Projection for 2013: 9.9 ± 0.5 GtC, 61% over 1990

$\text{CO}_2$ emissions (GtC/yr)

- 1990–1999: 1.0%/yr
- 2003–2012: 2.7%/yr
- 2011–2012: 2.2%
- 2012–2013: 2.1%

2013: 9.9 GtC

Uncertainty is ±5% for one standard deviation (IPCC “likely” range)

With leap year adjustment: 2012 growth rate is 1.9% and 2013 is 2.4%.

Source: Le Quéré et al. 2013; CDIAC Data; Global Carbon Project 2013
Atmospheric concentration of CO₂

annual mean growth rate of CO₂ at Mauna Loa

Slide 3
The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years.
Each of the last three decades has been successively warmer at the Earth’s surface than any preceding decade since 1850.

In the Northern Hemisphere, 1983–2012 was likely the warmest 30-year period of the last 1400 years (medium confidence).
Human influence on the climate system is clear.
Pattern of global warming
Last decade vs mean of 1900-2000

Polar amplification

Also accelerated warming at high altitudes

The Arctic is warming at almost twice the rate of the rest of the world

http://data.giss.nasa.gov
Svalbard

Slide 9
13.7% per decade decline in summer sea ice cover since 1979
A dark ocean taking over...
Summer sea ice cover 2007 vs 2012

This year’s minimum is 18% below 2007 and 49% below the 1979 to 2000 average.

4.17 million km$^2$  

3.41 million km$^2$

Slide 12
The Arctic sea ice cover reaches its minimum in September. The remaining ice is called the perennial ice cover. CryoSat determines variations in its thickness so total ice volume can be worked out.
Younger & thinner sea ice

Higher vulnerability

Slide 15
Arctic Ocean Outflow Observatory (AOBS)

IBCA-kart fra http://www.ngdc.noaa.gov/
Threshold value for an ice free summer season is
MY modal thickness = FY thicknesses = 1.5-2 m

(Hansen et al. 2013)
The heat is on

The rapid shrinking of summer sea ice in the Arctic is not just due to the change in albedo as ice gives way to water. Recent studies suggest several positive feedback factors are involved.

**Before**
- Snow consists of ice absorbs only about 10% of the sun’s energy per unit area, whereas the ice melts more heat.
- Snow cover blocks transfer of ocean heat to air causing warming.

**Now**
- Warmer air due to higher greenhouse gas levels is increasing the extent of sea ice melting. Open water absorbs around 94% of the sun’s energy per unit area. The Arctic Ocean is absorbing much more heat as a result.
- Melting ice means more ocean heat is transferred to the air in autumn, distorting freezing and warming near land areas.

**Several positive feedback factors are involved**

Slide 18
[...], a nearly ice-free Arctic Ocean in September before mid-century is likely for RCP8.5 (medium confidence).
Norwegian Young sea ICE cruise (N-ICE2015)
Atm. conditions affect thin ice easier
- Higher variability expected
Dark ocean absorbs sun light

Arctic Ocean warms up

Slide 22
Recent (2005-2008) Central Arctic Fall Temperature Anomalies Greater Than +5° C

- Already Seeing an Atmospheric Climate Impact In Early Winter from Loss of Sea Ice

Slide 23
The Arctic influences climate patterns well beyond the boundaries of the Arctic itself

Temp. gradient between mid-latitudes and Arctic weakens

- Influences jet streams track and speed ("waivier")
  - Causes slower flow of weather systems, which increases the probability for long-lasting extreme events
  - Changes distribution of temp. og precip. patterns

Slide 24
Extreme winter in USA & Canada
Extreme winter in England

Slide 26
Consequences of Arctic warming

- More extreme weather events
- Thawing of permafrost on land and in ocean
- Increased sea level
- Increased hydrological cycle
- Surprises…
Challenges & opportunities

- Climate change, biodiversity, pollution

- New commercial activities - tourism, fishing, shipping, petroleum activities and mineral exploitation
Thank you!
1. My name is Daniel Kochis. I am a research assistant with the Margaret Thatcher Center for Freedom at The Heritage Foundation in Washington, D.C. In my role at the Thatcher Center, I work in part on Arctic issues, specifically how the North Atlantic Treaty Organization (NATO), the United States (US), and the United Kingdom (UK) could respond to the security and economic challenges and opportunities emerging in the region. I have traveled to four Arctic nations, and focus my work on transatlantic relations. My testimony will examine the economic opportunities and challenges for the UK in the Arctic.

The UK Has a Significant Interest in What Happens in the Arctic

2. The United Kingdom has an interest in a stable and secure Arctic region. While not an Arctic nation, the UK is the world’s sixth-largest economy, and has varied and substantial business interests in the Arctic region that are likely to grow over time. The UK is the country that is geographically closest to region while not having any territory above the Arctic Circle. For economic, geographic, and political reasons, the UK has an interest in the Arctic and should work to ensure that the region is both politically stable as well as economically free.

3. The concept of economic freedom has shaped the UK into the nation it is today and is the key to prosperity. Economic freedom is defined as “the condition in which individuals can act with autonomy while in the pursuit of their economic livelihood and greater prosperity.” Free trade is an essential component of a free economy; the exchange of goods or services by two or more parties who view the exchange as to their benefit. Economic freedom spurs innovation, prosperity, and respect for the rule of law. As the intellectual incubator of economic liberalism and successful practitioner of economic freedom, the UK has lived the benefits of an economy and society structured in this way. For centuries, economic liberalism was one of the UK’s chief intellectual exports and it colored the diplomatic, military, political, and social decisions made by the nation.

4. In many ways the Arctic is an untouched canvas, with vast potential that can be unlocked with the right mix of security, sovereignty, and economic liberalism. The lack of any substantial mention of economic freedom in the UK’s 2013 Arctic Policy Framework “Adapting To Change: UK policy towards the Arctic” is disappointing. The report addressed aspects of economic freedom as in page 23:

   **UK’s policy towards the Arctic is therefore to support legitimate and responsible business activity in the Arctic.**

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Yet the failure of the framework to make the philosophical case for the need for economic freedom in the Arctic was a missed opportunity. The House of Lords Select Committee on the Arctic should remedy this omission by making economic freedom a central theme in its report.

5. The premier forum for promoting cooperation, coordination, and discussion of Arctic issues is the Arctic Council, where the United Kingdom is a permanent observer. The UK should utilize this position, as well as its close bilateral relationships with the littoral nations in the Arctic, especially the special relationship with the United States, to help guide policies that advance sovereignty and economic freedom in the region.

The Economic Opportunities and Challenges in the Arctic

6. The melting of some ice during the summer months in the Arctic has already increased some economic activities in the region. Increased activity is set to have wide-reaching ramifications for the global economy, including that of the UK. By some estimates, investment in the Arctic could reach more than $100 billion in the period from 2012-2022. Furthermore, changes to global shipping, as well as the tourism, fishing, mining, and oil and natural gas industries should make the Arctic an important part of future planning for the UK economy.

7. The Arctic is thought to contain vast natural resources. The United States Geological Survey estimates the Arctic contains 46 trillion cubic metres of undiscovered natural gas, and 90 billion barrels of undiscovered oil. In 2013, The UK used approximately 1.5 million barrels of petroleum and other products per day. The potential of the Arctic to supply British energy needs for years to come is evident. Further magnifying the importance of Arctic energy is the UK’s growing reliance on imports to meet its energy demands, specifically energy imported from the Arctic nation of Norway. Michael Fallon, current Defence Secretary and former Minister of State for Energy, estimated that by 2030, the UK will import three-quarters of its natural gas. Yet, despite the expected bounty, resource extraction in the Arctic is technologically challenging and legally contentious, as was evidenced by Royal Dutch Shell’s decision to abandon plans to drill off the coast of Alaska in 2014. It is in the UK’s interest to encourage new resource exploration in the Arctic, especially in Norwegian territorial waters.

8. UK companies are heavily active in the Arctic region. BP plc (BP) for instance, has projects in the US, Canada, Greenland, Norway, and the UK, in addition to owning 19.75% of Russian company Rosneft. BP employs over 80,000 people worldwide, most in the UK, and has paid over £6 billion in UK taxes over the past five years, while spending over £7 billion a year with

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69 ibid.
Daniel Kochis – Written evidence (ARC0019)

other UK companies.74 Another company active in the Arctic, Royal Dutch Shell, employs over 6,500 people in the UK and 2,000 British nationals living overseas.75 These companies are just two examples of how businesses, workers, and taxpayers benefit both directly and indirectly from the economic opportunities of the Arctic.

9. Changes in the Arctic region also have the potential to cut costs and transit times for global shipping. The Northern Sea Route (NSR), which runs across the top of Russia and Norway through the Arctic Ocean, saw 71 transits in 2013,76 up from 46 in 2012,77 and 41 in 2011.78 This is particularly important for the UK as a country which depends on the sea for more than 90% of its trade. Shipping through the NSR could impact the British economy by reducing the amount of time required to send goods between Asian markets and the UK. The NSR reduces the amount of time required to sail between Shanghai and Rotterdam by 8% compared to sailing through the Suez Canal.79

10. Underscoring the challenges associated with operating in the Arctic, in 2014, ice conditions forced the late opening of the NSR. Whereas the NSR normally can be sailed from July-November, as of the middle of September 2014, no ships had transited the route due to lingering ice.80 Additionally, Russia has suggested that new fees might be levied on commercial shipping passing through the NSR. The UK has an interest in ensuring trade flows in the Arctic are not hampered by excessive or unnecessary regulatory or bureaucratic regulations. Despite uncertainties, the prospect for transit through Arctic waters via the NSR is likely to increasingly impact global shipping in the years. The time is now to push for policies that will allow these new sea routes to be used to full advantage.

The UK Has Strong Commercial Ties with Arctic Nations

11. Half of the member nations of the Arctic Council are also top 20 trading partners for the UK (United States, Sweden, Russia, and Canada).81 Perhaps the most significant economic relationship the UK has relating to the Arctic is with Norway. In 2012, Norway supplied 54% of imports of natural gas to the UK.82 In 2013, one-quarter of Norwegian exports were received

by the UK, with energy accounting for 88% of exports to the UK. In addition, Norway is the biggest external supplier of seafood to the UK.

12. The UK also has significant trade with the Arctic nation of Denmark. The UK is the 3rd largest export market for Danish goods, and Denmark the 22nd largest export market for UK goods. Trade between the UK and Sweden amounts to approximately €6.3 billion annually and Sweden is the 12th largest export market for goods produced in the UK. The UK has a strong trading relationship with Finland; as the 9th largest importer to Finland, UK imports to Finland totaled £1.75 billion in 2013. Finally, the UK is the largest supplier of imported services to Iceland, and the 10th largest supplier of imported goods for Iceland.

13. With strong trading relations with Arctic nations, the UK should advocate for policies that do not impede the free flow of trade.

Recommendations

14. As the world’s sixth largest economy and one with significant business ties to the Arctic region, the UK should make their voice heard on Arctic economic issues. For centuries, the UK has championed economic freedom; the nation’s current approach to the Arctic should be no different. Specifically the UK should:

- **Make economic freedom the centerpiece of UK Arctic Policy:** The failure of the UK’s 2013 Policy towards the Arctic to mention economic freedom should be rectified. The UK’s economic interests in the Arctic will only grow in years to come. The UK should promote policies that advance economic freedom in the region.

- **Place economic freedom front and center in the committee’s findings:** The Select Committee on the Arctic’s report should emphasize the importance of, and demarcate the philosophical, political, and businesses reasons for, why economic freedom must be a key guiding principle for the UK’s policy towards the Arctic region moving forward.

- **Leverage the US-UK Special Relationship:** The US Chairmanship of the Arctic Council, beginning in 2015, is an opportunity to leverage the US-UK special relationship to advance sovereignty and economic freedom in the Arctic. The UK should coordinate with its close partner to advance policies that help achieve this end.
• **Work to keep the flow of maritime traffic in the Arctic unrestricted:** Any unnecessary or excessive bureaucratic and administrative requirements to transit waters in the Arctic could lead to higher prices of goods for consumers, discourage economic activity, and limit economic freedom. The UK should work with Canada, Russia, and the US to ensure shipping lanes in the Arctic remain available to commercial traffic without onerous bureaucratic or administrative requirements.

**Conclusion**

15. The Arctic region will continue to change, bringing with it both challenges and opportunities. The UK has a chance to positively impact the future of the Arctic by promoting policies that encourage economic freedom and sovereignty in the region. The UK can magnify this positive impact by working in conjunction with likeminded allies, most importantly the US.

*September 2014*
Christian Le Mière and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)

**Evidence Session No. 4**  
Heard in Public  
Questions 37 - 49

**TUESDAY 22 JULY 2014**

Members present

Lord Teverson (Chairman)  
Lord Addington  
Baroness Browning  
Lord Hannay of Chiswick  
Viscount Hanworth  
Lord Hunt of Chesterton  
Lord Moynihan  
Lord Soley  
Baroness Symons of Vernham Dean  
Lord Tugendhat

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Examination of Witnesses

Christian Le Mière, International Institute for Strategic Studies, and Dr Jeffrey Mazo,  
International Institute for Strategic Studies

**Q37 The Chairman:** Gentlemen, I welcome you to this Select Committee on the Arctic area.

This is still towards the beginning of the process. Today we are looking at defence security, and in our second session today the international law around UNCLOS. As you know, this session is being broadcast. I will ask members of the Committee to ask you a number of questions, and I think you have some idea of the areas that we will be going over. I remind you that if you could keep your answers fairly direct, that would be useful, but do ensure that we have all the information that we need. You do not both need to answer every question, but if you have something important to contribute, please do. If there is anything that you feel you have left out or that has not been gone through by the end of the session, you are very welcome to
offer that extra information as written evidence. I shall ask you briefly to introduce yourselves, and then I will ask Lord Addington to ask the first question.

**Christian Le Mièrê**: My name is Christian Le Mièrê. I am the senior fellow for naval forces and maritime security at the International Institute for Strategic Studies. I am based here in London and my remit is very much everything that happens at sea. The Arctic is a key area of that, but I also focus on other areas of the world such as the South China Sea, the Persian Gulf and anywhere there may be conflict or contention over the resources of the sea or the use of it.

**Dr Jeffrey Mazo**: I am Jeff Mazo. I am consulting senior fellow for environmental security and science policy at the IISS. I have been working with Christian on our Arctic project for about three years. My main focus is on the security and strategic implications of climate change writ large, and the Arctic is a big part of that.

**The Chairman**: Thank you. We are very pleased that you are able to be here.

**Q38 Lord Addington**: Hello. What in your view will be the main changes that we will see in the Arctic over the next 20 years, bearing in mind that we are not absolutely sure exactly what changes are going to take place in the sea ice there? Once again in your view, are such changes contributing to tension between the Arctic states, and, if so, how exactly?

**Dr Jeffrey Mazo**: The main trend that we see is an increase in the human presence and concomitant economic activity in the sub-Arctic and north of the Arctic Circle, driven by increased maritime access due to a decline in the sea ice, as well as changing demand in global consumption patterns for hydrocarbon resources and competition for the market share of new sources. As you say, the timing of these trends is uncertain; the evidence that you heard last week shows that there is no scientific consensus about how quickly some of these physical changes will happen. We focus in our work on what we see as a mid-point view among scientists of about 2030 for seasonal ice-free conditions in the Arctic and mid-century for
sustained and reliable access, but it could happen sooner or later than that. This uncertainty is actually an important driver of the economic and geopolitical developments that we foresee. We see hydrocarbon extraction as likely to increase over this time period but the relative share of global energy coming from the Arctic is not likely to change significantly and might even decrease. We see an increase in shipping in the summer between Arctic ports and from the Arctic to non-Arctic destination, particularly with regard to hydrocarbons, but not so much of an increase in trans-Arctic container shipping. The latter is likely to play out only later in the century when and if the transpolar route becomes reliable. As a rough idea, we see an increase in shipping activity in the Arctic of an order of magnitude of about 10—a multiple of 10 over the next 20 or 25 years. That is based on the current levels, which I should point out are actually lower than at the peak of maritime activity in the Arctic in the 1980s during the Soviet period. We are still at only about half that level at the moment.

There are also likely to be increases in tourism, which we already see happening; in fishing, or at least geographical changes in the pattern of fisheries; non-hydrocarbon mineral extraction; and some niche high-value economic activities, as the Arctic becomes more accessible. All these trends will require significant infrastructure expansion and replacement as well as supporting service industries, and all this increased human activity and expanding population will require an expanding security and constabulary presence, which we also already see happening. However, we do not see these trends as necessarily contributing to tensions. The Arctic is currently a region of co-operation and low tension, although security co-operation and the security architecture lag perhaps two decades behind the political, environmental and economic co-operation that we see in the Arctic. As long as development can keep pace with the physical changes that we expect, we do not see necessarily any increase in tensions.
Christian Le Mièrè and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)

We do not see any evidence of a race for resources in the Arctic. The known or expected resources in the Arctic, particularly oil and gas, are for the most part—90% to 95%—to be found in undisputed national territories or exclusive economic zones, and very little of the remainder is likely to be in areas that are likely to be contested after the UN Commission on the Limits of the Continental Shelf makes its rulings on various claims. The high-profile disputes that we see about Arctic territory have little substance behind them; they are more a question of national pride and internal politics. There is ample time for them to be damped down and solved before the issues really need to be resolved.

A lot of the claims that are being made now over the Arctic are not representative of a race for resources at present but are simply the consequence of the terms of the UN Convention on the Law of the Sea, which states that you have to make your claim to extend the continental shelves within 10 years of ratification of the convention, which for Canada was last December and for Denmark is this year. The Russians made their claim quite early on, while Norway’s claim has already been submitted and resolved. The Canadian claim, which is the one most likely to overlap and conflict with Russia’s, is driven as much by this 10-year deadline as by any urgency to get the situation resolved. The conditions in the Arctic are changing slowly enough, and the deliberations of the UN commission are slow enough, that these issues are not likely to be resolved for 10 or 15 years anyway.

Christian Le Mièrè: I want to add one thing. I concur with everything that Jeff has just said—obviously, because it is primarily what is in our book—but equally the major political change over the next 20 years will be driven by this greater economic activity, so there will be a greater geopolitical engagement with and focus on the Arctic, though not necessarily competition. However, there are individual factors that may complicate the Arctic situation, and I would point out the potential for the independence of Greenland as one of them. Twenty
years may be an ambitious timeline to foresee Greenlandic independence, but if it were to come about and Greenland were to become economically sustainable and independent, we would suddenly have a relatively small in population and politically juvenile nation state as one of the Arctic five. Denmark might remain as an Arctic state because of the Faroe Islands but would no longer be littoral on the Arctic Ocean. Greenland would not necessarily be within NATO or indeed the EU but might perhaps still have a US base on it, and would be subject to greater pressures from the larger and wealthier states within the Arctic. Greenlandic independence would be an interesting event, with consequences that are largely unforeseeable and could complicate the Arctic picture.

Q39 Lord Hannay of Chiswick: To follow up that very welcome point about Greenland, you put a question mark over it because 20 years seems quite a long time to be certain that Greenland will not be independent. Presumably one of the consequences that you foresee, if Greenland were not to join NATO as an independent state, would be that it would no longer, as it currently is, be covered by the Article 5 guarantee—that is, for the first time there would be a littoral state in the Arctic that was not so covered or, alternatively, was not Russia or the Soviet Union. Could you comment on that and its likely destabilising effect, if any?

Christian Le Miére: That is a quite possible outcome. I am not sure that it would be destabilising. There are already two Arctic states that are not NATO members, Sweden and Finland, that border on or are very close to Russia—the Soviet Union, as was—and while they were very aware of the potential threats to their borders and sovereignty, they nonetheless did not necessarily see the need for NATO membership to guarantee their political survival. The situation with Greenland is further complicated by the US base at Thule and the potential for continued interaction with the US through that base. If you have US troops on your territory as an independent nation state, even though you may not be subject to Article 5
guarantees you can feel relatively confident that that is a hair trigger for greater international involvement in questions of your sovereignty. It is a complicating factor within the picture but not necessarily destabilising. However, it certainly makes the region a little more interesting.

**Q40 Lord Tugendhat:** I was very impressed when I read the IISS’s recent paper on the Arctic. I thought it was very interesting. However, it dealt with the Arctic, as it were, as a self-contained entity. Surely one of the big unknown unknowns, and something that we need to take into account, is that now that we are seeing the beginning of commercial shipping on a substantial scale, the use of natural resources and so forth, what happens in the Arctic will be very much influenced by what happens in the rest of the world. If, for example, the Suez Canal were closed as a result of troubles in the Middle East, or if there were a much more serious piracy problem in going around Africa, issues of that kind would certainly have an impact on the speed at which commercial shipping was developed over the northern sea. Likewise, oil and gas have had a profound impact; had it not been for the reserves in place and the production in the Arctic regions, what is happening in the Middle East, with all its dangers, might have had a greater impact on the oil crisis. To the extent that energy resources in other parts of the world are put at risk, that is likely to lead to a much more rapid development of resources in the Arctic. One of the difficulties I am having in coping with this very interesting question is the power of optionality, if I can put it that way. In terms of both shipping and natural resources, the Arctic is a very important new option, and the extent to which that optionality moves ahead will depend on what happens outside the Arctic, not on what happens within the Arctic.

**Dr Jeffrey Mazo:** I think that is true. One of the reasons why we do not see hydrocarbon extraction in the Arctic as likely to have a greater relative share of the global energy market is that it is one of the most expensive options. It is certainly the most expensive oil and gas at the moment, more expensive than conventional oil and gas and in some cases more so than some
Christian Le Mièr and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)
of the unconventional sources. As you say, that could change in response to economic
developments elsewhere in the world, but the proportion of available resources expected to
be found in the Arctic over the next 20 years or so as exploration proceeds is equivalent to the
proportion of current contribution of energy extraction in the Arctic. So we see the Arctic
being, as you say, an important alternative source in these cases but we do not see that as a
change. That is certainly the case at the moment, and we do not see that happening over the
next 10 or 20 years.

With regard to the changes in maritime routes, that again is very much dependent on the
speed of climate change in the Arctic and the accessibility. Until the northern sea route
becomes reliable, particularly north of some of the offshore islands and the straits, it is not
going to be a viable alternative to Suez.

**Lord Tugendhat:** It might not be a viable alternative to Suez, but if Suez were closed or Saudi
Arabia went down, the world would look very different. That is my only point.

**Dr Jeffrey Mazo:** That is true. However, in the timeframe that we are looking at, whether the
Arctic is a better alternative than the Cape, for example, even though that would be much
further, depends on huge range of economic variables, the most important of which is the cost
of fuel. In a scenario where the Middle East goes down and the cost of fuel rises significantly,
that saving in the Arctic will be significant.

**Christian Le Mièr:** I agree with the concept that the rest of the world affects the Arctic, but I
would add that it can go either way; if the oil price drops, oil and gas exploitation in the Arctic
is likely to slow rather than become more rapid. The difficulty in writing this book, and in
dealing with the Arctic generally, is that there are so many variables that are unknown in the
future and we are dealing with such long timelines that it is impossible to predict accurately.
We can talk broadly about the retreat of sea ice and be quite confident about that direction
but not necessarily about the pace. Equally, we can talk about greater economic exploitation but, again, only about the direction, not the pace. I concur, but it is difficult to say that it will necessarily be made more rapid by external events rather than less rapid.

**Lord Soley:** The areas that I am looking at are the two of concern around both the United States and Denmark/Greenland. It is not a dispute but there is some uncertainty about the 200 nautical mile extension of the continental shelf. In the case of Denmark/Greenland, that would include the North Pole. I think again of Russia a few years back planting its flag at the North Pole and, perhaps more importantly, the UN Commission on the Limits of the Continental Shelf asking Russia to review its submission. I wonder whether there is a potential conflict coming up over those areas. I am talking about the type of conflict that will need legal resolution.

**Christian Le Mièrè:** The witnesses in your second session today will probably be better placed to talk about the various issues regarding the law of the sea, but I would say that there are certain disagreements, and currently this is probably the primary one, over maritime jurisdiction in the Arctic. The word “conflict” is obviously loaded with a lot of different baggage. We consider the possibility of conflict in the Arctic to be relatively minimal, not least because it is being handled largely through co-operation. In fact, that dispute is being handled through the legal channels outlined by the law of the sea. The Arctic Council and the Ilulissat Declaration of 2008 have reaffirmed the primacy of UNCLOS as the legal instrument under which such disagreements will be resolved if negotiations do not work. Also, it is very hard to fight a conflict in the Arctic, as the UK and most Arctic countries know. The area that you are talking about in which the overlap exists for potential continental shelves is still under sea ice year round, so the idea of a conflict is difficult to entertain, even though there will continue to be disagreements until we reach the most probable outcome of a legal conclusion.
Q42 Baroness Symons of Vernham Dean: You said a moment or two ago that there was no evidence of a race for resources, but there is surely evidence of a race to invest. There is China obviously, and Iceland has been the first European country to sign a free trade agreement, but in your book—obviously we are going to refer to your book quite a bit—you seem to suggest that Beijing is attempting to develop greater soft power and economic influence over what might be described as some of the weaker members of the Arctic club: Iceland and Greenland, for example, which is obviously pretty desperate for investment. This is not just China, obviously, but Singapore, Japan and others.

I just wonder how the extension of the Arctic Council observer status is likely to develop, it having taken place and now watching it develop over the next few years. Do you think it will have an impact on the relationship between the Arctic states themselves? Coming closer to home, do you think it will have an impact on our relationship with those states? Saying that there is no race for resources is a nice line to draw, but actually there is quite a race for investment. The possible control of resources might be another matter, and there might be impacts for us.

Christian Le Mière: I will speak briefly on a couple of topics and Jeff will talk about the Arctic Council observers. We discuss the possibility of a national race for resources backed up by military power, which we consider to have a very low probability. But you are right: there is a lot of commercial competition in the Arctic, and we see that weekly, with various companies engaging in competitive bids for contracts or attempting to exploit the various economic potential of the Arctic. That could be seen as healthy and a positive development for the region and for the countries that are involved.

On China’s involvement, it is very easy to see nefarious motivations behind China’s activities, not just in the Arctic but elsewhere in the world, but in reality China has been a relatively
positive engager with the Arctic generally. Its investment in Greenland has been positive for that province as well, albeit with some concerns over the potential for Chinese immigration. Its investment in Iceland has broadly positive, although a particular bid to gain access to land within Iceland was subject to widespread public disapproval and eventual blocking, and it has developed fairly positive relations with most of the Nordic countries, Norway notwithstanding, given the Nobel Peace Prize issue. So while there is some concern, particularly among Nordic states, about China’s involvement and potential for greater soft power, there is also very much a welcoming atmosphere for Chinese investment, as there must be if you wish to develop some of the resources of the high north, which are difficult to get to. China is likely to be one of the largest clients for some of those resources. That is a roundabout way of saying that there is commercial competition, some of which is nationally based because China has state-owned companies, but it is not necessarily an unhealthy competition to have.

How that affects intra-Arctic relations is a bit too early to say, but there is broad acceptance among the Arctic states that Arctic issues should be dealt with by Arctic states. That includes issues to do with the law of the sea and fishing. There is, for instance, discussion about having an Arctic coastguard forum and about having rules and regulations for fishing on the high seas in the Arctic Ocean that will be drawn up by the Arctic states themselves. They often jealously guard their stewardship of the Arctic Ocean and the resources in the Arctic. That excludes countries such as China that might wish to have a more engaged presence within the Arctic Ocean, so I am not sure that it will necessarily affect intra-Arctic relations that significantly until and unless China gains some undue influence over some of what you call the weaker states of the Arctic, such as Greenland, which we do not currently foresee.

I think the UK’s relations with the Arctic states are relatively secure, particularly with the Nordic states with which we have long historical cultural links. They are obviously quite tricky
Christian Le Mière and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)

with Russia, as they have been on and off for a long time, but it is the issues beyond the Arctic, such as Crimea and Ukraine, that are going to affect UK/Russia relations and Sino-Russian relations more than the Arctic currently. So again, while obviously the UK will have to compete for influence and for commercial involvement in the Arctic with other states such as China, that competition is not necessarily unhealthy and not necessarily to the detriment of the UK.

**Dr Jeffrey Mazo:** I would like to add a couple of things. One is that the new observer states, particularly the ones from Asia, have varying interests in the Arctic and a varying desire to be involved in the Arctic Council. China obviously has the commercial interests that you mentioned. Japan’s interest is driven as much by China’s interest and keeping a wary eye on its neighbour than by any other particular interest, although all the states in north-east Asia have real scientific reasons for wanting to be involved in Arctic research. The changes in weather patterns that will affect them will be driven by climate change in the Arctic, so China’s increased scientific research in the Arctic is legitimate in that respect, even if the volume and the prominence of that have some sort of geopolitical symbolism attached to them.

On their acceptance as observers in the Arctic Council, one of the reasons driving the Arctic Council members to bring them on board is that by doing that they are in effect agreeing to the status of the Arctic Council as the primary forum for Arctic issues, as well as the primacy of UNCLOS as the governing law for the Arctic. It is about locking them in and making them less of a wild card. However, some of the concerns about expanding the number of observers to the Arctic Council might affect the role of the council. One of the unique benefits of the Arctic Council was that it was a very small, intimate group working by consensus among the Foreign Ministers and the Arctic ambassadors of the Arctic states, and the bigger and more unwieldy the council and observers gets the less efficient it will be in that respect. At the meeting in Yellowknife earlier this year, China sent a huge delegation of experts, most of whom did not
need to be there. Also, most of these Arctic Council meetings are in the Arctic, for obvious reasons, and these areas have a lack of infrastructure, and a lack of hotel rooms, and by doubling the number of observers and drastically increasing the number of people being sent to the meetings you put a strain on the operations of the council. This was a concern.

I have one more point to make. The expansion of the number of observers risks diluting the role of the indigenous peoples, who have a unique position on the Arctic Council—a position that they do not have in similar forums for other parts of the world.

Q43 Lord Hunt of Chesterton: If your presentation was being given by Russians, would it be very different? If I may say so, it seems to have a terribly western flavour, and the Arctic is largely Russian. Could you comment?

Christian Le Mière: Yes. The Arctic has a very emotional and cultural relevance to Russia and Russians in general, so I have no doubt of the possibility of a bit more table thumping and strenuous rhetoric if there is to be a Russian presentation, but there is a real mismatch between Russian rhetoric and the reality of Russian policy. We saw last year, for instance, President Putin proclaiming the importance of the Arctic while sending a flotilla to the new Siberian islands and declaring that there will be a new permanent base, but in reality there is very little knowledge of what that base will be, how permanent it will be, what will actually be built there and what will be kept there permanently. There is talk of increasing Russia’s military presence in the Arctic, but actually most of its attention is currently focused on the south and the West, given the issues in Ukraine and the Caucasus, and most investment is actually going to the navy—or at least most new forms of ships are going to the navy, specifically to the Pacific Fleet, the Black Sea Fleet and Baltic Fleet, rather than, as traditionally, to the Northern Fleet.
So there are the occasional outbursts of nationalist rhetoric, and not just by the Russians but by the Canadians, for instance, but what Russia is doing in the Arctic is pursuing legal channels for its disagreements over continental shelves and maritime jurisdiction, and investing in renewing its military presence in the Arctic but to a far lesser extent than it did during the Cold War, often because other areas of the country require greater military investment. It does not necessarily match the sometimes nationalistic, sometimes alarming rhetoric that comes out of Russian politicians, Russian military, retired military personnel or grandstanding private citizens.

**The Chairman:** Can I just have clarification on something that you can perhaps help me with? We had circulated to us the *Arctic Journal* of Thursday 17 July, which states—I do not know how accurate it is—“‘EU raw materials diplomacy’ with hundreds of millions of euro available in exchange for guarantees that Greenland wouldn’t give China exclusive access to its rare earth minerals, as said by Antonio Tajani, vice-president of the European Commission, when he visited Greenland in June 2012”. Does that have any accuracy to it?

**Christian Le Mièvre:** I genuinely do not know whether that occurred, because it was a private discussion, but there is concern in the EU and the US that Greenland’s rare-earth minerals could be exploited by a Chinese state-owned company, given China’s current lock on the rare-earth market. That could be seen as a negative strategic issue. But, again, Greenland is concerned by the possibility of Chinese immigration in particular and by greater Chinese influence. There is awareness in Greenland, the EU and the US that these minerals should be exploited for broad benefit and commercial gain rather than for one state’s particular gain.

**The Chairman:** I think we will pursue that elsewhere.

**Q44 Lord Hannay of Chiswick:** Could you say a bit more about the role that the Arctic Council plays in good governance of the region? Will the council need to evolve, presumably to take on
greater powers by agreement among its members, and how will it evolve? Perhaps in answering that question you could distinguish a little between the Arctic Council as a governing instrument, and on the idea that there could be sectoral agreements among the members of the Arctic Council dealing with a particular issue such as transport, safety, mineral exploitation or biodiversity. I think they are two rather different things, and perhaps you could cover both of them.

**Dr Jeffrey Mazo:** The Arctic Council bills itself as an intergovernmental forum rather than an international organisation. It is a policy-shaping organisation, as they say, rather than a policy-making organisation. Nevertheless, it is currently the most prominent and the most effective body involved in issues of Arctic governance. The main gap in Arctic governance is the need to develop various agreements in different areas to operationalise UNCLOS in the region, but these can be subregional, or bilateral between states, or can deal with parts of the Arctic including non-Arctic states. Current instruments that meet this pattern and involve part of the Arctic are the OSPAR environmental agreement and the north-east Atlantic fisheries agreement. There are some agreements and negotiations involving the A5—the five coastal states—and others that are taking place at the Arctic Council level. Various agreements and treaties have been passed in the last couple of years on search and rescue co-operation and oil spill response, and although they are often referred to as Arctic Council agreements they are in fact multilateral agreements among the Arctic states. They were agreed under the auspices of the Arctic Council but are not formally Arctic Council instruments. Then there are various other instruments affecting the Arctic at a more general international level, such as the development of the mandatory Pole Code under the IMO.
Christian Le Mièrè and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)

There are various gaps in Arctic governance, and the Arctic Council is positioned to deal with some of them but not all of them: it depends on the geographical scope of them and the interests of non-Arctic states.

The other main gap in Arctic governance is security and developing a security architecture. The Arctic Council is explicitly excluded by its original remit from dealing with security issues. The Arctic Council is evolving and has been evolving constantly since it was established in 1996. With the new observer states, now over 50% of the world population is represented by either members or observers. In 2013, for the first time it got a secretariat in Norway, which is already starting to improve its efficiency and operations. It is still very small, but it has a communications strategy, which it did not have before, so it is beginning to gel and come of age. Some people have referred to the Kiruna meeting as the end of the adolescence of the Arctic Council, and the Kiruna ‘Vision For The Arctic’, which the UK in its Arctic framework has supported, calls for an aspiration for a transition from a policy-shaping into a policy-making body. To make that formal requires some sort of Arctic convention, whether among the Arctic eight or more broadly, but for political reasons in the various Arctic states I do not think that is likely to happen. What is more likely is that the Arctic Council will evolve over the next 16-year cycle of the chairmanships of the eight states into the central pillar of a multilayered, multi-instrument governance regime similar to what we see in the Mediterranean for example, with various different environmental and search and rescue agreements, and other agreements of that nature, and the Arctic Council at the centre of it.

Whether it will expand its role to cover security issues is a huge question. The exclusion of security issues originally in 1996 was driven mainly by the United States. The United States’ view on this has shifted a great deal; and with an eye towards the US chairmanship in 2015, last week and for the first time America appointed an ambassador-level senior Arctic official,
who is a retired coastguard admiral with considerable experience of Arctic issues. That suggests to me that the United States is going to make security, in the form of constabulary co-operation, a key feature of its chairmanship in 2015-17. Whether this is the right venue to do this—Christian can talk about some of the other elements of an Arctic security architecture—is an open question, especially with regard to the blowback from the Crimea. The main impact on Arctic governance from that has been to do with security issues, and if they had been central to the Arctic Council they would have had a negative impact on other co-operation in non-security areas as well.

**The Chairman:** We will come on to that a little later.

**Lord Hannay of Chiswick:** Could I follow up on that very briefly and ask you whether you are really saying that the Arctic Council is metamorphosing very slowly into an international organisation, while saying that it is not doing so? Is that roughly what you are saying?

**Dr Jeffrey Mazo:** Yes.

**Lord Soley:** You used the analogy of the Mediterranean. Do you mean that it is like that, or do you mean that it is different from what is happening in the Mediterranean between the regional states?

**Dr Jeffrey Mazo:** It will be different to some extent. There is no equivalent to the Arctic Council for the Mediterranean, but most of the world seas have some sort of regime, such as multiple overlapping sets of instruments. I just use the Mediterranean as one of the most developed examples. The Arctic Council has a fairly unique position, at least at the moment, in maritime governance.

**Q45 Baroness Browning:** Could I ask you about the interface with NATO? I will split this question into two sections. The first is on the five member states of the Arctic Council, which are members of NATO. We have been given the impression that there is no settled view
Christian Le Mérier and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)

among these five states on NATO. In particular, there is a difference of opinion between Norway and Canada. Could you explain Canada’s reservations a bit more and why you think there is a lack of consistency at that level? The other issue is to do with the United Kingdom and our observer status. You have already mentioned that in the UK policy framework the UK Government committed to the Arctic Security Forces Roundtable. Could you flesh out a bit for us what it actually discusses? It is UN-sponsored. Is this part of the incremental move towards more militarisation of the Arctic, is it a precautionary measure, or is it frustration that you have a mix of countries, some of which are NATO members and some of which are not?

**Christian Le Mérier:** On the first topic, there is certainly disagreement among the Arctic NATO members on how closely NATO should be involved in the Arctic and what its role should be. Norway has traditionally been perhaps the most forthright in advocating a stronger NATO presence and involvement in the Arctic. An interesting factor here will be the fact that the new Secretary-General of NATO is Norwegian, and just last month he wrote an article extolling the global importance of the Arctic, but if he wishes to increase NATO’s role in the Arctic he will have to overcome significant internal resistance, particularly from Canada. It was Canada that has prevented the Arctic from becoming a more significant issue in NATO previously, particularly in official statements. The reason for that is a little difficult to work out, but the best guess is that Canada fears a wider internationalisation of the Arctic issue. It does not wish to see the North-West Passage designated as an international strait as the US would like, because it considers them to be territorial waters. It does not necessarily wish to have extensive external involvement in the Arctic, because the Arctic can be resolved by the Arctic states. Prime Minister Stephen Harper has previously opined that the Arctic Council has expanded too quickly and involved too many observers from outside the Arctic, which is diluting and complicating the interactions of the Arctic states themselves.
There seems to be a very visceral discontent in Canada about the possible internationalisation of the Arctic among a wider audience, part of which would be the greater involvement of NATO in the Arctic. Equally, Russia would almost certainly react very negatively to a greater NATO role, so Canada may simply be cautiously and sensibly trying to prevent that negative reaction from Russia by keeping NATO out. How that develops under the new Secretary-General will be interesting to watch. Even though the last Secretary-General was Danish, this one seems to have an even stronger view that NATO could be involved in the Arctic. That has been publicly espoused previously.

The Arctic Security Forces Roundtable is very much the operational level of discussions among the Arctic states and near-Arctic states on how to interact, rather than the high-level chief of defence meeting of the previous two years, although it might not happen this year. ASFR looks at things like maritime domain awareness and sharing information, such as AIS data and any other maritime information, which would allow for interaction and greater awareness of traffic in the Arctic and better jurisdiction and constabulary activities there. The difficulty with ASFR is that the Russians have traditionally been very circumspect about attending high-level meetings in particular, so it has been difficult, from what I understand, to entice significant Russian involvement in the ASFR that would allow for any substantial agreements on information sharing or intelligence sharing, for instance.

**Q46 Baroness Browning:** You said that there are many variables looking into the future. I guess this question, which I have been prompted to ask you, is about one of them, so I will not ask it. It was, “Will NATO play a more active role in the future?”. I do not know that anybody can answer that, but I just wonder what is available publicly on contingency situations. Presumably NATO itself, regardless of who is Secretary-General, must in its contingency
planning look at all the member countries in the Arctic Circle and a “what if?” situation. Is that well advanced, or has it, because of the nature of the Arctic, been on the back burner?

**Christian Le Mière:** NATO is an organisation with decades of experience behind it of dealing with the Soviet Russia in the era of the Cold War and afterwards. Part of that thinking about Russia and the Soviet Union involved contingency planning for areas of the Arctic or high north. In particular, the member states of NATO believed the Arctic to be, and used the Arctic as, a strategic area for ballistic missile submarine deployments, so they also tracked and attempted to disrupt Soviet submarine deployments underneath the Arctic and through the Greenland-Iceland-UK gap. They were also aware of the possibility of Soviet encroachment into the Arctic through Finland and Norway. I am obviously not party to contingency planning within SHAPE, but I am aware that a variety of contingencies have been thought about, particularly vis-à-vis Norway and Russia, and it is likely that these could simply be dusted off and brought back to the table again.

As for NATO's future role, the internal resistance from Canada is probably sufficient for the foreseeable future to prevent any significant role, and certainly any permanent presence, within the Arctic. There will continue to be a rotational presence through exercises such as Gold response, but I think that NATO's role is likely to be limited. NATO/Russia relations are obviously in a very poor state at the moment. There has been an attempt to improve NATO/Russia relations for the last 20 years, and any permanent presence in the Arctic would set that process back even further, so strategically it does not seem to be a sensible move for NATO to make.

**Lord Hannay of Chiswick:** What, if any, relevance does the Organization for Security and Co-operation in Europe have in the Arctic, given that, strangely enough if I have it right, all members of the Arctic Council are members of the OSCE? I always get a complete blank when I
Christian Le Mièrè and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)

ask this question. Could you perhaps fill in the blank a little and explain whether it is relevant, and if it is not relevant, why is it not relevant?

**Christian Le Mièrè**: It is theoretically relevant. The OSCE, as an organisation that is dedicated to early-warning conflict prevention—and, as we say, contains within it all the members of the Arctic Council—has a mandate that is very relevant to the Arctic in preventing any potential conflict from developing and perhaps allowing for greater information sharing and awareness to encourage co-operation. But practically I am not sure how relevant it is, given that the Arctic states are relatively jealous of Arctic issues and wary of wider internationalisation or the involvement of extra-regional international organisations when they think that the Arctic Council at the moment is perfectly sufficient to do the job of jurisdictional or constabulary issues within the Arctic itself.

**Dr Jeffrey Mazo**: One reason why you get a blank reaction when you ask this question is that it does not come up in discussions that we have had with diplomats from various Arctic and non-Arctic states and with analysts, observers and the military. No one ever brings up the OSCE; it is just not on anybody’s radar. Having said that, it can be one small contribution to this multilevel and multi-instrument governance structure for the Arctic.

**Q47 Lord Tugendhat**: I think we have already had the answer to this question in reply to others, but I will put it just the same: to what extent do you think the Arctic Council and wider Arctic co-operation is insulated from global frictions? In your view, have the recent events in Crimea and so forth, for instance, impacted on relations between members of the Arctic Council?

**The Chairman**: I would like to add to that. We understand that Canada is being a bit more direct in terms of where it has meetings or who it allows to meet it when it comes to the Russians as a result of the recent crisis, and is potentially boycotting working group meetings in
Christian Le Mière and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)

Russia. I do not know whether that is true and whether you have any feedback on it as an answer to the additional part of that question.

**Christian Le Mière**: I will let Jeff talk about the Canadians and the working group. Events in Ukraine have definitely affected the Arctic. We have seen, for instance, Sweden increasing its defence budget last year for the first time in quite a long period. That has been inspired by concern over Russia and galvanised by events in Ukraine and various events such as the flying of strategic and long-range bombers close to the Swedish border and the Swedes being unable to react. So a long period of decline in the defence budgets of Nordic countries, notwithstanding Norway, is likely going to see something of a change now that there is greater concern about Russian aggression or intervention in its near abroad. We have seen an effect on military diplomacy in the region, in that the chiefs of defence meeting is not likely to go ahead this year; it is simply impossible for American military personnel to sit down at a table with Russian military personnel in the current diplomatic climate in order to make any substantial negotiations possible. So the CHODs meeting seem to be suspended, the ASFR has had no significant Russian involvement in it, and the North Atlantic Coast Guard Forum proceeded without Russian involvement as well. There have definitely been effects on the military and security sides and those are likely to continue, given continued concern among Nordic states over Russian assertiveness in its near abroad.

**Dr Jeffrey Mazo**: On the question of Canada and the working group, it is a fairly low-level meeting. It is actually a task force, which is a level lower in the Arctic Council than a working group meeting, on black carbon issues. It was the third one that they had held. Canada boycotted the meeting in Moscow specifically as a sanction against Russia over Crimea, but there was a follow-up meeting of the working group—the fourth scheduled one—in Helsinki two months later. Canada chaired that and Russia came, so I think it was just to do with the
Christian Le Mièr and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)

geographical location. The meeting happened to be held in Moscow, even though it was not a
Russian-led meeting, and Canada found a useful symbolic way, without really affecting the
work of the council or its working groups, to make its displeasure known. The senior Arctic
officials meeting in Yellowknife went ahead after the invasion of Crimea, and all eight senior
Arctic officials attended that. So far at least, although there is a bit of posturing it is not really
affecting the work of the Arctic Council.

Having said that, I agree with Christian that it is not entirely isolated. As long as the Arctic
Council does not have a major security co-operation role, it is likely to stay insulated to some
extent—as much as any other international co-operation. Russia’s interest is very strongly in
keeping the Arctic isolated, so it is really a question of whether the other Arctic states feel that
it is an appropriate venue for sanction. To some extent, it is not about the Arctic Council; the
US sanctions on the Russian-controlled oil company, which originally were on the chairman but
have recently been extended to various financial arrangements, could in the long term affect
Russia’s energy expansion in the Arctic. Whether that disinclines Russia from co-operating
further in the Arctic is an open question.

Lord Soley: For clarification, Mr Le Mière, I thought I heard you say that the Russians had flown
bombers close to the Swedish border and that the Swedes could not react. The Swedes have a
pretty good air force. Did you say that, and what do you mean when you say that they cannot
react?

Christian Le Mièrè: I did say that. It was a particular sortie last year, and the Swedes did not
have enough planes on the ground or the pilots available to react in time. They had to rely on
NATO’s air policing mission in the Baltic countries to shadow the Russian bombers along the
border. This was a significant concern to the Swedes. It became public knowledge, probably
because of a leak from the military, and it was a major issue that fed into the discussion around the defence budget for this year as well.

**Q48 Lord Hunt of Chesterton:** All these issues in the Arctic are also being considered by the United Nations specialised agencies such as meteorology—I used to work for the Met Office—UNEP for exploration and so on. The Arctic is a particular area for all these processes. The Antarctic is similar; the World Meteorological Organization has an Antarctic committee. I wondered whether the expertise, experience, and obviously interests of other UN agencies are somehow factored into the Arctic Council or vice versa.

**Christian Le Mière:** There are three UN agencies that are observers to the Arctic Council.

**Dr Jeffrey Mazo:** The UNEP is certainly one of them. Besides that relationship, the Arctic Council working groups work closely with these various agencies.

**Lord Hunt of Chesterton:** With regard to food and agriculture, fishing is obviously hugely important for the whole world there. That is a UN agency question.

**Dr Jeffrey Mazo:** Anything that the Arctic Council or the Arctic five do regarding fisheries will be within the overall framework of UNCLOS and as an operationalisation of the UN convention.

**Q49 The Chairman:** I shall finish off the session by asking you to give me one response each to the following. Bringing us back to the UK, what one thing, within this context, should the UK do or definitely not do? Could you give me something on the way this works?

**Christian Le Mière:** The main message from the military and security side is that there is unlikely to be military conflict but that there will be geopolitical and commercial competition in the Arctic, because there is significant economic exploitation to be had there. So it is very much in the UK’s interest to continue to engage with its allies in the region militarily, but also to attempt to expand its economic involvement within the Arctic for commercial reasons. The one thing that has not come up in the session that may be of interest for members is the issue
Christian Le Mière and Dr Jeffrey Mazo – Oral evidence (QQ 37 – 49)
of Scotland and its potential independence. We may all have our different opinions on how
likely or probable that is, but an independent Scotland would be likely to attempt to position
itself more closely with Nordic countries that are Arctic states as well. Given further devolution
towards the Scottish Government post-referendum, there may be an attempt or indeed a
facilitation for Scotland to increase economic, commercial or even cultural links with those
Arctic states.

Dr Jeffrey Mazo: There is one main thing that the UK could do that has not come up in this
session. The UK punches well above its weight in scientific research in the Arctic; it is by far the
greatest producer outside the Arctic states of scientific research that deals with the Arctic in
both the actual output and the percentage of its research budget. More involvement by the UK
in the detailed work of the working groups of the Arctic Council, which are not self-funded by
the council but rely on national funding, would both increase the UK’s influence in the Arctic
Council and have a beneficial effect on the work.

The Chairman: That is a good ending. Thank you both very much for your evidence. That has
been an excellent session, and I think we are a lot more enlightened as to how it all works. You
are both very welcome to stay here in the room if you would like to learn more about UNCLOS,
which I am sure you do.
Lloyds Register, Fednav, and Sovcomflot Overseas Holding Ltd – Oral evidence (QQ 131 – 141)

Transcript to be found under Fednav
Lloyd’s Register – Written evidence (ARC0048)

1. Summary
The objectives of this submission of evidence to the Select Committee on the Arctic are:
- To offer supporting data and insights on transit and destination shipping in the Arctic and, in addition, the characteristics of the UK registered Arctic shipping fleet.
- To contribute evidence on the technological challenges for future Arctic shipping activities
- To contribute evidence on the regulatory framework that will govern Arctic shipping
- To contribute advice, and views, on Arctic shipping to support consideration of the “UK dimension” by the Select Committee

Considering each objective in turn:

Key points on supporting data and insights on transit and destination shipping in the Arctic:
1. Very small numbers of ships use Arctic transits for voyages between ocean basins (i.e. Pacific and Atlantic basins) as an alternative shipping route to transits through the Panama or Suez canal
2. Shipping in the Russian Arctic is likely to increase, but will be mainly export shipping for dedicated natural resources projects. Transit of commercial ships through the Russian Arctic is likely to occur during the summer season only
3. The UK registered ice-classed fleet is small, with 119 ice classed ships, and just 8 ships potentially suitable for transiting the Russian Northern Sea Route independently in an average summer season

Figure 1.1 % of Ice Classed UK Fleet

Figure 1.2 Ice Classes assigned to UK flagged ships
Key points on the technological challenges for future Arctic shipping activities:
1. Technological challenges remain for efficient Arctic shipping with a significant build and operating cost premium associated with current generation of Arctic capable ships.
2. A combination of uncertainty of ice loads, and the development of much larger Arctic ship designs than hitherto, may lead to Arctic ships that are uneconomic in operation with reduced cargo carrying capacity and excessive hull structural steel-weights.
3. Dedicated, or specialised, ships designed for year round ice-going navigation, even those enhanced only for seasonal navigation in light ice conditions, are uncompetitive in build and operation costs when compared with open water shipping.

Key points on the regulatory framework that will govern Arctic shipping:
1. Canada and the Russian Federation have requirements that regulate Arctic shipping including seasonal limitations on ship operations in Arctic sea areas under their jurisdiction, primarily based on the ice strengthening standard (ice class) assigned to the ship.
2. International Maritime Organisation (IMO) finalised mandatory standards (“Polar Code”) for Polar Shipping in 2014. The entry into force date will be 1st January 2017. The Polar Code is intended to supplement SOLAS\(^90\) and MARPOL\(^91\), and covers additional aspects of ship design and construction for international ships operating in the Polar Regions.
3. The Polar Code will require limitations to be recorded on the Polar Ship Certificate i.e. ice conditions and temperature limits of ship operations.

Key points on Arctic shipping to support consideration of the "UK dimension":
1. There may be direct economic and/or employment benefits to the UK from:
   a. An increase in Passenger Cruise Voyages in the Arctic
   b. Imports to the UK of natural resources from the Arctic
2. UK Arctic shipping experience and knowledge will be difficult to sustain if current low volumes of Arctic shipping prevail in future. A similar situation does, however, prevail for most other countries interested in the development of Arctic shipping.
3. Any initiative, as part of a “UK dimension” of Arctic shipping, may need to consider co-operation with other countries with interests in development of Arctic.

\(^90\) International Convention for the Safety of Life at Sea, 1974 as modified by the 1988 SOLAS Protocol
\(^91\) International Convention for the Prevention of Pollution from Ships, 1973/1978
2. Contents

1. Summary
2. Contents
3. Introduction
3.1 Objective
3.2 About Lloyd’s Register
3.3 Lloyd's Register’s involvement with Arctic shipping
4. Arctic shipping
4.1 Arctic sea ice and “choke points”: transit shipping obstacles
4.2 Arctic shipping demands
4.3 Arctic shipping statistics
4.4 World and UK fleet statistics
5. Arctic Technology
5.1 Technological advancements to support expanded shipping activities
5.2 Technological challenges for future Arctic shipping activities
6. Arctic shipping regulations
6.1 Current international regulations
6.2 Polar Code
7. Arctic Shipping developments and the UK
7.1 Passenger Cruise Voyages
7.2 Export of Natural Resources
7.3 Summary of expected impact development of Arctic Shipping on UK interests
8. Concluding Remarks
9. References

Appendix A: Lloyd’s Register’s involvement with Arctic shipping
Appendix B: Supporting Information – Arctic shipping statistics
Appendix C: Supporting Information – Arctic technology
Appendix D: Ice Class descriptions
Appendix E: Arctic oil, gas and mineral major projects
3. Introduction

3.1 Objective

The objectives of this submission of evidence are:

- To offer supporting data and insights on transit and destination shipping in the Arctic and, in addition, the characteristics of the UK registered Arctic shipping fleet
- To contribute evidence on the technological challenges for future Arctic shipping activities
- To contribute evidence on the regulatory framework that will govern Arctic shipping
- To contribute advice, and views, on Arctic shipping to support consideration of the “UK dimension” by the Select Committee

3.2 About Lloyd’s Register

Lloyd’s Register is a provider of marine classification services, helping ensure that internationally recognised safety and environmental standards are maintained at every stage of a ship’s life.

3.3 Lloyd’s Register’s involvement with Arctic Shipping

Lloyd’s Register publishes and maintains rules for design, construction and survey of ships, including specific rules for ships operating in ice (ice class ships) and ships intended to operate as icebreakers.

Accumulated practical experience with ships designed, constructed and operated for ice navigation forms the basis of our commentary and evidence to The Select Committee on the Arctic. Further detail about Lloyd’s Register’s involvement in Arctic Shipping is included in Appendix A.

4. Arctic Shipping

4.1 Arctic sea ice and “choke” points: transit shipping obstacles

This section presents evidence of the environmental considerations (notably ice cover) relevant to Arctic shipping opportunities.

Recent measurements of the extent of Arctic sea ice, particularly the minimum extent in the summer have been used to suggest that the Arctic may soon become a viable transit route between the Atlantic and Pacific basins, and an alternative to the Panama and Suez canals. Figure 4.1 shows a plot of historical averages, including recent years, of the Arctic sea ice extent. The following points are highlighted:

- 2012 is the lowest ice extent on record, however 2014 data is closer to the 2000’s average
- Increase in variability of ice extent year-on-year
- The variability year-on-year is more significant in the summer time, in the winter there is less variability
- There is still significant ice coverage during the winter season
- Data on sea-ice extent is based on satellite observations that begin in 1979
With respect to the impact of the changing sea ice on shipping, the following observations are offered:

- The trend of less extent of ice in the summertime would suggest that the summer season is increasing for transit of open water ships (i.e. ships not specially designed to operate in ice). In 2013 the ice free season was approximately 40 days along the Russia Arctic transit routes.

- The variability of the summer season will continue to make long-term planning difficult for transits using the Arctic as a commercial shipping route.

- The consistent cover of ice in the winter will remain a hazard and block all but high specification (high ice class) ships transiting outside of the summer season.

Figure 4.2 shows three plots of sea ice extent for the 2014 season. The figure is intended to highlight the significant presence of ice during the mid-winter period. The middle plot in Figure 4.2 indicates the start of the “formal” summer shipping season on the Northern Sea Route. However significant ice remains on the route, effectively blocking entry and exit to the route for all but specialist ice class shipping. The right hand plot in Figure 4.2 shows the lowest ice extent for 2014 and shows open water for the Northern Sea Route, but with ice still keeping all but the shallow southern North West Passage route closed.

- **Left hand plot:** Mid-Winter (30 January)

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93 Based on an analysis of Arctic Sea-Ice Monitor satellite image data.
• **Middle plot: Start of Shipping Season (1 July)**
• **Right hand plot: Lowest ice extent for 2014 (26 September)**

Figure 4.2 illustrates that the ice extent does not retreat uniformly from the shoreline of both the Northern Sea Route and North West Passage. In both sea areas there are also a number of shallow or constrained shipping channels that form “choke points“ where, depending on the year, ice may remain longer than usual and prevent a passage.

A number of the more prominent “choke points” where ice may seasonally prevent a passage from opening are indicated in Figure 4.3:

The eastern end of the Northern Sea route is bounded by Novaya Zemlya, effectively providing two entrances, to the South through the Kara Gate or north of the island. Depending on ice conditions in the Kara Sea either one of these routes may be blocked, thus limiting transit of large vessels.

Towards the Western end of the Northern Sea route the New Siberian Islands present a limited draft passage South (through the Sannikov Strait) or North of the Islands, where the draft is deeper. Here too ice may remain against the islands, preventing access to the Northerly route for part of the navigational season.

![Image showing Arctic shipping routes](image)

**Figure 4.3 Lowest ice extent for 2014 – showing an ice free Northern Sea Route, ice still in North West Passage**

In the Canadian Arctic prevailing wind and current systems within the Arctic basin affect the amount of ice that is forced down through the straits in the North of the Archipelago. Straits such as the McClure can continue to be blocked or chocked by ice well into the summer months, leaving only the potential shallow southern route through Coronation gulf available for shallow drafted ships. These “choke points” will hinder shipping attempting to transit the various Arctic routes and mean that the start and end of the shipping season in the Arctic is unpredictable.

**4.2 Arctic Shipping demands**

*This section presents evidence of the utilisation of the Arctic by commercial shipping*
Shipping in the Arctic can be classified into two broad categories; destination shipping and transit shipping:

1. Transit shipping (or Trans-Arctic traffic) is typically defined as a ship voyage through the Arctic, where the origin and destination ports are outside the Arctic area.
2. Destination shipping is typically defined as a ship voyage or voyages either to or from a destination (port or terminal) within the Arctic area.

### 4.2.1 Transit and destination shipping

Decreased extent of Arctic ice in the summer months has prompted increased interest in using the Arctic as a shorter route for transit traffic between the Atlantic and Pacific basins, as an alternative to the Suez and Panama canals, so-called Trans-Arctic shipping routes. There are three possible passages or routes for Trans-Arctic voyages:

- **North-West Passage** – through the Canadian Arctic, a set of three main routes through the Canadian Archipelago
- **North-East Passage** - through the Russian Northern Sea Route (NSR), defined as “a set of marine routes from the Kara Gate to Bering Strait”
- **Central Arctic Ocean** – the most direct route passing close to the geographic North Pole

Table 4.1 presents various categories of shipping and relates them to the various Arctic areas. Destination shipping occurs in all areas of the Arctic whereas transit shipping occurs either along the Russian Northern Sea Route or through the Canadian North West Passage. The categories of passenger ship cruises and export of natural resources (oil, gas, ore and minerals) in Table 4.1 are elaborated in the following sub-sections as they form the majority of destination voyages and are considered the most significant and relevant when considering commercial shipping in the Arctic.

<table>
<thead>
<tr>
<th>Shipping Type</th>
<th>Within EEZ of Arctic Council coastal state</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Canada</td>
</tr>
<tr>
<td><strong>Destination Shipping</strong></td>
<td></td>
</tr>
<tr>
<td>Passenger Cruise Ships</td>
<td>✓</td>
</tr>
<tr>
<td>Export of Natural resources</td>
<td>✓</td>
</tr>
<tr>
<td>Local re-supply</td>
<td>✓</td>
</tr>
<tr>
<td>Fishing</td>
<td>✓</td>
</tr>
<tr>
<td>Patrol / SAR</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Transit Shipping</strong></td>
<td></td>
</tr>
<tr>
<td>Northern Sea Route</td>
<td></td>
</tr>
<tr>
<td>North West Passage</td>
<td>✓</td>
</tr>
<tr>
<td>Transpolar</td>
<td>✓*</td>
</tr>
</tbody>
</table>

Note: Estimate of EEZ **(exclusive economic zone – typically 200 nautical miles from shoreline)** for illustration purposes only, dependent on UNCLOS** extended continental shelf claims.

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94 Niini, M., Tustin, R.D., Future Possibilities for Trans-Arctic Shipping through the Central Arctic Ocean
95 UNCLOS – United Nations Convention on the Law of the Sea, for further discussion see Section 6
*Actual route of Trans-Arctic crossing may pass through Canada, Greenland, Russia, US, Norway and/or Iceland waters or international waters

**Table 4.1 Arctic Shipping Categories**

### 4.2.2 Passenger Cruise Voyages

Passenger cruise ship voyages have historically been infrequent in the Arctic due to cost and availability of suitably equipped ships. Recently, however, there has been an increase in cruise ship traffic in specific areas (Alaska and West Coast of Greenland), with notable recent interest in cruise voyages in more remote Arctic locations. Cruise ship size (passenger complement) in Arctic regions is also increasing.

Voyages usually involve tourist visits along Arctic coastlines with calls at numerous small ports for day-trips, bringing large volumes of people to remote areas. Figure 4.4 indicates cruise ship traffic patterns in the Arctic for the 2004 season.

![Figure 4.4 Passenger Ship traffic in the Arctic, 2004 season (after Arctic Marine Shipping Assessment, 2009)](image)

Currently the majority of cruise ships are not ice strengthened and typical operations involve avoiding ice (often summer itineraries only). With respect to Passenger cruise ship voyages the following statistics are presented:

- 23 commercial cruise ships have transited the Canadian North West passage between 1984 and 2004 although most of these have been specialist smaller expedition style ships carrying less than 200 people (with some extent of ice strengthening and suitable for operating in ice covered waters).
- Between 2003 and 2008 the number of cruise ship calls at Greenland ports doubled.\(^96\)

Recent news has indicated the prospect of larger cruise ships (1,000+ passengers) operating closer to ice or attempting sailings through the North West Passage:\(^97\)

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\(^96\) Arctic Marine Shipping Assessment, 2009, Arctic Council

4.2.3 Export of Natural Resources

The Arctic is estimated to contain 66 billion barrels of conventional oil and 237 trillion cubic feet of undiscovered conventional natural gas according to the US Geological Survey\textsuperscript{98}. In addition the Arctic area is rich in ore and minerals in particular Nickel and Zinc. Historic, current and near term Arctic natural resources projects are indicated in Table 4.2, with the associated ice capable shipping requirements (open water shipping demands have been omitted). The location of these projects is illustrated pictorially in Appendix E.

<table>
<thead>
<tr>
<th>Arctic Sea Area</th>
<th>Project</th>
<th>Resource</th>
<th>Start-up date</th>
<th>Close-down date</th>
<th>Shipping Season</th>
<th>Ice capable shipping demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>Polaris, (Little Cornwallis Island)</td>
<td>Zinc</td>
<td>1981</td>
<td>2002</td>
<td>3 months</td>
<td>1 icebreaking bulk carrier</td>
</tr>
<tr>
<td></td>
<td>Raglan, (Deception Bay)</td>
<td>Nickel</td>
<td>1997</td>
<td>Current</td>
<td>8 months</td>
<td>1 icebreaking bulk carrier</td>
</tr>
<tr>
<td></td>
<td>Baffinland, (Milne Inlet)</td>
<td>Iron Ore</td>
<td>2015</td>
<td>NA</td>
<td>July-October</td>
<td>3 ice class bulk carriers*</td>
</tr>
<tr>
<td></td>
<td>Baffinland, (Steenbsy Port)</td>
<td>Iron Ore</td>
<td>2020*</td>
<td>NA</td>
<td>Year-Round</td>
<td>10-17 icebreaking ore carriers*</td>
</tr>
<tr>
<td>US</td>
<td>Red Dog (Alaska)</td>
<td>Zinc</td>
<td>1987</td>
<td>Current</td>
<td>July-October</td>
<td>23 ship calls/year</td>
</tr>
<tr>
<td>Russia</td>
<td>Norilsk Nickel Mine (Dudinka Port on Yensei River)</td>
<td>Nickel</td>
<td>1930s</td>
<td>Current</td>
<td>Year-Round since 2005</td>
<td>5 icebreaking container ships</td>
</tr>
<tr>
<td></td>
<td>Prirazlomnoye (Pechora Sea)</td>
<td>Oil</td>
<td>2014</td>
<td>Current</td>
<td>Year-Round</td>
<td>2 icebreaking oil tankers</td>
</tr>
<tr>
<td></td>
<td>Varandey (Pechora Sea)</td>
<td>Oil</td>
<td>2008</td>
<td>Current</td>
<td>Year-Round</td>
<td>3 icebreaking oil tankers</td>
</tr>
<tr>
<td></td>
<td>Yamal LNG (Sabetta Port, Ob River)</td>
<td>Natural Gas</td>
<td>2016</td>
<td>NA</td>
<td>Year-Round</td>
<td>12-16 icebreaking LNG carriers*</td>
</tr>
<tr>
<td></td>
<td>Noviy Port (Ob bay)</td>
<td>Oil</td>
<td>2014</td>
<td>Current</td>
<td>Year-Round from 2016</td>
<td>6 icebreaking oil tankers</td>
</tr>
</tbody>
</table>

*Estimate

\textit{Table 4.2 Table on Export of natural resources requiring ice capable shipping support}

4.3 Arctic Shipping Statistics

\textit{This section presents evidence, in the form of statistics, on how the Arctic is used as a transit shipping route and an overview of environmental considerations (notably ice cover)}

4.3.1 Transit comparisons

The decrease in summer ice extent has led to an increase in summer transit traffic in the Arctic, notably through the Northern Sea Route. There have been very few commercial ship transits through the North West Passage, primarily because of the shorter summer season with open water.

\textsuperscript{98} An estimate of undiscovered conventional oil and gas resources of the world, US Geological Survey, 2012
Table 4.3 shows the first and last Arctic transits in 2012, to indicate the reality of the shipping window for Arctic ships (of any ice class). When compared to regulatory restrictions which, in principle, indicate a longer season of operation the actual season length is illustrative of year-on-year variability of ice conditions, which will constrain and/or prevent ship transits. In summary: even if regulations indicate passage is permissible local ice conditions may prevent transit.

<table>
<thead>
<tr>
<th>Transit Route</th>
<th>Start (Actual)</th>
<th>End (Actual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Sea Route (2012)</td>
<td>July</td>
<td>November</td>
</tr>
<tr>
<td>Northern Sea Route (2013)</td>
<td>July</td>
<td>November</td>
</tr>
<tr>
<td>North West Passage (2012)</td>
<td>No transits</td>
<td>No transits</td>
</tr>
<tr>
<td>North West Passage (2013)</td>
<td>September</td>
<td>October</td>
</tr>
</tbody>
</table>

**Table 4.3 Actual Start and end of the shipping season based on transit data**

Table 4.4 shows the number of transits made through the North West Passage in 2013 was 1, with 0 ships the year before. 2014 will see the first complete transit of a commercial ship unescorted (without icebreaker assistance) through the Canadian Arctic, although the passage is not ice free (the ship undertaking the transit was a Category A, Ice Class PC4 icebreaking bulk carrier). Table 4.4 also shows a comparison of the number of transits (very small numbers of ships transiting) in the Arctic compared with those of the Suez and Panama Canals (very large numbers of ships transiting).

<table>
<thead>
<tr>
<th>Transit Route</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suez Canal</td>
<td>17224</td>
<td>16596</td>
</tr>
<tr>
<td>Panama Canal</td>
<td>14544</td>
<td>14544</td>
</tr>
<tr>
<td>Northern Sea Route</td>
<td>46</td>
<td>71</td>
</tr>
<tr>
<td>North West Passage</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Table 4.4 Number of ships using transit routes**

From Table 4.4 an increase in the use of the Northern Sea Route for transit traffic is shown with a 50% increase in the number of ships making the transit when comparing 2012 and 2013. Table 4.5 presents a comparison of sailing distances between Europe and Asia through the Northern Sea Route, compared with the Suez Canal and Panama Canal. The data indicates that distance savings can be made through the Arctic as far South into Asia as Shanghai, but destinations such as Hong Kong remain shorter through the conventional Suez route. When comparing Routes originating from Asia to markets on the NE Coast of the United States, distance savings can be made using the Northern Sea Route compared against both southern routes, although the actual mileage difference is often not significant.

<table>
<thead>
<tr>
<th>Sailing distance in nautical miles between</th>
<th>Rotterdam (Europe)</th>
<th>Halifax (NE Coast US)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Via Suez Canal</td>
<td>Via NSR</td>
</tr>
<tr>
<td></td>
<td>Via Suez Canal</td>
<td>Via Panama Canal</td>
</tr>
<tr>
<td>Yokohama</td>
<td>11212</td>
<td>7825</td>
</tr>
<tr>
<td>Busan</td>
<td>9907</td>
<td>8490</td>
</tr>
<tr>
<td>Shanghai</td>
<td>9612</td>
<td>8865</td>
</tr>
</tbody>
</table>

99 See Appendix B
100 See Appendix D for description of polar classes
Table 4.5 Distances between major ports by transit route (Icelandic Ministry of Foreign Affairs (2005))

Figure 4.5 shows a comparison of cargo volumes carried through the Suez Canal compared with the Northern Sea Route in 2012 and 2013. The chart indicates that although there has been some increase in cargo volumes carried through the Arctic, however the proportion is very small (*less than 0.2%*) when compared to southerly transit route through the Suez Canal.

![Figure 4.5 Volume of Cargo shipped by Suez Canal and Northern Sea Route](image)

Although some distance savings can be made using the Northern Sea Route as a transit route, the significant distance savings only occur when the transit originates from within Russian waters: Table 4.7 shows the distances from two major oil and gas projects in prospect in the Russian Arctic. The Yamal project will see a significant export of gas year around from within the Northern Sea Route itself, whilst Shtokman (although the project is currently on hold) would see shipping requirements from North of Novaya Zemlya. On-stream production from two fields in the Russian Pechora Sea (West of the Kara Sea and just east of eastern boundary of the Northern Sea Route), Varandey and Prirazlomnoye are similar distances from the markets in Table 4.7 as Shtokman.

<table>
<thead>
<tr>
<th>Sailing distance in nautical miles between</th>
<th>Shtokman (and Pechora Sea Oil)</th>
<th>Yamal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Via Suez Canal</td>
<td>Via NSR</td>
</tr>
<tr>
<td>Yokohama</td>
<td>12640</td>
<td>5800</td>
</tr>
<tr>
<td>Busan</td>
<td>12400</td>
<td>5930</td>
</tr>
</tbody>
</table>
4.3.2 Transit limitations

One limitation on all transit routes between ocean basins which pass through shallow water, either channel water clearance or in the case of the Panama Canal lock sill clearance, is the allowable draft of the ship. Table 4.8 indicates these draft limitations.

It can be seen that once the new Panama locks are inaugurated both Arctic transit routes will have shallower draft restrictions on their inner passages when compared to transit through the Panama or Suez Canals. As indicated in Section 4.1 northerly routes in the Russia Arctic are available, however the seasonal window to access these routes varies with the ice cover year-on-year.

Furthermore it should be noted that, particularly in the Canadian Arctic, hydrographic charts of designated routes have limited data / accuracy. Although this poses little challenge when the water is ice free, when ice covered it is typical for ships to follow open water leads and take the path of least resistance in ice – a lack of reliable charting therefore restricts operation where deviation off designated routes to avoid harsh ice may result in the ship grounding.

<table>
<thead>
<tr>
<th>Transit Route</th>
<th>Maximum Draft</th>
<th>Maximum Beam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suez</td>
<td>20.1m</td>
<td>50m</td>
</tr>
<tr>
<td>Panama</td>
<td>12.04m</td>
<td>32.31m</td>
</tr>
<tr>
<td>Panama (new locks)</td>
<td>15.2m</td>
<td>49m</td>
</tr>
<tr>
<td>North West Passage*</td>
<td>14m</td>
<td>NA</td>
</tr>
<tr>
<td>Northern Sea Route</td>
<td>12.8m / 15m+</td>
<td>30m</td>
</tr>
</tbody>
</table>

Table 4.8 Sea Route Size Limitations

Detailed notes on Table 4.8 data are provided as follows:

- 12.8m draft is the maximum through the Sannikov strait in the Northern Sea Route. A more northerly route (north of the New Siberian islands) allows for deeper drafts, but with a more limited window of ice free operation
- The North West Passage is limited to 14m, but surveys of the passages are incomplete – therefore course deviations off the sounded channel (necessary for operation in ice) increase risk of grounding
- Northern Sea Route beam limitations are related to the maximum width of the supporting icebreaker channel. Recent voyages of wider ships have taken place (in open water / light ice conditions) indicating that this requirement may be relaxed for summer season transits where close icebreaker escort is not required

4.4 World and UK Fleet Statistics

This section presents evidence, in the form of statistics, on the volume and type of shipping in the Arctic and the available UK flagged fleet suitable for operation in the Arctic

4.4.1 The world ice classed and Arctic fleet

Section 4.1 indicates that, with year-on-year variability, the ice free season in the Arctic is relatively short. Outside of the ice-free season ships require strengthening of the hull and machinery in order to operate in ice without damage (ice class). However, the number of ships in the world fleet (500 GRT or greater) that are ice classed is relatively small. Figure 4.6

102 Distances extracted from Arctic Energy Shipping Perspectives, Sovcomflot presentation to the Arctic Passion Seminar, 2011
103 See further description and definition of ice class and ice strengthening in Appendix D
Lloyd’s Register – Written evidence (ARC0048) indicates that about 8,600 ships, representing approximately 15% of the world fleet (500 GRT or above), have some extent of ice strengthening.\(^{104}\)

**Figure 4.6 Ice class and Arctic ships as a % of world fleet**

However, of these ships only about 6% (about 500 ships) could be considered Arctic cargo ships or icebreakers (Category A or B ships under the Polar Code), as Figure 4.7 illustrates. The data indicates there are a very small number of specialist ships capable of operating in Arctic ice-covered waters: We estimate about 120 Category A ships and 380 Category B ships.

**Figure 4.7 Arctic ships and icebreakers as a % of the world ice classed fleet**

**4.4.2 The UK flagged ice class fleet**

The fleet of UK flagged ships of 500 GRT and above totals approximately 800 ships. Figure 4.8 indicates the percentage of these ships which are ice classed. Figure 4.9 indicates the breakdown of these ice classed ships by the ice classed assigned: The UK fleet consists of an estimated 119 ice classed ships, the majority of which are the lowest ice class (1C). The UK fleet consists of an estimated 8 ships that could, based on structural equivalence, be assigned a Category B under the Polar Code and potentially suitable for independent summer operations in Arctic waters with ice present.

\(^{104}\) Data sourced from IHS Maritime Seaweb database
The data in Figure 4.8 and Figure 4.9 shows that the number of UK flagged ships capable of operation in the Arctic outside of the ice-free season is small. Table 4.9 shows the top ten (by ship number registered under UK flag) ship owners and the number of ice class ships in their fleet: The largest fleet is that of the UK government as a number of Royal Navy auxiliary vessels are assigned an ice class (typically Ice class IC). It should be noted that the statistics presented include only ships registered under UK flag and does not include UK Crown Dependencies (Isle of Man and Channel Island) or Overseas Territories registered ships. Consideration has not been given in this report to UK-managed ships which are flying foreign flag. Consequently the contribution, influence and participation of UK shipping in the Arctic is potentially larger than indicated in this overview of the UK registered fleet only.

<table>
<thead>
<tr>
<th>Ship Owner</th>
<th>Ice Classed Ships</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom Govt</td>
<td>11</td>
</tr>
<tr>
<td>Stena AB</td>
<td>8</td>
</tr>
<tr>
<td>Claus-Peter Offen Reederei</td>
<td>8</td>
</tr>
</tbody>
</table>

---

105 See Shipping Fleet Statistics, Department for Transport
Lloyd’s Register – Written evidence (ARC0048)

Knutsen OAS Shipping AS 6
Stolt-Nielsen USA Inc 6
Imperial Shipping Ltd UK 4
Ellingsen Shipping Group 4
Cairisbrooke Shipping Ltd 4
Andrew Weir Shipping Ltd 4
Genzina AS 4

Table 4.9 Top ten UK registered ice-class ship owners

5. Arctic Technology
5.1 Technological advancements to support expanded shipping activities
This section presents evidence on key aspects of technology relevant to today’s Arctic shipping

5.1.1 The challenge of ice-going ship design
The main principle for all ice-going ship design is to minimise the amount of power required to break ice, while maintaining efficiency of operation in an open seaway. The fundamental dichotomy being that efficient icebreaking requires a relatively flat, full bow shape while an efficient bow for open water efficiency and sea-keeping requires a much finer bow form and hull lines. Higher engine powers are required for ships operating in ice because of the added friction between the ship and the ice and the momentum required to push the ship through ice.

5.1.2 The development of efficient ice-going ships
A detailed description on the development of efficient ice-going ships is provided in Appendix C. The principle developments can be summarized as follows:
- Prior to 1970s ice-going ship design was experienced based without engineering principles and practice for performance predictions
- The introduction of ice model basins in the 1970s and 1980s established rigorous methods of predicting ice-going performance and consequently saw significant improvements in hull form (ship shape) design of ice-going ships
- Advances in hull form design allowed for very efficient icebreaking forms, but at the expense of open water performance (flat, full icebreaking bows typically perform poorly in open water with higher open water resistance and fuel consumption, as well as degraded sea-keeping characteristics e.g. being prone to bow slamming in open water with increased discomfort to the crew).
- After this period of optimisation the efficiency of ice-going hull forms has now leveled out
- The introduction of azimuth thruster\textsuperscript{106} propulsion in the mid-1990s allowed for increased icebreaker efficiency (power and manoeuverability) without the need for extreme hull form shapes
- Use of azimuth thrusters as a means of propulsion for icebreakers has become almost standard since the 2000s, allowing for a more effective balance between open water and ice-going power demands, although they are yet to be operated in extreme high-Arctic, thick ice conditions
- After an initial period of optimisation the efficiency of ice-going ships equipped with azimuth thrusters has also now leveled out
Two approaches currently exist for efficient ice-going ship design:
- High-powered shaft line ships with optimised icebreaking bow forms

\textsuperscript{106} See Appendix C for explanation of Azimuth thrusters and icebreaking efficiency
Azimuth-thruster equipped ships with moderate icebreaking bow forms
In figure 5.1 a number of icebreaking offshore support vessels are compared, all of which have similar performance points in ice (the ability to break 1.5m thick ice at 2 knots): Bollard Pull (thrust)/Beam represents a measure of efficiency, the lower the value the more efficient the ship is. The purpose of Figure 5.1 is to illustrate two key developments of ice-going ship efficiency:

- The first period between 1970s and 1990s involved optimisation of hull form shape for efficient ice operation.
- The second period, from the mid-1990s to present, involves optimisation of the use of azimuth thrusters for efficient ice operation.

The blue line, shaft line icebreaker designs, shows a decreasing bollard pull/beam value over time. This represents an increase in hull form effectiveness, with the final experimental concepts in the early 1990s being very efficient in ice (but with poor open water performance). In the early 1990s a hiatus in icebreaker building occurred. The azimuth thruster concept was introduced to icebreakers in 1993, with some optimisation and learning from the first cases contributing to increases in efficiency in the 2000s.

![Illustrative Icebreaker Efficiency over time](image)

**Figure 5.1 Illustrative comparison of increasing icebreaking efficiency over time (offshore support icebreakers)**

The key conclusion from Figure 5.1 is that ice going ship development, unlike open water ship optimisation, has not been continuous and incremental, rather it has had step changes based on technology advances. It is to be noted that these step changes in technology have not been completely substitutional but rather complementary, with advances in icebreaking technology allowing for greater options and configurations of ship shape and propulsion configuration to suit specific operational profiles and needs: Efficient icebreaking ships equipped with shaft lines (not azimuth thrusters) continue to be built and operate effectively.

### 5.2 Technological challenges for future Arctic shipping activities

*This section presents evidence, in the form of data and derived opinions from recent Arctic shipping projects, on some of the technological challenges for commercially viable shipping in the Arctic*

#### 5.2.1 Uncertainty of ice loading for large ships

The science concerning failure of ice (ice mechanics) and its use for engineering applications is still relatively immature and developing. Engineers and designers of ships instead have had to typically rely on semi-empirical methods, calibrated with full scale measurements of ship’s
structure exposed to ice, to determine design loads in order to dimension and size the ship’s structure to prevent failure when operating in ice. Although advances are being made in laboratory testing of ice failure, a significant reliance is still made on full scale testing data. It should be noted that full scale testing of ships in ice is exceptionally costly and consequently a limited data set is available for calibrating design loads.

Classification societies, such as Lloyd's Register, publish rules which prescribe the strength of ships for navigating in ice depending primarily on the thickness (and type) of ice. The IACS Polar Class Rules represent the latest scientific and engineering thinking on dimensioning ship structures in ice. These rules have been calibrated with the available data sets of full scale ship operations in ice. However, data sets used for calibration are from small icebreakers and moderate sized icebreaking cargo ships. For larger ships outside the calibration range the rule formulations (for design ice pressures which are used to define ice loads) are necessarily conservative, to account for uncertainty of ice loads on larger ships.

Recent developments in Arctic shipping have seen a considerable increase in the size of icebreaking cargo ships, primarily to serve natural resource export projects, where economies of scale encourage large ship operations in ice. As the ship size increases, and as the Arctic is opened up to further projects which require ships to operate in thicker ice (or without icebreaker escort), the design loads increase exponentially due to uncertainty of ice loading. As the design load increases more steel structure is designed into the ship to prevent damage from conservatively (because of uncertainty) derived ice loads. The consequence of this increasing design load is an increase in hull lightship weight due to steel structure and a reduction in overall hull cargo carrying capacity. This makes the ships less efficient to operate and more expensive to build.

In relatively thin thicknesses of ice the effect of ice load uncertainty is not significantly pronounced. However in relatively thick thicknesses of ice the effect of ice load uncertainty is pronounced. This uncertainty can be considered a significant technological hurdle that will require more full scale testing of large ships in relatively thick ice.

Figure 5.2 shows a plot of the steel weight of a number of recent large cargo ship projects. The curve indicates the actual (exponential) increase in steel weight for ice strengthening with an increase in ship’s ice-going capability (as defined by permitted level ice thickness for ship operations). The straight line on the chart is intended to represent a desired, or ideal, situation where refinement in the understanding of ice loads on larger ships may, in the future, yield a more optimal structural design of reduced steel weight.
5.2.2 Efficient ship structures for large Arctic ships

The structural design of Arctic ships has not changed significantly since the mid-1980s. Structural design practice has followed a “tried and tested” approach, primarily because of the uncertainty regarding the ice load (as described in 5.2.1). However, as ship size has increased, the same approaches to dimensioning structure have been retained. As Arctic ships increase in size, and as the ice loads associated with operating these large ships in thicker ice remain relatively conservative, the applicability of current design practice is reaching its limit. The nature of ice load is fundamentally different to that of wave loading and approaches to structural design of large Arctic ships have not been explored fully to allow for the most efficient arrangement and design to be adopted. The reduction in steel weight required for efficient Arctic ship design as shown in Figure 5.2 can therefore be considered to be a function of two required advances in Arctic technology:

1. Greater certainty of ice loads on larger ships (5.2.1); and
2. Improvements in structural design for large Arctic ships

Improvements in structural design are considered to encompass not only new configurations but also use of advanced materials. Current Arctic ship designs are utilising high strength steels up to the limit of what may be considered standard steel types in the shipbuilding industry. In order to address the need to develop more efficient and lighter structures to resist ice loads for larger ships new materials may have to be considered.

5.2.3 Competitive Arctic Ships

For some ship operations it may make economic sense, voyage for voyage, to use the Arctic as a transit route. But, as the previous sections have shown, there is only a small window in the summer months when open water vessels can operate, either independently or with icebreaker escort. Outside of this window, ships need an ice class, meaning extra power and a change in hull form shape, to enable operations in ice. Such vessels are not as fuel efficient as open water designs because hull form shape for icebreaking compromises hull form shape optimised for efficiency in open water.
Experience with higher first year ice-class ships (Finnish-Swedish ice class IA and IA Super) that are seasonally trading in the Baltic is that they are uncompetitive from an operating cost perspective when compared with modern open water ships that are optimized for fuel efficiency. Design for ship fuel efficiency in open water with satisfactory ice going performance is a significant challenge for ship designers to achieve an optimal balance of these two conflicting requirements for ship design.

At present there is a widening gap in performance between ice-going and open water ships as fuel and energy efficiency improvement is driving and dominating the development of a new generation of open water optimised ships. The drive for fuel and energy efficiency is expected to continue in future, and is also being further supported by regulation for the mitigation of greenhouse gas emissions from ships, such that the performance gap between open water ships and ice class ships will widen further in future. Figure 5.3 shows a plot of the installed main engine power for small oil product tankers (with the same cargo carrying capacity) delivered from one shipyard over the last seven (7) years. The plot shows decreasing main engine power over time.

The decrease in engine power, shown in Figure 5.3, is possible because of energy saving (optimisation) methods that have been employed to reduce the power such as, for example, a de-rated lower power and slower RPM engine with a larger propeller and improved hydrodynamic efficiency.

Figure 5.4 shows the same data (from Figure 5.3) compared with the same ship type (small oil product tankers) with an ice class (ice class IA). It shows that in recent years the efficiency of ice going ships (the power required) has remained stable. Comparing the two plots the diverging trend is apparent, where open water ships are becoming more efficient due to energy saving measures than ice class ships i.e. the operating cost penalty for an ice classed ship, when compared with a modern fuel efficient open water ships, is increasing.
Figure 5.4 Comparison of installed engine power in MR Tankers (Ice class IA and no ice class)
The challenge facing owners and designers of ice class ships is how to balance the conflicting design characteristics of open water efficiency (and reduced operating cost) with required ice going performance (and increased operating cost).
If owners need an ice class for trading seasonally anywhere in the Arctic, the question remains: what are they going to do with their ships for the rest of the year? If they want to trade the whole year round, they may have to look at an extreme ice-breaking form and propulsion configuration that is only economical for particular projects or particular routes, where the ice-going performance can be optimized for exact conditions.

6. Arctic Shipping Regulations
6.1 Current international regulations
This section presents evidence on the current status of regulations relevant to Arctic shipping. In accordance with the UN Convention on the Law of the Sea UNCLOS article 234 authorizes coastal states within the limits of the exclusive economic zone (200 nautical miles from the coastal baseline) to adopt and enforce non-discriminatory laws and regulations for prevention, reduction and monitoring of marine pollution from vessels operating in areas covered with ice. Of the Arctic coastal states two countries have established national requirements that regulate shipping from different perspectives: Canada’s regulations focus on pollution prevention from ships; while the Russian Federation requirements are more safety and traffic related. Both of these countries’ requirements set out seasonal limitations on ship operations in Arctic areas under their jurisdiction, primarily based on the ice strengthening standard (ice class) assigned to the ship. Table 6.1 indicates the current relevant shipping regulations for the Arctic.

<table>
<thead>
<tr>
<th>Arctic Sea Area</th>
<th>Significant presence of ice</th>
<th>Shipping regulations for control of traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>✓</td>
<td>Merchant Shipping Code of the Russian Federation and Requirements of the Northern Sea Route Administration</td>
</tr>
<tr>
<td>Canada</td>
<td>✓</td>
<td>Canada Shipping Act, Arctic</td>
</tr>
</tbody>
</table>

51
6.2 Polar Code

This section describes the current status of the Polar Code and its relevance to Arctic Shipping. Section 6.2.1 presents the status and commentary on the Polar Code as of October 2014, when this evidence was first submitted. Section 6.2.2 provides an updated status as of January 2015, following finalisation of the Code at the IMO in November 2014.

6.2.1 Polar Code Status October 2014

Work began in developing mandatory standards for Polar Shipping in 2009, with finalisation of the draft text anticipated in late 2014. The entry into force date is anticipated to be 1st January 2017.

The Polar Code is intended to supplement SOLAS\(^{107}\) and MARPOL\(^{108}\), covering additional aspects of ship design and construction for international ships operating in the Polar Regions. In parallel, amendments to the STCW (Standards of Training, Certification and Watchkeeping) Code have included provision for training of seafarers on ships operating in Polar Regions. The technical content of the Polar Code mirrors best practices already adopted by experienced ship owners, ship designers and ship builders, principally:

- The effects of sea ice: requirements for ice Class, subdivision and damage stability
- The effects of icing: requirements for intact stability (ice accretion) and de-icing measures to ensure operability of equipment exposed to icing
- The effects of low temperature: requirement for operation of essential systems and equipment and provision of suitably habitable environment for the crew
- The effects of high latitude
- The effects of remote operations

It is the intention of the Polar Code to provide an international standard for shipping in Polar regions – to which owners may specify their ships, designers and shipyards may build their ships and insurers / ship charters may evaluate more accurately the suitability (and the risk) of ships engaged on Polar voyages. However, in the near future it is likely that national regulations will be retained, primarily because:

- as an international standard, not all local requirements will have been addressed
- some Arctic states will retain stricter standards / requirements above a minimum international standard for some aspects

The Polar Code is nearing finalisation. At present, one key issue with respect to the Polar Code that remains relates to ship limitations: The majority of other international shipping regulations set minimum standards for international trading. However, because of the diversity of environmental conditions within the Polar areas, setting a minimum standard (of construction and environmental protection) is a challenge as overly onerous requirements will affect the economics of operating ships safely. Consequently it is the intention that the Polar

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\(^{107}\) International Convention for the Safety of Life at Sea, 1974 as modified by the 1988 SOLAS Protocol

Code requires ship specific limitations to be recorded on the Polar Ship Certificate (specific to the ship and to the environmental conditions – primarily ice conditions and temperature – which the ship will operate in). However, although some have advocated a strict limit-based system (what some have termed a “strong Polar Code”\textsuperscript{109, 110}), the current Polar Code lacks the mechanism through which to set and enforce such limits. Primarily this is because of the technical complexity of developing a system that is based on seasonal and variable ice conditions but also because such a system would necessarily have to reconcile with (or at least accommodate) current national shipping regulations.

The draft Polar Code is to be further refined at MEPC67 in October 2014 (Marine Environment Protection Committee – IMO’s committee on preventing pollution from shipping) and MSC94 (IMO’s Maritime Safety Committee) in November 2014. The following paragraph presents commentary that is relevant to the draft Polar Code as of September 2014. Developments at the IMO leading to the completion of the draft Code text (anticipated in November 2014) may affect the relevance of the following commentary and should be validated against the final draft code text:

Outstanding issues relating to the certification and limitations for operation in Polar waters will be discussed at MEPC67 and MSC94. Proposals developed by IACS and a number of Arctic states to introduce a system for linking ice conditions with ice class – effectively a risk based system for determining if a ship can operate in specific ice environments based on its structural strength and survivability – are to be presented.\textsuperscript{111} However, it should be highlighted that such a system is only proposed as guidance and not as a mandatory traffic restriction tool. The implications of this are that there is still no common mandatory standard for regulating the passage of ships in ice areas, even with the onset of the Polar Code – it will be up to coastal states, flag states, insurers and operators to require/use an appropriate system for determining in what conditions ships may operate. At the outcome of MSC94 in November it is anticipated that this issue will be concluded.

6.2.1 Polar Code Status January 2015

The Polar Code text is now complete. The entry into force date of January 1\textsuperscript{st} 2017 has been confirmed. As of January 1\textsuperscript{st} 2017 all ships operating in Polar Waters (above 500 grt) will be required to carry a Polar Ship Certificate.

Although the Polar Code text was completed at MSC94 in November, the key outstanding issue – relating to a standard system/approach for determining limitations for operating in ice – remained incomplete: There was insufficient time at MSC94 to consider the proposal of such a system (POLARIS – Polar Operational Limit Assessment Risk Indexing System) as submitted by IACS for inclusion in the Polar Code. Instead a further Correspondence Group, reporting to MSC95 (which will meet in June 2015) was set up to consider POLARIS, and other methodologies for assessing operational limitations, as a IMO Circular. A reference was included in the final Polar Code text to “Guidance developed by the organization” as a means to link the expected IMO Circular developed by this correspondence group with the Polar Code itself. It is anticipated that the Correspondence Group outcomes will include a generic set of requirements for methodologies to assess (and set) ship limitations with respect to ice

\textsuperscript{109} The case for a strong polar code, Friends of the Earth international, 2011


\textsuperscript{111} MSC94/3/7 POLARIS – Proposed system for determining operational limitations in ice
operations as well as an example of such a methodology (which is likely to be based on the POLARIS proposal from IACS submitted at MSC94).

Therefore, although the Polar Code text is now complete, there is still ongoing work at the IMO to refine procedures, methodologies and guidance that will enable the Polar Code to be implemented consistently. It is anticipated that this will be complete by the conclusion of MSC95 in June 2015. Until this work is complete there remains a certain level of uncertainty in terms of how ship-owners and ship designers are to prepare for the 1st of January 2017 entry into force date.

7. Arctic Shipping developments and the UK

This section presents evidence and offers advice, and views, on the influence of Arctic shipping developments on the UK to support the consideration of the “UK dimension”.

The two categories of Arctic shipping are considered most significant and relevant as described in the previous sections, namely: Passenger Cruise Voyages (section 4.2.2) and Export of Natural Resources (section 4.2.3). Advice, and views, are offered on the potential for a “UK dimension” from an expansion of Arctic shipping in these two shipping categories.

7.1 Passenger Cruise Voyages

Although passenger numbers in Arctic cruises are still relatively small (about 50,000 passengers in 2012) the number passenger cruise voyages to the Arctic is, however, increasing. UK & Ireland citizens are the second most numerous passengers on cruise ships with just over 8% of total cruise passenger numbers. See global passenger data in Table 7.1 from Cruise Line Industry Association (CLIA) statistics from 2013. Furthermore, Southampton is one of five European ports in the top 20 ports of embarkation for cruise passengers globally (the others being Barcelona, Copenhagen, Genoa and Venice).

<table>
<thead>
<tr>
<th>Country</th>
<th>2013 Passengers</th>
<th>Global Passenger Share</th>
<th>5 Year % Change</th>
<th>2013 Passenger Source Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>11,016</td>
<td>51.7%</td>
<td>15.1%</td>
<td>1</td>
</tr>
<tr>
<td>UK &amp; Ireland</td>
<td>1,719</td>
<td>8.1%</td>
<td>16.4%</td>
<td>2</td>
</tr>
<tr>
<td>Germany</td>
<td>1,637</td>
<td>7.7%</td>
<td>80.5%</td>
<td>3</td>
</tr>
<tr>
<td>Italy</td>
<td>860</td>
<td>4.0%</td>
<td>26.1%</td>
<td>4</td>
</tr>
<tr>
<td>Australia</td>
<td>760</td>
<td>3.6%</td>
<td>130.3%</td>
<td>5</td>
</tr>
<tr>
<td>Canada</td>
<td>734</td>
<td>3.4%</td>
<td>1.3%</td>
<td>6</td>
</tr>
<tr>
<td>Brazil</td>
<td>732</td>
<td>3.4%</td>
<td>84.8%</td>
<td>7</td>
</tr>
<tr>
<td>Spain</td>
<td>600</td>
<td>2.8%</td>
<td>20.7%</td>
<td>8</td>
</tr>
<tr>
<td>France</td>
<td>520</td>
<td>2.4%</td>
<td>67.7%</td>
<td>9</td>
</tr>
<tr>
<td>Scandinavia &amp; Finland</td>
<td>350</td>
<td>1.6%</td>
<td>184.6%</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 7.1 – Top Ten CLIA Cruise Passenger Source Market Overview (2013 Passenger estimates (000’s))

Considering the above, there may be direct economic and/or employment benefits to the UK from an increase in Passenger Cruise Voyages in the Arctic in the case of one or a combination of the following:
1. UK registered cruise ships operating for Passenger Cruise Voyages in the Arctic
2. UK ports of embarkation for Passenger Cruise Voyages in the Arctic
3. UK domiciled specialist tour and expedition cruise operators

Considering UK & Ireland passenger numbers, and port of embarkation statistics, it could be
anticipated that increased numbers of UK & Ireland citizens will travel to the Arctic for Passenger Cruise Voyages. Furthermore some of the cruise ships employed for these voyages may also fly the UK flag. A UK port of embarkation is quite feasible and probably for Passenger Cruise Voyages to the Arctic as northern UK ports are closer in voyage distance to Arctic cruising destinations than most other popular European ports of embarkation. Finally it is also quite conceivable that specialist Arctic tour and expedition cruise companies may be established in the UK & Ireland to access a potentially large (the 2nd largest global share of cruise passengers) pool of cruising customers.

7.2 Export of Natural Resources
Direct economic and/or employment benefits to the UK from an increased export of natural resources from the Arctic could be anticipated in the case of one or a combination of the following:

1. UK import of natural resource cargoes from the Arctic
2. UK registered commercial ships employed to load natural resources from ports in the Arctic for export
3. UK port trans-shipment of natural resource cargoes from the Arctic

Depending upon the terms of the agreements (between the cargo buyer and cargo seller) there is a possibility that UK buyers of natural resources from Arctic projects could be responsible for the provision of specialist Arctic shipping. Such a scenario (the cargo buyer providing the shipping) is quite common for LNG cargoes where long term agreements for the purchase of large volumes of LNG cargo (i.e. multiple shipments per year) are essential to justify huge investments in infrastructure, e.g. land side terminals and gas processing plant. The LNG cargo buyer in such a scenario is typically an international oil company and dedicated shipping is often purpose designed and built for long term employment. This is possibly the most realistic (albeit highly dependent on attractive commercially terms for any LNG to be imported from the Arctic) future scenario that we can conceive where UK registered commercial ships might be employed to load natural resources from ports or terminals in the Arctic, that is, an international oil company buying LNG cargoes under a long term agreement from a natural resource project in the Arctic, and employing dedicated UK registered shipping for import of the LNG into the UK.

A second scenario of natural resource imports could be envisaged where Arctic minerals are imported to the UK on dedicated, purpose designed and built, high specification Arctic commercial ships. This is another realistic (albeit again highly dependent on attractive commercially terms for any minerals imported from the Arctic) future scenario that we can conceive where UK registered commercial ships might be employed to load natural resources from ports in the Arctic, that is, a UK importer buying Arctic mineral cargoes under a long term agreement from a natural resource project in the Arctic, and employing dedicated UK registered shipping for import into the UK.

A final scenario of a UK port being developed for trans-shipment of natural resource cargoes from the Arctic could also be a future Arctic shipping scenario with direct economic and/or employment benefits to the UK. As an example Yamal LNG (a project for exporting gas from Russia’s Yamal Peninsular) has reached an agreement in April 2014 for a Belgian LNG receiving terminal at Zeebrugge to act as a winter season LNG trans-shipment port (transfer of LNG...
cargoes from dedicated Arctic LNGs for the Yamal LNG trade to conventional LNG ships employed in world-wide trade).

In addition to the above scenarios for operations of Arctic shipping to/from UK ports and/or on UK registered ships there are possibilities for additional accumulated benefits to the UK from an increase in Arctic shipping through the provision of services by specialist service providers and specialist equipment and materials suppliers based in the UK to global shipping entities involved in Arctic shipping.

This may include, but is not restricted to, the following:

1. Specialist ship management services
2. Insurance and underwriting service provision, such as, for example specialist insurance for operations in Arctic seas provided by London based underwriters
3. Technical services providers, such as, for example Classification and Certification services from Lloyd’s Register
4. Specialist suppliers of equipment and materials, such as, for example UK suppliers of specialist abrasion resistant external hull coatings for operation in ice

Notwithstanding the beneficial possibilities of future Arctic shipping for the UK, as described above, it should however be noted that Arctic shipping volumes are currently exceptionally small, as described in transit statistics in section 4.3.1. Arctic shipping is then small scale (when cargo volumes are compared with global shipping volumes) and it is a niche activity undertaken by a small number of specialist shipping providers. Currently the main providers of Arctic shipping are entities that reside within the Arctic state of the shipping project or Arctic destination ports, for example, Fednav of Canada or Sovcomflot of Russia.

Within the UK the only specialist shipping providers, albeit for Antarctic destinations (not Arctic destinations), are government owned operations for science i.e. British Antarctic Survey or security i.e. Royal Navy Ice Patrol. Other than government Antarctic operations there are UK based staff with some Arctic shipping experience and knowledge in the marine operations and assurance staff of International Oil Companies such as, for example, Shell and BP. In addition there may possibly be some Arctic shipping experience in UK based ship owner and ship management companies.

Overall though the extent of Arctic shipping experience and knowledge within the UK is both difficult to assess and quantify, and will also be difficult to sustain if current low volumes of Arctic shipping prevail in future. It should, however, be noted that a similar situation prevails in most other countries with interests in development of Arctic shipping (even for some states with Arctic territorial waters).

Arctic shipping technology providers, i.e. specialist ship designers, ice model basins and specialist equipment suppliers, typically supply services globally for Arctic shipping projects. Currently there are only a very small number of these specialist technology providers, most notably in Finland where a small cluster of Arctic shipping technology providers exists. Note that none of these providers is a UK based entity. In the case of dedicated Arctic shipping, to be purpose designed and built for UK trade, it is anticipated that the employment of existing Arctic shipping technology providers (outside of the UK) would be necessary.

7.3 Summary of expected impact development of Arctic Shipping on UK interests

In summary on the “UK Dimension” of any increase in Arctic shipping:

1. There may be direct economic and/or employment benefits to the UK from an increase in Passenger Cruise Voyages in the Arctic
2. There may also be direct economic and/or employment benefits to the UK in the case of import to the UK of natural resources from the Arctic

Although there is some Arctic shipping experience and knowledge within the UK it is difficult to assess and quantify, and will also be difficult to sustain if current low volumes of Arctic shipping prevail in future. Any initiative, as part of a “UK dimension” of Arctic shipping, may need to consider co-operation with other countries with interests in development of Arctic. Such an approach is considered to be more realistic than consideration of any UK national initiative for Arctic shipping.

8. Concluding Remarks
The objectives of this submission of evidence to the House of Lords Arctic Committee are:

- To offer supporting data and insights on transit and destination shipping in the Arctic and, in addition, the characteristics of the UK registered Arctic shipping fleet.
- To contribute evidence on the technological challenges for future Arctic shipping activities
- To contribute evidence on the regulatory framework that will govern Arctic shipping
- To contribute opinions on the “UK Dimension” of any increase in Arctic shipping
- To contribute advice, and views, on Arctic shipping to support consideration of the “UK dimension” by the Select Committee

Considering each objective in turn:

**Supporting data and insights on transit and destination shipping in the Arctic**

Key points:

1. Very small number of ships use Arctic transits for voyages between ocean basins (i.e. Pacific and Atlantic basins) as an alternative shipping route to transits through the Panama or Suez canal
2. Shipping in the Russian Arctic is likely to increase, but will be mainly export shipping for dedicated natural resources projects. Transit of commercial ships through the Russian Arctic is likely to occur during the summer season only
3. The UK registered ice-classed fleet is small, with 119 ice classed ships, and just 8 ships potentially suitable for transiting the Russian Northern Sea Route independently in an average summer season

Background, or driver, of key points:

- Even with a reduction in sea ice extent, ice conditions will remain variable and will continue to be a risk to non-specialized shipping in all but the summer season. Variability of Arctic sea-ice conditions annually and year-on-year will continue, limiting the operational season and opportunities for liner traffic to use Arctic transits as an alternative to current trade routes
- Draft (ship-size and cargo carrying capacity) restrictions due to shallow waters in much of the Arctic reduce the possibilities for large ships to navigate in the Arctic and as a consequence reduces achievable economies of scale in comparison with other shipping routes for movement between ocean basins (i.e. in comparison with transits through the Suez and Panama Canals)
- Statistics presented include only ships registered under UK flag and do not include UK Crown Dependencies (Isle of Man and Channel Island) or Overseas Territories registered ships. The contribution, influence and participation of UK shipping in the Arctic is potentially larger than indicated in this overview of the UK registered fleet only.

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112 See Shipping Fleet Statistics, Department for Transport
Contribute evidence on the technological challenges for future Arctic shipping activities

Key Points:
1. Technological challenges remain for efficient Arctic shipping with a significant build and operating cost premium associated with current generation Arctic capable ships
2. A combination of uncertainty of ice loads, and the development of much larger Arctic ship designs than hitherto, may lead to Arctic ships that are uneconomic in operation with reduced cargo carrying capacity and excessive hull structural steel-weights
3. Dedicated, or specialised, ships designed for year round ice-going navigation, even those enhanced only for seasonal navigation in light ice conditions, are uncompetitive in build and operation costs when compared with open water shipping

Background, or driver, of key points:
- A fundamental driver of hull form design for ice-going ships is to minimise the amount of power required to break ice. To maintain efficiency of operation in an open sea there is a fundamental dichotomy in that efficient icebreaking requires a relatively flat, full bow shape while an efficient bow for open water efficiency and sea-keeping requires a (much) finer bow shape.
- A limited data set, from full scale measurements of ice loads on ships in ice, is available for calibrating and determining design loading of ships due to hull-ice interaction. A combination of uncertainty of ice loads, and the development of much larger Arctic ships than hitherto, is possibly leading to excessive conservatism in design loads and structural design of Arctic ships. This is shown in a plot of the steel weight of a number of recent large cargo ship projects. The curve indicates the actual (exponential) increase in steel weight for ice strengthening with an increase in ship’s ice-going capability (as defined by permitted level ice thickness for ship operations). The straight line on the chart is intended to represent a desired, or ideal, situation where refinement in the understanding of ice loads on larger ships may, in the future, yield a more optimal structural design of reduced steel weight.
- The trend for energy efficiency for open water ships, coupled with relatively high installed power requirements for Arctic and ice class ships, is leading to a divergence in hull performance such that Arctic and ice class ships are becoming (even more) uncompetitive from consideration of build and operating costs when compared with open water ships. This is shown in trend comparison for installed main engine power between ice-going, and open water, designs of small oil product tankers – where higher installed engine power directly relates to capital cost at build and operating cost (i.e. fuel oil consumption) in service.
Figure 8.1: Increase in steel weight compared with icebreaking capability for large cargo ships

Figure 8.2: Comparison of installed engine power in small product tankers (ice class 1A and no ice class)
Contribute evidence on the regulatory framework that will govern Arctic shipping

Key Points:

1. Canada and the Russian Federation have requirements that regulate Arctic shipping including seasonal limitations on ship operations in Arctic sea areas under their jurisdiction, primarily based on the ice strengthening standard (ice class) assigned to the ship.
2. International Maritime Organisation (IMO) finalised mandatory standards (“Polar Code”) for Polar Shipping in 2014. The entry into force date will be 1st January 2017. The Polar Code is intended to supplement SOLAS\(^\text{113}\) and MARPOL\(^\text{114}\) and covers additional aspects of ship design and construction for international ships operating in the Polar Regions.
3. The Polar Code will require limitations to be recorded on the Polar Ship Certificate i.e. ice conditions and temperature limits of ship operations.

Background, or driver, of key points:

- The Polar Code text was finalised at MEPC67 in October 2014 (MEPC = Marine Environment Protection Committee – IMO’s committee on preventing pollution from shipping) and at MSC94 (IMO’s Maritime Safety Committee) in November 2014.
- One key outstanding issue relates to limitations: The majority of other international shipping regulations set minimum standards for international trading. However, because of the diversity of environmental conditions within the Polar areas, setting a minimum standard (of construction and environmental protection) is a challenge.
- Further work at the IMO is continuing to establish an appropriate standard/methodology for setting limitations for operating in ice through a Correspondence Group. This Correspondence Group will consider proposals submitted by IACS at MSC94 (POLARIS = Polar Operational Limit Assessment Risk Indexing System). The conclusions are to be discussed at MSC95 in June of 2015.

Contribute advice, and views, on Arctic shipping to support consideration on the “UK dimension”

Key Points:

1. There may be direct economic and/or employment benefits to the UK from:
   a. An increase in Passenger Cruise Voyages in the Arctic
   b. Imports to the UK of natural resources from the Arctic
2. UK Arctic shipping experience and knowledge will be difficult to sustain if current low volumes of Arctic shipping prevail in future. A similar situation does, however, prevail for most other countries interested in the development of Arctic shipping.
3. Any initiative, as part of a “UK dimension” of Arctic shipping, may need to consider cooperation with other countries with interests in development of Arctic.

Background, or driver, of key points:

- Based on passenger number statistics alone it could be anticipated that increased numbers of UK & Ireland citizens will be travelling to the Arctic for Passenger Cruise Voyages
- Depending upon the terms of agreements (between the cargo buyer and cargo seller) there is a possibility that UK buyers of natural resources from Arctic projects could be responsible for the provision of specialist Arctic shipping
- Other than government (British Antarctic Survey and Royal Navy Ice Patrol) Antarctic operations there are UK based staff with some Arctic shipping experience and knowledge in the marine operations and assurance staff of International Oil Companies such as, for

\(^{113}\) International Convention for the Safety of Life at Sea, 1974 as modified by the 1988 SOLAS Protocol

\(^{114}\) International Convention for the Prevention of Pollution from Ships, 1973/1978
example, Shell and BP. In addition there may possibly be some Arctic shipping experience in UK based ship owner and ship management companies. Overall though the extent of Arctic shipping experience and knowledge within the UK is difficult to assess and quantify.

8. References
2. Future Possibilities for Trans-Arctic Shipping through the Central Arctic Ocean, Niini, M., Tustin, R.D., Proceedings of ICETECH, 2010
3. Arctic Marine Shipping Assessment, Arctic Council, 2009
5. Arctic Energy Shipping Perspectives: Arctic Voyage of SCF Baltica – First Step in Regular Oil Products Trade to Asia, Sovcomflot presentation to the Arctic Passion Seminar, 2011
8. POLARIS – Proposed system for determining operation limitations in ice, MSC94/3/7, IMO, 2014
11. Fleet data and statistics are extracted from the IHS Maritime Seaweb database, www.sea-web.com

APPENDIX A: Lloyd's Register’s involvement with Arctic Shipping
Lloyd’s Register has evolved from the original classification society supporting the shipping industry to a multi-industry compliance, assurance, risk and technical consultancy services organisation. Lloyd’s Register remains a leading provider of marine classification services around the world, helping ensure that internationally recognised safety and environmental standards are maintained at every stage of a ship’s life.

Lloyd’s Register publishes and maintains rules for design, construction and survey of ships, including specific rules for ships operating in ice (ice class ships) and ships intended to operate as icebreakers.

Lloyd’s Register’s recent work on the development of ice class Rules and Regulations is significant. Having been the first class society to fully adopt the new IACS (International Association of Classification Societies) Polar Class Rules (IACS UR I), we have undertaken detailed analysis of these Rules to first validate, and then expand upon these Rules – with particular focus on their application to icebreakers intended for use in more harsh/aggressive ice conditions. We have also published the first dedicated set of Rules for Stern First Ice Class Ships (commonly known as Double Acting Ships (DAS™)). Lloyd’s Register is the current IACS (International Association of Class Societies) representative to the IMO Polar Code working group.

115 See www.iacs.org.uk
116 DAS and Double Acting Ship are Trademarks of Aker Arctic Technology Inc – the originators of the design concept for ships equipped with azimuth propulsion units and designed to operate stern first in ice
Lloyd’s Register – Written evidence (ARC0048)

Since 1977 over 1,000 ships, totalling some 11 million gross tonnes, have been built to Lloyd’s Register’s ice class notations: Our involvement includes approving the design; supervising construction and in-service survey, highlights of our experience include:

- **MV Arctic**, icebreaking bulk carrier – over 35 years of operation in the Arctic
- Icebreaker fleet built for the Canadian Beaufort oil industry exploration program in 1980s - ships that are still in operating today, mainly in other ice-covered areas
- **MT Tempera / MT Mastera**, the first and largest icebreaking double acting tankers – now with over 10 years of operational experience

Of the 127 icebreakers in the world the number that are designed and built to Lloyd’s Register class (26) is second only to Russian Register (40 icebreakers). Lloyd’s Register class icebreakers and ice-going vessels operate in all sea-ice areas: Antarctic, Baltic, Canadian Arctic, Russian Arctic, Sakhalin. Through this fleet, LR has built up a considerable breadth of knowledge regarding icebreaker design, and the through-life performance of their structures and systems.

In the last 5 years, we have been involved in a number of key Arctic Shipping Projects:

- The delivery of the latest two icebreaking supply vessels for Sakhalin Service
- The acceptance into class of the Canadian Coast Guard’s flagship icebreaker
- The approval of the design for the Canadian Coast Guard’s new icebreaker to Polar Class 2 – the highest PC class yet to be approved
- The delivery of two Double Acting Arctic Shuttle tankers for the Russian Arctic
- The approval of the first icebreaker equipped with podded propulsion forward and astern
- The approval of the first dual fuel / LNG icebreaker
- The approval of the first icebreaker / Antarctic research vessel to be built in China

**APPENDIX B: SUPPORTING INFORMATION – ARCTIC SHIPPING STATISTICS**

**B1. Transit seasons – duration and variability**

Table B1 to Table B4 indicate the regulatory seasons for Arctic Shipping along the Northern Sea Route and through the North West Passage. These are based on the interpretation of Northern Sea Route Administration and Transport Canada regulations.

The following should be noted when comparing and interpreting the tables:

- The Northern Sea Route declares Easy, Average and Hard seasons. These are based on the severity of the ice conditions at the start of the season. Canadian Arctic regulations do not differentiate and only set specific dates. However in milder seasons operators can utilise an alternative system of on-sight ice condition assessment to determine if operations are permissible.

- The Northern Sea Route regulations differentiate between independent and escorted navigation. The Canadian Arctic regulations do not, as icebreaker escort is not provided in the Canadian Arctic for commercial shipping (independent navigation is assumed).

- The North West Passage is not one passage but a number of alternative routes through the Canadian Archipelago, each route has different draft restrictions and may be open or closed depending on the movement of the Arctic pack and how the pack ice moves into the Archipelago. The easiest route has been assumed to be open for the purposes of comparison.

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117 “icebreaker” being defined as *ships with a primary function of icebreaking, and not counting cargo ships or icebreaking tugs and harbour duty vessels*. In general this equates to vessels of Polar Class PC5 or above.

118 **Canadian Arctic Ice Regime Shipping System (AIRSS)**
• Ship Category definitions follow those in the Polar Code\textsuperscript{119}
• The Northern Sea Route regulations only allow for vessels with no ice strengthening to operate independently when the water is ice free (marked with a *)

<table>
<thead>
<tr>
<th>Transit Route</th>
<th>Ship Category</th>
<th>Start</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Sea Route</td>
<td>Category C</td>
<td>Not Allowed*</td>
<td>Not Allowed*</td>
</tr>
<tr>
<td></td>
<td>(No ice class)</td>
<td>July</td>
<td>November</td>
</tr>
<tr>
<td></td>
<td>Category C</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td></td>
<td>Category B</td>
<td>Year-Round</td>
<td>Year-Round</td>
</tr>
<tr>
<td></td>
<td>Category A</td>
<td>Year-Round</td>
<td>Year-Round</td>
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</tbody>
</table>

*Table B1 Independent Operation, Mild Ice year*

<table>
<thead>
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<th>Transit Route</th>
<th>Ship Category</th>
<th>Start</th>
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</tr>
</thead>
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<td>Not Allowed*</td>
</tr>
<tr>
<td></td>
<td>(No ice class)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Category C</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td></td>
<td>Category B</td>
<td>Year-Round</td>
<td>Year-Round</td>
</tr>
<tr>
<td></td>
<td>Category A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North West Passage</td>
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<td>Not Allowed</td>
</tr>
<tr>
<td></td>
<td>(No ice class)</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Category C</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td></td>
<td>Category B</td>
<td>July</td>
<td>October</td>
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<tr>
<td></td>
<td>Category A</td>
<td>July</td>
<td>November</td>
</tr>
</tbody>
</table>

*Table B.2 Independent Operation, Average Ice year*

<table>
<thead>
<tr>
<th>Transit Route</th>
<th>Ship Category</th>
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<td>November</td>
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<tr>
<td></td>
<td>(No ice class)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Category C</td>
<td>July</td>
<td>November</td>
</tr>
<tr>
<td></td>
<td>Category B</td>
<td>Year-Round</td>
<td>Year-Round</td>
</tr>
<tr>
<td></td>
<td>Category A</td>
<td>Year-Round</td>
<td>Year-Round</td>
</tr>
</tbody>
</table>

*Table B.3 Icebreaker Supported Operation, Mild Ice year*

<table>
<thead>
<tr>
<th>Transit Route</th>
<th>Ship Category</th>
<th>Start</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Sea Route</td>
<td>Category C</td>
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<td>Not Allowed</td>
</tr>
<tr>
<td></td>
<td>(No ice class)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Category C</td>
<td>Not Allowed</td>
<td>Not Allowed</td>
</tr>
<tr>
<td></td>
<td>Category B</td>
<td>July</td>
<td>November</td>
</tr>
<tr>
<td></td>
<td>Category A</td>
<td>Year-Round</td>
<td>Year-Round</td>
</tr>
</tbody>
</table>

*Table B.4 Icebreaker Supported Operation, Average Ice year*

\textsuperscript{119} See Appendix D
In general it can be seen that the North West Passage is closed to traffic, even high ice-classed icebreakers, during the wintertime according to Canadian Regulations. The Russian Northern Sea Route does remain open for year-round shipping for high ice class (Category A ships). It is also to be noted that the Northern Sea Route only allows for independent operation of non-ice strengthened ships in ice free water: The definition of ice free water would typically mean that even during the summer months an icebreaker escort may be required.

APPENDIX C: SUPPORTING INFORMATION – ARCTIC TECHNOLOGY

C1 Detailed description of the historical development of ice-going ships

The science of optimising a hull form for ice began in the 1970s with the introduction of model scale ice basins for testing of hull forms. Prior to this, effective hull forms were derived from full scale experience. Development of new ship designs with hull forms refined in model scale enabled a significant reduction in the installed power of ice-going ships, increasing their efficiency and economy. The 1980s saw a large program of investment and development in icebreaker technology, both with respect to hull form shape and provision of auxiliary systems to aid icebreaking, primarily by reducing the friction between the ice and the ship (e.g. low friction paint, heeling tanks, air bubbler systems, water deluge systems). Figure C1 shows the performance of a number of icebreakers and icebreaking cargo ships compared. The figure uses a standard set of comparison metrics\(^\text{120}\). The y-axis is a measure of thrust per metre beam; the x-axis is the achieved ice thickness broken at a constant 2 knot speed. A number of trends are highlighted to illustrate the development of ice-going ship efficiency in recent years:

1. Green marker points: Kigoriak (1979) and Robert Lemeur (1984) have the same ice performance point; however the installed power in Lemeur is approximately 30% less. The increase in efficiency is due to optimised hull form shape and inclusion of a number of auxiliary friction-reducing measures (low friction paint, water-deluge system), all advances in technology developed in the early 1980s

2. Red Marker points: Kapitan Sorokin (1977) was a series of Arctic icebreakers, originally built with conventional “wedge” shape bows. During the 1980s the bow section of two of the class of ships were replaced, one with a unique “cutting/shearing bow\(^\text{121}\)” (New Sorokin, 1991) and one with an extreme (shallow angle) conical bow (Kapitan Nikolayev, 1990). These new bow forms were proven to increase the icebreaking efficiency by 50-65% respectively, although at a cost to their performance in open seas. The period of development between the late 1970s and the 1980s therefore saw an increase in ship icebreaking efficiency. However, primarily because of the downturn in oil price, and subsequent reduction in the economic viability of Northern oil and gas projects, investment (and engineering) associated with Arctic Technology declined. Reflecting on the progress and experimental programs in the 1980s, designers from 1990s onwards haves had a wide range of hull form solutions to select from, depending on the operational profile of the ship, principally the amount of time the ship is intended to operate in ice and the amount of time the ship is intended to operate in open water.

\(^{120}\) See An Empirical Review of the Design and Performance of icebreakers, Dick & Laframboise, SNAME, 1989

\(^{121}\) Thyssen-WaaS bow concept
C2 Development and use of azimuth thrusters for ice-going ships

The 1990s saw a new approach to addressing the challenge of icebreaking vs. open water efficiency but focused on propulsion technology rather than hull form shape. Bow propellers have been used on icebreaking ships for a number of years, prior to the 1990s the most recent adoption of bow propellers on icebreakers was the Sisu class icebreakers designed in Finland (2 propellers at the bow, 2 at the stern), the main advantage being that the water flow into the pulling propeller (at the bow) causes a pressure drop under the ice sheet ahead of the ship; which reduces buoyant up thrust on the ice sheet and promotes ice breaking by bending.\textsuperscript{122}

A development from the observed effects of bow propellers was the concept of using directional thrust to enable a more efficient process for ice channel breaking. This evolved into a project between the Finnish Maritime Administration (FMA) and Kvaerner Masa Yards (KMY) focusing on improving Baltic icebreaker capability and resulted in the first installation of an Azipod\textsuperscript{123} (Azimuthing Podded Drive), on ‘Seili’, owned by the FMA, in 1990. Figure C2 illustrates an Azimuth thruster.

\textsuperscript{122} Methods and Approaches for the Classification of ships designed for stern first operation in ice, Proceedings of Icetech 2008

\textsuperscript{123} A podded electric main motor and steering device driving a fixed pitched propeller at variable rpm. The pod can azimuth infinitely through 360 degrees by means of hydraulic motors and the system is designed to preferentially use a pulling propeller when in the normal ahead mode.”
As the azimuth thruster provides 360 directional thrust it was found that, with the unit located at the stern of the ship the ship can proceed in ice “stern first” with the stern (and the propeller) facing the oncoming ice. The beneficial effects of stern first operation from propeller and hull ice interactions are described below:

- **Ice sheet bending and breaking** - the water flow into the pulling propeller causes a pressure drop under the ice sheet ahead of the stern; which reduces buoyant up thrust on the ice sheet and promotes ice breaking by bending.

- **Flushing of ice ridges** - by azimuthing the pod adjacent to the keel of an ice ridge the variable flow of water promotes the erosion, or flushing, of the ice ridge keel.

- **Lower frictional resistance in ice** - with the propeller pulling, the water flow from the propeller washes along the length of the hull. The water flow reduces the friction between the hull and the ice by lubrication.

Ships designed for stern first operation in ice can be optimized for heavier ice conditions going astern, enabling the bow of the ship to be optimized for open water (for example using a bulbous bow) or light ice conditions. A superior open water performance may be achieved when compared with a ship with an icebreaking bow, as well as a comparable ice-going vessel designed for bow first operation in ice. The use of azimuth thrusters therefore has two principle benefits:

- Increased maneuverability in ice (the primary reason for using azimuth thrusters on icebreakers)

- The ability to optimise the ship’s hull form for open water conditions when operating ahead and ice conditions when operating stern first (the primary reason for using azimuth thrusters on Arctic cargo vessels)

Table C1 provides data extracted from Figure C1 for a number of Arctic icebreaker and cargo ship designs with similar installed engine power. The increase in efficiency in Arctic icebreakers (shaft lines) is evident and mainly due to improved hull form shape. The increase in ice performance (at the same installed power level) for Arctic cargo ships shows the improvements that can be made when using Azimuth thrusters as part of stern first operation.
Table C.1 Improvements in ice-going performance for similar powered icebreakers and Arctic cargo ships

Considering the commentary provided above it is to be noted that, as with the hull form developments in the 1980s, the successful use of Azimuth thrusters has given Arctic ship designers another option to select from when considering how to optimise the ship for its operational profile (amount of time in ice vs time in open water etc.). Successful shaft line and Azimuth thruster equipped Arctic cargo ships have been built and are in operation today. Furthermore there are two key technology challenges for the application of azimuth thrusters for large, high Arctic ships that are yet to be fully addressed:

- Power density: The amount of power (and therefore delivered thrust) from an azimuth thruster where the electric motor is located outside of the hull is currently limited
- Multi-year ice: The ice loads on the propeller and the azimuth thruster itself (which will experience ice load impact when operating ahead and stern first) are relatively untested in harsh high-Arctic conditions in strong multiyear ice.

Both issues are being addressed in an incremental, step-by-step progression, with higher powers and more harsh operating conditions planned for the near future.

APPENDIX D: ICE CLASS DESCRIPTIONS

To protect ships when navigating in ice, suitable strengthening of the ship is required. This is achieved by a special set of classification rules; the ice class rules. Ice class rules provide standards for additional strengthening of the hull structure and propulsion machinery, and often requirements for increased engine power to enable the ship to force its way through the ice.\textsuperscript{124}

Ice class rules are a strengthening standard: An additional level of strength for the hull structure and propulsion machinery is provided depending on the ice class selected. Categorisation of ice classes are normally made by assumed thickness. The assumptions regarding the ice thickness determine the loads to be applied to the structure. Currently three significant ice class rule sets are used:

- Finnish Swedish Ice Class Rules – published by the Finnish and Swedish administrations for application to ships trading in the seasonally ice covered waters of the Baltic (first-year ice): The majority of classification societies have incorporated these rules into their own standards.
- Russian Maritime Register of Shipping (RMRS) ice categories – a set of ice classes that form the basis of traffic restrictions for operation on the Northern Sea Route.
- International Association of Classification Societies (IACS) Polar Class Rules – developed over a 10 year period by collective input from a number of classification societies to

\textsuperscript{124} See Factors Influencing the Choice of an Ice Class, Design and Construction of Vessels Operating in Low Temperature Environments, RINA, 2007
form a set of standard rules for ships operating in Polar waters (presence of multi-year ice). These rules were developed to complement, and are directly referenced in, the IMO Polar Code and are now incorporated into IACS member’s rules. It is important to note that the ice class rules do not require certain ice classes for certain operational areas (with the exception of the Russian Maritime Register of Shipping, the ice categories of which are directly interrelated with Russian Northern Sea Route regulations). In addition, it has generally been the ship owner that selects what he considers a suitable ice class for his intended operations, not the classification society insisting on a specific level of strengthening (ice class is considered an optional classification notation).

The majority of the sea areas that experience ice conditions that are under the jurisdiction of national administrations do, however, have some form of shipping regulation / control system, which functions to limit the amount of high (damage) risk ships operating in ice covered areas. The main limiting criteria used by national administrations for operation is a certain ice class, dependent on the prevailing ice conditions.

Table D1 and D2, overleaf, respectively show ice classes for the IACS Polar Class Rule and Finnish Swedish Ice Class Rules and a nominal value for level ice thickness associated with each ice class.

<table>
<thead>
<tr>
<th>Polar Class Notations</th>
<th>Ice Description</th>
<th>Nominal design level ice thickness*</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC1</td>
<td>Year-round operation in all Polar Waters</td>
<td>&gt;4m</td>
</tr>
<tr>
<td>PC2</td>
<td>Year-round operation in moderate multi-year ice</td>
<td>3-4m</td>
</tr>
<tr>
<td>PC3</td>
<td>Year-round operation in second-year ice which may include old ice inclusions</td>
<td>2-3m</td>
</tr>
<tr>
<td>PC4</td>
<td>Year-round operation in thick first-year ice which may include old ice inclusions</td>
<td>1.2-2m</td>
</tr>
<tr>
<td>PC5</td>
<td>Year-round operation in medium first-year ice which may include old ice inclusions</td>
<td>0.9m-1.2m</td>
</tr>
<tr>
<td>PC6</td>
<td>Summer/autumn operation in medium first-year ice which may include old ice inclusions</td>
<td>0.7m-0.9m</td>
</tr>
<tr>
<td>PC7</td>
<td>Summer/autumn operation in thin first-year ice which may include old ice inclusions</td>
<td>0.5m-0.7m</td>
</tr>
</tbody>
</table>

Table D.1 Ice Class Notations – Polar Class

<table>
<thead>
<tr>
<th>Finnish Swedish Ice Class</th>
<th>Nominal level ice thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA Super</td>
<td>1.0</td>
</tr>
<tr>
<td>IA</td>
<td>0.8</td>
</tr>
<tr>
<td>IB</td>
<td>0.6</td>
</tr>
<tr>
<td>IC</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Table D.2 Ice Class Notations – Finnish Swedish Ice Class
Notes on table D1 and D2:

- PC6 is considered equivalent to IA Super (if engine powering requirements are met) but the equivalency is not reciprocal
- PC7 is considered equivalent to IA (if engine powering requirements are met) but the equivalency is not reciprocal
- Nominal/design level ice thickness does not set absolute limits on ice operation, but is the design value

Various other ice classes exist in addition to the above published by different classification societies. For first year ice classes (ships operating in ice that melts during the summer) there is an agreed set of equivalencies between ice classes\textsuperscript{125}. For multi-year ice classes (ships operating in ice that survives the summer and is significantly harder than first-year ice) there is no accepted equivalence.

### D2 Polar Code Categories

The current draft Polar Code divides ships operating in Polar waters into three categories. The applicability of requirements within the Polar Code is then based on the Category assigned to the ship. Polar Code ship categories are described in terms of World Meteorological definitions of ice conditions and are given in Table D3. Within the draft Polar Code the Categories are related to the IACS Polar Classes – the relevant polar classes are also presented in Table D3.

<table>
<thead>
<tr>
<th>Polar Ship Category</th>
<th>Ice Description</th>
<th>Ice Class required</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Category A</strong></td>
<td>A ship designed for operation in polar waters in at least medium first-year ice, which may include old ice inclusions</td>
<td>PC1 – PC5</td>
</tr>
<tr>
<td><strong>Category B</strong></td>
<td>A ship not included in category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions</td>
<td>PC6 – PC7</td>
</tr>
<tr>
<td><strong>Category C</strong></td>
<td>A ship designed to operate in open water or in ice conditions less severe than those included in categories A and B</td>
<td>Other ice class rules and ships notice strengthened</td>
</tr>
</tbody>
</table>

Table D.3 IMO Polar Code Ship Categories

### D3 Ship type and ice class definitions

A variety of terminology exists for use when describing ice-going ships. The following provides a brief explanation of the most common terms. These are not official definitions, but may be considered as guidance when evaluating different ship types and capabilities.

**Ice class** – any ship assigned an ice class that operates in ice.

Low ice class ships (IC to IA Super, PC6, PC7) typically operate in ice channels created by an icebreaker or are supported by icebreakers

\textsuperscript{125} See HELCOM Recommendation 25/7
High ice class ships (Polar Class ships, PC5 – PC1) typically operate independently in ice without the support of icebreakers

**Ice-strengthened** – typically used to refer to low ice class ships

**Icebreaker** – ships specifically designed to operate aggressively in ice, which may include ramming of heavy ice features and close maneuvering in ice. Icebreakers may be assigned a high ice class but typically have increased strength levels above the ice class minimum to reflect the heavy loading from aggressive operations

**Icebreaking cargo ship / Arctic cargo ship** – ships carrying cargo which typically operate independently in ice. Arctic cargo ships are typically assigned a high ice class.
APPENDIX E: Arctic Oil, Gas and Mineral Major Projects

Key: Dashed lines represent seasonal export, solid lines represent year-round export
Arctic Oil, Gas and Mineral Major Projects: Existing and Near Future

Key: Dashed lines represent seasonal export, solid lines represent year-round export, yellow markers represent near future export projects

19 January 2015
London Mining – Written evidence (ARC0046)

London Mining – Written evidence (ARC0046)

Brief outline of the efforts of London Mining to make a major contribution to the development of the Greenland economy in the form of the Isua Iron Ore Project.

Strategy

A strategy for the Arctic region is first and foremost a strategy for a development that benefits the inhabitants of the Arctic involving common interests relating to, for example, international agreements as well as regional and global issues. Such developments need to incorporate a fundamental respect for the Arctic peoples’ rights to utilise and develop their own resources as well as respect for the indigenous Arctic culture, traditions and lifestyles and the promotion of their rights.

London Mining has been working closely with the Government of Greenland to ensure the Isua Iron Ore Project is aligned with this strategy.

London Mining, through its wholly owned subsidiary London Mining Greenland, A/S, holds an exclusive exploitation licence (Licence No.2013/31) granted by the Government of Greenland for an area 150km north east of Nuuk in western Greenland. The total spend to date $72m.

Greenland

Greenland has been under home rule from Denmark since 1979. On June 21, 2009, the new constitution was introduced after the referendum for the Government of Greenland in November 2008 and country status changed to “self-rule”. Under the Government of Greenland, Greenland will become a subject under international law in matters that are within its jurisdiction. Greenland can then enter into agreements and establish bilateral and multilateral relationships with other states. Greenlanders are in possession of a Danish passport, which automatically gives them the same rights as Danish citizens and two Greenlandic-elected representatives are elected to the Danish national parliament.

Greenland has a small population of about 56,000 persons distributed in 18 towns and in about 60 settlements that stretch over approximately 2,000 km of coastline, primarily on the west coastal areas. A total of 47,091 people live in towns and 8,733 people live in settlements, (Greenland’s Statistic, 2010). Each settlement, sometimes characterized as a village, consists of a population between 1 to over 500, the majority having around 60 inhabitants. The smallest settlements are mostly sheep farmers in south Greenland, (Greenland’s Statistic, 2010).

Greenlanders have settled on the coast, in proximity to the sea. The means of transportation in Greenland is by boat, helicopter and/or airplane. There are no roads or railways connecting towns and settlements.

Since 2009, when Greenland was granted self-government, the official language of Greenland is Kalaallisut, a west Greenlandic dialect of Inuit language. However, both the
Danish and Greenlandic languages are spoken and used in the administration and Parliament. The majority of people in Greenland speak Kalaallisut. Danish is also well known and used in Greenland as a second language. It is common to be bilingual in Greenlandic and Danish, although mostly in towns. Schools and most educations in Greenland also teach in Danish. English is the first foreign language taught and scarcely spoken.

The Project

The Isua Project falls under the jurisdiction of the Greenland Bureau of Minerals and Petroleum (BMP), with a license area of 26km². The EIA and SIA were completed in 2012, followed by Public Hearings and the Exclusive Exploitation License was granted by the Greenland Government in October 2013. Key features of the project are:

- Project can produce 16.2Mwmt/a premium blast furnace pellet feed with low impurities
- Three year construction period followed by up to 15 years of operation
- 30 year exploitation licence

Application for Construction Permit has been submitted and work is in-progress to finalize approval by Greenland Government during 2014. However the project is not economic in the prevailing pricing environment for iron ore.

The project will bring major benefits to the Greenland economy with significant taxes and revenue for Greenland government, major creation of direct and indirect jobs and with major education and training opportunities for Greenlanders as well as significant local business opportunities.

The Resource

Isua iron ore deposit, initially found in 1965, is located 150km northeast of Nuuk and has been owned 100% by London Mining since 2005. Following a three year drilling campaign and based on historical data the following resources have been outlined:

- JORC classified Mineral Resource of 1107Mt with internally diluted grade of 32.6% Fe
- Additional mineralisation potential of between 950Mt and 1,500Mt including a high grade hematite target of between 150Mt and 300Mt

Brief Project Resource History

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965</td>
<td>Discovery of Isua deposit by Kryolitselskabet Oresund, Denmark.</td>
</tr>
<tr>
<td>1965</td>
<td>Isua magnetite deposit identified during aero-magnetic survey while exploring for hematite in an adjacent area.</td>
</tr>
<tr>
<td>1966</td>
<td>Isua geology mapped and hematite ore body first postulated from surface boulder train.</td>
</tr>
<tr>
<td>Year</td>
<td>Event</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
<tr>
<td>1995</td>
<td>Ownership of Isua License by Rio Tinto.</td>
</tr>
<tr>
<td>2005</td>
<td><strong>London Mining acquired Isua License.</strong></td>
</tr>
<tr>
<td>2005</td>
<td>Review of the project and preliminary mining plan for an open cut mining operation by International Mining Consultants.</td>
</tr>
<tr>
<td>2006</td>
<td>Completion of metallurgical test work program on drill core sample and bulk sample.</td>
</tr>
<tr>
<td>2007</td>
<td>Studies on the deposit including aeromagnetic, airborne radar, weather, Pipeline, Bathymetry and pelletizing studies.</td>
</tr>
<tr>
<td>2007</td>
<td>Scoping study for development of the Isua Magnetite Deposit.</td>
</tr>
<tr>
<td>2008</td>
<td>Resources drilling completed: 7 drill holes (1,154m).</td>
</tr>
<tr>
<td>2009</td>
<td>ISUA Project: Port selection and Icebergs by London Mining PLC,.</td>
</tr>
<tr>
<td>2009</td>
<td>Draft Geotechnical Site Investigations.</td>
</tr>
<tr>
<td>2009-2011</td>
<td>Resources drilling completed: 18 drill holes (3,859m). Isua Scoping Study for 5 Mtpa.</td>
</tr>
<tr>
<td>2010</td>
<td>18 diamond drill holes (3,999m in rock and 1,248m in ice)</td>
</tr>
<tr>
<td>2010</td>
<td>Prefeasibility study for 10Mtpa operation</td>
</tr>
<tr>
<td>2011</td>
<td>Scoping study completed for 15Mtpa operation</td>
</tr>
<tr>
<td>2012</td>
<td>Bankable feasibility study completed for 15Mtpa operation</td>
</tr>
<tr>
<td>2013</td>
<td>Exclusive exploitation licence awarded</td>
</tr>
</tbody>
</table>

The procedures and processes undertaken in the development of the project

**Greenland Social and Political Organisations**

The Greenlandic Parliament, Inatsisartut (legislative power and assembly), is put together by 31 members elected by Greenlandic citizens for a four-year term, which meets through sessions twice a year. A Premier is elected by Inatsisartut. The Greenlandic Cabinet is put together to form nine ministries by the elected Premier. The ministries, Naalakkersuisut, form departments, which are functioning all year round. Inatsisartut propose laws and
appropriations that Naalakkersuisut must conform to and also supervises Naalakkersuisut’s activities.

The 4 municipalities have responsibilities for culture and education; social, welfare, and health issues; economy and taxes; planning, housing and environment.

- The public sector is predominant in the Greenlandic business world compared to the semi-private and private sectors.
- Corporate-like companies (semi-private sector) are companies under the Self-Government where over 50% of the operational expense is covered by sales of products and services.
- The public companies are defined as owned by or controlled by the Self-Government. These companies are usually limited companies with the Self-Government as sole or majority shareholder.
- Greenland has a high public expenditure compared to the Gross National Product (over 70% of the GNP is for public expenditure). This is also partly due to the ownership of the large companies such as Royal Greenland A/S. The public expenditure has been increasing over the last years as the expenses regarding social services; administration and IT have increased (Greenland Statistics, Offentlige Finanser 2009, 2009).
- The national economy is very dependent on the export from the fishing industry and the Danish yearly economy transfer of DKK 3.4 billion, as shown in the figure below. There are few large local businesses, but rather many small businesses to make up the private sector, this does not induce much competition and economic stability in the country compounded with the difficult infrastructure and vast geographical distances. The tax income in Greenland is low as the income level is low for a large part of the workforce. Fishing and onshore businesses make up the largest total private income.
- Traditionally, Greenlanders are hunting people and dependent on natural resources. According to tradition the male Greenlander hunts while women gather berries, sew clothes, clean and butcher the prey. To this day these roles still exist, although not as extensively as in the past. Even though the number of subsistence hunters is decreasing, the majority of men carry a recreational hunting license and hunt and fish regularly for own consumption.

According to the Mineral Resources Act, environmental issues and other public management issues can be based exclusively on the Act.

The Act builds on previous legislation in areas relevant for this, and the provisions of the Act are aligned with the Nature Protection Act, (Greenland Parliament Act no. 29 of 18 December 2003 on Protection of Nature), and Act no. 850 of 21 December 1988 for Greenland regarding environmental matters. Furthermore, the act provides a legislative basis for Greenlandic management of obligations to international conventions.

Among the key aspects addressed by the provisions are the following:

- Planning and selection of all activities and construction in a manner to cause the
least possible pollution, disturbance or other environmental impacts.

- Use of best available techniques; including less polluting facilities, machinery, equipment, processes and technologies.
- To avoid impairment or negative impacts on the climate.
- To avoid impairment of nature and the habitats of species in designated national and international nature conservation areas and species.

According to the guidelines, the EIA procedure includes a period with ‘Environmental studies’ some years before construction starts, in order to describe baseline conditions, taking seasonal and annual variations into account. The EIA should also deal with Environmental Monitoring Programs and the need for post-closure monitoring, in order to fully cover the time span and the subject matter of potential impacts.

London Mining has conducted studies since 2007 focussed on future exploitation. The studies have included baseline studies prior to the EIA.

According to the guidelines, the key issues of the EIA are disturbances and potential pollution from the mine activities. Specific studies and assessments scoping for the EIA Isua iron ore exploitation have been developed accordingly. The EIA study has been produced in parallel with the BFS during 2011 and is published as a separate report.

**Social Impact Assessment**

The legislative provisions for Social Sustainability Assessment is presented in the Act on Mineral Resources. In November 2009, the BMP has issued ‘Guidelines for Social Impact Assessments for Mining Projects in Greenland’.

According to the Guidelines, the objectives of the SIA process are:

- To engage all relevant stakeholders in consultations and public hearings about the Project.
- To provide a detailed description and analysis of the social pre-project baseline situation as a basis for development planning, mitigation and future monitoring of the Project.
- To provide an assessment based on collected baseline data to identify both positive and negative social impacts of the Project at both the local and national level.
- To optimize positive impacts and mitigate negative impacts from the activities throughout the project lifetime.
- To develop a Benefit and Impact Plan for implementation of the Impact Benefit agreement (IBA) to be put in place for the Project.

The SIA process for the ISUA Iron Ore Mine started in October 2009 with the elaboration of a Scoping document. Scoping consultations with stakeholders in Nuuk were performed in November 2009, with a first draft of the Terms of Reference (ToR) presented to BMP in February 2010. After the ISUA Project Pre-feasibility study was issued, the ToR were updated and re-sent to BMP for comments and approval in November 2010. The details
of the field works including meetings, interviews and public consultation etc. are presented in the Social Impact Assessment (SIA) report.

London Mining submitted the SIA to the BMP in the 1st Quarter of 2012. Following review by BMP, the SIA was made final. The feedback received during the public hearing during 2012, was incorporated into the final version of SIA report.

The SIA covers the following stages in the Isua iron ore mining project:

- The construction phase;
- The operational phase;
- Closure

Public Consultations

Greenland local communities, civil organizations and governmental agencies were informed and consulted over the period from 2009 to 2011 as part of a comprehensive communication plan which involved a wide range of communications tools, formats and actions. These included:

- Field workshops with local communities
- Field workshops with civil organizations and governmental agencies;
- Public Information Meetings covered by the local media;
- Interviews with local people;
- London Mining Website dedicated to Greenland and ISUA project where technical reports are made available to public for information;
- Public Information Centre which London Mining set up in the capital city of Nuuk, where people are invited to obtain project information in Greenlandic and other languages.
- ISUA Advisory Committee which London Mining set up to gather leaders of local civil organisations such as Labour Union, Fishermen Association, Employers Association and others.

The SIA study report includes a complete description of the consultations listed above, as well as for the details about the local civil organizations, agencies and community stakeholders. The SIA study has been produced in parallel with the BFS and is published as a separate report.

For start-up, there will be in excess of 10 to 15% expatriates (which includes commissioning specialists). An operational readiness program will be implemented to ensure the operating organisation is ready to successfully manage the facility from start-up, and that the workforce is well-trained and capable.

For the first 5 years the mine and the process plant will have expatriate operators and supervisors in all positions. It is planned to progressively reduce the number of foreign operators by training and replacing the foreign workforce with local or regional personnel from Greenland and Western Countries. To achieve this, support will be sought from local
government and public employment agencies in order to identify and attract the best candidates.

The key aim is to hire as many local candidates as possible who have successfully completed a minimum educational requirement, and who have a proven ability to learn, and meet other job- specific selection criteria.

In order to progressively replace the expatriate operators, labourers and supervisors, local Greenlandic staff will be recruited thus ensuring sufficient time to achieve the training competencies required.

To realise the vision of a safe, successful iron ore project, operated by a large, competent, trained and efficient workforce, London Mining will make a significant commitment to the people for their training and professional development. Without this commitment, the vision is unlikely to be achieved.

To this end, the organisational structure of the Isua operation will include a dedicated manager responsible for the Isua training programs and training resources. The Training Manager will report to the executive HR manager. A team of training specialists, as well as training consultants, will report to the Training Manager. The Isua training team will have many tasks to accomplish, including defining the specific contents of the training programs in different languages; selecting and developing training methods, such as “on- job trainings”, apprenticeship, simulators; day-to-day scheduling and delivering of training programs in different languages; measuring performance of training; coordination of the training programs with inputs and direct involvement of different Greenlandic agencies and resources. The main agencies to be involved in the general coordination for the Isua training programs will be the Greenland Education department, BMP, Labour department and the Greenland School of Minerals and Petroleum.

The scope of the training programs will be developed according to 4 main axes:

- Health, Safety and Environment;
- Technical Training and skills development in connection with mining, ore processing and other technical sectors of the Isua operations.
- Cultural Training to help foreign workers discover the Greenlandic society and to promote cultural fit.
- Various training programs aimed at promoting and supporting the development of new local Greenlandic businesses servicing the mine operations.

Of a particular importance is the technical training of local Greenlandic personnel in various sectors of mining operations. No other large scale mining project has ever been developed and operated in Greenland, and no other large scale industrial operations exist in Greenland. On this basis, the Isua Social Impact Assessment study (SIA) has established that Greenland has a very limited reservoir of skilled personnel available for filling positions in a large scale mining operation such as Isua, and where some 700 employees are to be required for the many technical areas of the mine operations, (open pit, primary crusher,
process plant, power plants, port facilities, etc.). Under those conditions, technical training will be a key project function to achieve the objective of progressively replacing expatriate technical operators and workers by local Greenlandic personnel. In Greenland, training will thus be a key aspect of the recruitment strategy. In the area of technical training for Greenlandic personnel, a very close collaboration and working relationship will be set up with the Greenland School of Minerals and Petroleum.

In terms of technical training, an operator training program and an operator training centre will be developed in advance of commissioning the Isua Project in order to deliver the quality and quantity of employees necessary to meet London Mining’s operating objectives.

Advanced training technologies such as simulators will be used to accelerate learning and provide hands-on experience on equipment that will not be immediately available to the operators in training, (e.g. heavy haul trucks).

As Greenland does not benefit from a significant mining industry, associated mining or heavy industrial training infrastructures are absent locally. As such, the project’s training program will compensate with additional “gap” curriculum.

A general overview of the program includes three main themes: basic skills, specialized skills and HSE skills.

Basic skills training is targeted to individuals lacking the background, (either academic or experience), on an iron ore processing operation. It includes:

- Technical basics (including industrial equipment, process control, P&ID reading, etc.);
- Mining and mineral processing basics (including physics, chemistry, crushing, grinding, etc.).

Specialized skills training is targeted and customized to each job profile (for example primary crusher operator, tug operator or heavy truck maintenance technician). It includes theoretical and practical training relating to the specific tasks and responsibilities of the job and assessments which demonstrate proficiency and safety in accomplishing those tasks.

A process operator for example will receive training on the process, equipment, control and normal operation for his area of responsibility, including additional information relating to process upstream and downstream to understand their impacts.

One key feature of Isua operation during the initial years is the likely operational labour mix, (Greenlandic and foreign western countries). For this reason, instructors will be selected with language capabilities as required for the various groups. Similarly, the training material developed for the project and vendor provided training will also need to support these languages (English, Greenlandic and others).

HSE skills: In support of the strong HSE vision, culture and commitment of the project, an HSE training program will ensure that employees understand risks and hazards and how
to manage them. Each training module will include assessments which will demonstrate the related HSEC skill acquisition.

*October 2014*
London Mining plc and Anglo American – Oral evidence (QQ 203 – 213)

Transcript to be found under Anglo American
Arctic Mining in Greenland.

About the author: Hugh Mackay is an exploration geologist in the resources sector. He has a BSc in Geology from University of Edinburgh and a Sloan MSc in Management from London Business School. He is CEO of Europa Oil & Gas and Chairman of Avanna Resources. Hugh first visited Greenland as part of the 1982 Edinburgh University East Greenland Expedition. He has since made many visits to east and west Greenland as a mountaineer, skier and exploration geologist. This paper is based on these first hand experiences. He actively supports scientific research in Greenland through www.mackaygreenlandfund.com

Greenland

Greenland is 2 million km² in area, roughly the size of Western Europe and is the world’s largest island. About 80% of it is covered in permanent ice. The 20% ice free area is located on the coast and ring’s the entire coastline circumference of Greenland. The coastal area became ice free about 10,000 years ago at the end of the last ice age and at the same time as Scotland, Norway and the eastern seabords of Canada and USA became ice free. This explains some similarity in appearance between West Greenland and northwest Scotland, northern Norway.
Climate change and mining

There is an urban myth created by lazy journalists and perpetuated on the internet that suggests the coastal areas of Greenland became free of permanent ice (i.e. glaciers) very recently and that mining exploration companies have subsequently rushed in to explore on ground that has only recently become free of ice following glacial melt. The implication being that mining is a new activity for Greenland and is only possible as a consequence of climate change. This is simply wrong. The mining companies are all exploring on ground that became ice free 10,000 years ago. Furthermore mineral exploration and mining has been conducted in Greenland since the 1850’s and predates climate change. Climate change is definitely happening in Greenland and many glaciers are in retreat, I have seen this with my own eyes, however, the impact of glacial retreat on mineral exploration Greenland is zero. The area of new ground exposed by glacial melt is minimal and comprises a mix of dead ice and glacial moraine with very poor to negligible exposure of bedrock. The best place to explore is on bedrock and the best exposure of bedrock is on the ground that has been ice free for 10,000 years. Generally mineral exploration can start in late May when the temporary winter snow melts and we can see the rocks and ends in late August/early September when the first snows cover the rocks and winter starts to set in once again. This cycle is unchanged in the 32 years of my experience and miners have been exploring in this fashion in Greenland for over 100 years.

Strindbergland, East Greenland, ice free for 10,000 years

It is important to understand the difference between sea ice, the glacial ice sheet and icebergs. Whilst the impact of climate change on the glacial ice has zero impact on mining the impact of climate change on the sea ice is having an impact on access and logistics. Sea ice is frozen seawater and as the name suggests is found in the open sea where it forms vast frozen sheets that expand and contract with the seasons. Maximum sea ice cover is in March/April, minimum cover is in September. Typically sea ice is one or two years old. It is different to glacial ice which forms on land from precipitation, accumulation and compaction of snow over 1000’s of years. The glacial ice sheet is thickest in the centre of Greenland where it is 3366 m thick and at an altitude of 3275 m meaning that the bedrock it rests on is close to or below sea level. The oldest ice may be as old as 110,000 years old. The ice sheet glaciers flow slowly to the coast and marine terminating glaciers break off to form icebergs which float in the sea and should not be confused with sea ice.
As an example of the impact of climate change on sea ice: Disko Bay in West Greenland used to have sea ice for about 6 months of the year, whereas now it is sometimes ice free all year round. This potentially means year round ship access to support active mines in southwest and west Greenland, were there to be any. This is important since it means all the equipment and supplies to build and support a mine and export ore can be done all year round by sea. There is no need for the ice road truckers and access can be easier and lower cost than in remote parts of Canada. Absence of sea ice makes little or no difference to the exploration part of mining and there are currently no active mines in Greenland to take advantage of any sea ice free windows. The decline in sea ice is definitely facilitating offshore oil exploration by providing longer ice free periods and larger ice free areas in which to shoot seismic and drill. This is particularly important in East Greenland which may be geologically analogous to the Norwegian continental shelf. Norway has been extensively explored and drilled and hosts many world class oil and gas fields. There has been no drilling in East Greenland, ever. The first serious oil exploration in East Greenland is starting now with seismic acquisition, drilling is some way off due to a combination of the early stage in the process and the difficulties of drilling in a much more remote and icebound area than in West Greenland where around a dozen unsuccessful exploration wells have been drilled in the offshore.

People
The southern part of Greenland is almost as far south as Shetland with which it shares some similarity in history and geology. The current inhabitants of Greenland are a mixture of native Greenlanders and Danes. The ancestors of modern Greenlanders were the Thule culture who came over from Canada in the 10th century and worked their way down the
west coast from northwest Greenland. The older Dorset culture that were in Greenland from 400 BC ceased to exist after the Thule culture came to Greenland. The Vikings inhabited southwest Greenland and moved up the west coast from the 11th century and when a warmer climate meant this part of Greenland was amenable to cultivation of crops and keeping animals. The Viking settlement ceased in the 15th century possibly as a consequence of the little ice age and associated colder climate. It is unknown how the Thule culture and Vikings coexisted. The Danes colonized Greenland in the 18th Century. Greenland is a self-governing overseas administrative division of Denmark since 1979. Following a vote in 2008 Greenland is contemplating increased independence from Denmark.

Mining

Greenland has fantastic geology including some of the oldest rocks on earth at Isua (3.7 billion years old) and many exposures of 2 billion year old rocks that in South Africa, Canada and Australia all host world class mines. During the summer field season the rock exposure can be almost 100%, with very little cover by glacial till or vegetation. For traditional prospecting this means that in the summer you have tremendous visibility of the rocks and can get an almost 3D visualisation of the mineralisations, structures, and sequences.

Greenland has a long history of geological research both for purely scientific purposes and mineral exploration. The Danish government have funded the Greenland Geological Survey and have excellent records of expeditions and research over the last 100 years as well as collating the work of the mining companies and providing an invaluable database for new entrants to utilise and help focus their work. The Greenland government is seeking greater autonomy from Denmark including taking away the Geological Survey from its base in
Hugh Mackay – Written evidence (ARC0042)

Copenhagen. In my opinion this is a mistake. Most of the expertise resides in Copenhagen inside people’s brains and will not be relocating to Nuuk. Greenland has a population of 55,000. With these demographics I feel that the support of Denmark on technical, commercial, legal and other professional issues is very helpful for a very small country. For example: negotiating with ExxonMobil (population >400,000 and probably the smartest guys in the room). The same arguments can be applied to defence, diplomacy, healthcare and education.

British geologists have been very active in Greenland since the 1930’s beginning with the expeditions of Lawrence Wager to East Greenland and continuing to the present day.

Despite the fantastic geological ingredients there have only been two proper profitable mines in Greenland: the Ivigtut cryolite mine at in southwest Greenland and the Black Angel lead zinc mine in West Greenland. Both are now closed, in 1958 and 1996 respectively, and there are no other active mines of any significance in production. The Nalunaq gold mine in southern Greenland was never profitable and shut in 2008. There is one iron ore project operated by London Mining (UK) at Isua in West Greenland that has an exploitation permit but a startup decision has not been made yet. There is a mixed uranium and rare earth project in southwest Greenland operated by an Australian company called Greenland Minerals and Energy that has not been granted an exploitation permit yet but has attracted significant interest amongst the Greenlandic population due to the contentious nature of developing uranium. In 2013 the newly elected Siumut party repealed a decades long ban on exploring for uranium, perhaps seduced by the prospect of defying Denmark and political lobbying by the Australians. There is a small ruby development at Fiskenaesset in West Greenland by True North Gems a Canadian company. They have an exploitation permit but have yet to raise capital to build the mine.

Ivigtut Cryolite mine, West Greenland                      Black Angel Pb-Zn mine, West Greenland

Our experience at Avannaa has led us to believe that nothing short of a world-class giant deposit will support a commercially feasible mine development. Greenland is remote and lacks mining infrastructure. Whilst logistics can be comparatively simple they are expensive.

There is a significant amount of mineral exploration going on with a hardcore of about half a dozen companies (including my own company Avannaa Resources) actively exploring. Exploration burns money, it does not make money and most exploration fails. Production makes money and delivers long term employment and tax revenues to the host government.
There is no production in Greenland only exploration. Unfortunately the exploration companies have not explained this very well, not only in Greenland but also in most of the rest of the world. Many Greenlanders are mistaking exploration activity for production and in some cases the politicians are already making plans based on notional tax revenues from discoveries that either haven’t been made yet or are nowhere near production. This is in turn is driving a desire for greater independence from Denmark funded by non-existent revenues from non-existent mines. For example in 2008-2010 Cairn Energy spent $1.6 billion drilling 6 wells offshore west Greenland, a huge investment anywhere in the world. Salary tax alone for the offshore workers generated an additional tax revenue of $15 million, a not insignificant number compared to the ~$600 million Danish subsidy that runs Greenland. Unfortunately all the wells were dry and exploration stopped. The golden goose has not started laying eggs, this does not seem to stop politicians imagining and spending the non-existent revenues.

No one likes living on handouts and it is understandable that the Greenlanders are very interested in the financial benefits of mining development. They are a practical people and very definitely do not want to be kept as a giant nature park for the benefit of middle-class do-gooders who don’t have to live there and never visit. Of all the countries where Greenpeace operate Greenland is the one where they are resented the most. The main sources of revenue are fishing and tourism. In the past the Ivigtut cryolite and Black Angel lead-zinc mines were important for the economy and as sources of employment. These mines are long gone. Greenland looks to Denmark for guidance on health, safety and environmental matters. None of the Scandinavian countries are pushovers on HSE and as a consequence Greenland is properly regulated and mining and oil explorers have to obey these rules. Any suggestion that mineral exploration in Greenland is not currently regulated to the highest international standards is simply not true. There is a fear that should Greenland eliminate Denmark from any say in Greenlandic matters that these rules may change and lower standards may be creep in.

Greenland and Denmark have cut a deal whereby any revenues from mining or oil production will be shared until the Danish subsidy to Greenland of $650 million per annum is exceeded; at which point they will renegotiate the deal. It will be many years before any revenues at all are generated let alone exceeding the subsidy. Should there be any revenue from mining production I have concerns about which end-member the country ends up as:

- West Africa where an elite steals the money through rampant corruption
- Nauru where the small island population became very unhealthy by eating the revenue and the government lost the rest due to failed investments
- UAE where guest workers do most of the work and dominate the working population
- Norway where the revenues are managed for the long term with an oil/minerals fund and strong participation of the population in the economy

Greenlandic governments have suffered in the past from low-level corruption and nepotism. Previously the stakes have been low. Revenues from mining would significantly increase the prize for corruption and greater/total independence from Denmark would remove oversight.
With such a small and fragmented population it would be possible for elite to steal significant sums.

Were the first active mine of the new era to be located in West Greenland then this is close to population centres and every Greenlander who wants a job will probably get one. Most of the senior positions are likely to be occupied by expatriates since the number of qualified Greenlanders is very small and the competition for these employees is very high. To my knowledge there is one active Greenlandic geologist under the age of 30 and about four over that age. If there were to be a second mine on the west coast then the Greenlandic content of the work force may be much less since everyone who wants a job probably has one already at the first mine. Were mines to be developed in remote parts of East and north Greenland then the Greenlandic content may be much lower. The east coast has about 3000 people in total and the cultural and social preferences of the West Greenlanders may mean that future mines have to rely on foreign workers flown in to work. London Mining are suggesting that they may use Chinese workers at the Isua mine in west Greenland on the grounds that Greenlandic labour is the same price as Danish labour (i.e. expensive) and that Chinese workers will be lower cost. This argument is not going down well with the Greenland labour unions.

Greenland is the wild frontier of Europe. You can buy a rifle and ammunition in the supermarket. Greenlanders wrestle with the same issues we do. They love their children and want them to have good access to education and opportunity. They want to embrace the modern world without losing sight of their heritage and values. They have problems with unemployment, alcohol, drugs, corruption, child abuse - same as everywhere else. They are a very large country, with a very small population and a wild polar environment. The Greenlanders are survivors and will adapt to climate change better than most societies. Finding the right development appropriate to their needs is a delicate and difficult matter. Previously the government of Greenland and Denmark successfully managed mining production revenues from the Ivigtut cryolite and Black Angel lead zinc mine without creating a “resource curse”. The challenge for Greenland, should there be commercial production, is to manage the opportunity and revenue to enhance the lives of all the people and create a long term benefit. They are a small population and the margin for error is small.
Illulisat, West Greenland, Greenland’s second largest town

October 2014
Transcript to be found under Clarksons Research Services
My Lord Chairman

1. Yesterday’s session (29th July 2014) covered a great many areas, some in quite some depth, however there was not enough time to cover all the aspects outlined in the questions identified in advance. I would like to take this opportunity to provide additional information for your consideration; I would also like to clarify a point made yesterday about the process for the introduction of the Polar Code.

Question 3 – Critical Infrastructure

2. There are a number of critical infrastructure elements that need to be in place to support the development of the Northern Sea Route (NSR); many of which were discussed in some depth yesterday. However, time pressures prevented the discussion from addressing the following additional issues:

   a. Shore facilities for off-loading oil or oily waste. The Polar Code will introduce a total ban on the discharge of oil or oily waste even though it may be permissible within the International Convention for the Prevention of Pollution from Ships (MARPOL) regulations. This will be the case for all vessels to which MARPOL applies, affecting both those that transit the region and those that operate solely within it. Thus the ports to which the vessels travel will have to ensure that there is a significant uplift of the facilities required to process such waste once the vessel docks. A corollary to this aspect is the increased likelihood of such discharges being delayed by those vessels expecting to exit the region until they do reach an area where they are permitted. This may lead to an increase in pollution levels at the boundaries of the arctic region.

   b. Hydrographic Charts. There is a dire shortage of up-to-date, accurate charts for the arctic region and the gathering of such information will be costly and time-consuming. There are a number of reasons why the UK should support this data-gathering exercise, not least of which is the need to retain the UK Hydrographic Office’s (UKHO) prime position in the world. This doesn’t mean that the UK should directly support hydrographic surveys throughout the region but there are a number of reasons for taking direct action:

      i. Commercial Data. Admiralty Charts are acknowledged as the ‘gold standard’ throughout the maritime domain, with many countries’ military assets using them for general navigation. Whilst the UKHO has a number of bi-lateral and multi-lateral data exchange agreements already in place if there is no data to be exchanged then they remain largely irrelevant. Keeping the UKHO at the top of the table may require additional data gathering effort otherwise commercial vessels will look to other sources of hydrographic charts for the NSR and hence may also stay with those sources outside the polar regions.

      ii. Military Data. Hydrographic data gathered from within a coastal nation’s EEZ can only take place with that nation’s agreement and must be shared with the nation
involved. There may be data which is required by the UK military to support FCO, MoD and Coastguard requirements and which the UK may not wish to share with a coastal nation. Military Data Gathering (MDG) is recognised across the world as a means by which militarily significant data can be gathered without the permission from or sharing with the relevant coastal nation – provided it does not then become commercially available. In order to support this, the Royal Navy’s Hydrographic Survey Vessels could be used to gather this chart data; this would have the benefit of gaining the data but would also exercise the UK’s rights to operate within a contested area, supporting a number of domestic and international efforts. By way of example, it would also put pressure on Russia at a sensitive time should an RN vessel be deployed into the Barents Sea or even the Kara Sea.

c. Disaster Relief. Each coastal nation has a responsibility to provide search and rescue capabilities covering zones that are agreed through the IMO. However, it may be the case that to support an incident, the coastal nations’ assets may be fully committed and in such an event it would be for adjoining nations to help ‘close the gap’ in the coverage. For this to be viable international agreements need to be in place to enable each nation to move into adjoining areas or zones – and that requires assets which are capable of being deployed for longer periods than might otherwise be the case.

d. Policing. As was identified during the discussion yesterday, enforcement of the regulations will be a significant requirement. Ports of departure or destination will need to develop inspection regimes for those vessels whose transit will take them through the arctic region. However, policing of the area will also need to be achieved and whilst it is incumbent on those coastal nations to police their own territorial seas and EEZs, there is a general requirement for policing the High Seas. Again, the various coastal nations must have assets in place to cover the world’s oceans but it may be prudent to consider developing a UK based capability to support such policing. In a similar way to MDG, the ability to deploy a UK military asset into the region would influence coastal nation’s claims to additional territory within the Arctic Ocean.

Question 4 – Environmental Factors

3. A number of environmental factors were discussed during the session yesterday but there are a number of aspects that were not addressed due to the pressures of time. One of the main element was that of the physical environment:

   a. Sea Bed Information. Whilst there is a need for hydrographic surveys to identify the safe routes through which vessels may transit, there is also a need to survey the whole of the basin to ensure an accurate picture of the sea bed to be developed. This will support national claims and will identify where, by extension, the high seas limits are defined. There is simply a significant lack of information about the shape and extent of the continental shelves, the abyssal plains and the areas of land which do dry out and which may therefore extend national coastlines and territorial claims.

   b. Physical Oceanography. Climate models have consistently failed to provide accurate forecasts of the way in which the ice melts and reforms outside the local effects of the
weather. This has led in the past to a lack of faith in the models that has a detrimental effect on the commercial risk assessments for the region and therefore lost opportunities. In part this is due to a limited understanding of the physical processes by which energy is transferred from the atmosphere to/from the ice and between the ice and the ocean itself. However, there is also a significant shortfall in the measured data sets that underpin the models and significant investment needs to be made in gathering the physical oceanographic data both in the short and medium terms. The UK’s current investment in persistent ocean data gathering platforms through the Technology Strategy Board (and the MoD equivalent, the Centre of Design Excellence (CDE)) should be accelerated in order to take advantage of this developing opportunity.

c. Meteorology. Again, climate models have consistently underplayed the observed changes within the arctic region. Partly this is down to a need to understand the physics in this complex area and in particular the way in which the rotational forces decrease in importance around the pole itself. However, there is also a severe shortage of observations which can be used to initialise and test the model outputs. Whilst satellite observations can provide wide area coverage, there is also a requirement for ‘ground-truthing’ the satellite data. This is currently being undertaken by multi-national teams but only in a few, widely scattered points and they must be increased in density in order to support the data gathering effort.

d. Weather and Ice Forecasting. Weather and ice forecasting capabilities are a critical element in ship routeing and whilst there are a number of centres providing these services their quality and robustness is a direct function of the actual weather information gathered across the region.

4. Data gathering points on land, sea and ice are few and far between and more effort needs to be put in to increasing these observations – and getting the data out to the WMO network in a timely fashion for ingestion into the various regional and global models. The UK Met Office (UKMO) is recognised as a world leader for global and North Atlantic forecasting but should be supported in developing an arctic weather and ice forecasting service. There are regional forecasting centres (Moscow is a significant supplier) and they should either be invested in (bi-lateral agreements?) or, preferably, overtaken by the UKMO as the preferred source.

5. Ice information and forecasts are critical for ships which may want to transit outside of territorial waters – especially for those with no ice strengthening who also want to avoid the significant charges local ice-breaker escorts bring.

**Question 6 – The Polar Code**

6. I stated yesterday that the Polar Code would need to go through a ratification process after its coming into force next year. I was, however, somewhat misleading as that would be true only for new instruments introduced through the IMO. The Polar Code, however, is an adjunct to existing instruments and as such requires agreement in the working group followed by the various sub-committees and overarching committees before approval in a plenary session of the main IMO body. Once that has been achieved, the
adjuncts will come into force after a short period by tacit agreement. No ratification of the Code is required, as the instruments themselves have already been ratified.

7. There are a number of provisions within the Code that will have an immediate impact on vessels using or intending to use the arctic:

a. Lifeboats. At present, SOLAS requirements enable the use of open lifeboats and there are a significant number of vessels that rely on them to retain certification. However, when the Polar Code comes into effect, these types of lifeboats will be prohibited. Normally, amendments provide a period of grace whereby existing vessels that fail the new regulations are allowed to continue operations for a defined length of time. However, there will be immediate ban on those vessels with open lifeboats and although there are very few currently operating in the arctic some vessels (especially tourist or cruise ships) may fall within this category.

b. Discharges. As mentioned earlier, there will be a number of additional restrictions on the discharge of waste products above and beyond those permitted under current MARPOL regulations. At present, it is the distance from land that is the defining element in determining whether or not discharges may be allowed. However, proximity to ice either as an ice shelf, an iceberg or loose ice above 1/10 will also be an element in the decision making process and the policing of this aspect will require wide area search capabilities; these in turn may require multi-national collaboration to fund, design and deploy.

Recommendations for the UK

8. At the close of the session, you offered a chance to make recommendations for the UK to take advantage of the opportunities that the opening of the arctic may bring. Once again, time pressures restricted the chance to respond in full but I offer my opinions below.

a. EU Point of Entry. During the session I suggested that the UK develop the port and transport infrastructure to provide an attractive point of entry into the EU rather than let other ports (e.g. Rotterdam) take advantage of such traffic. I proposed that a port in the northeast of England be developed and that Hull would be, perhaps, a suitable location. However, Hull was only an off-the-cuff suggestion and I would suggest that Newcastle might make a more logical place to make such an investment.

i. **Recommendation**: Conduct a study to identify the opportunities, costs and benefits developing such an EU point of entry within the northeast of England (or southeast of Scotland) and which, if any, existing ports would create the greatest benefit for the UK.

b. Data Gathering Systems. There is a significant need for high quality observed hydrographic, oceanographic and meteorological data and for such data to be process for climate and weather forecasting models. The UKHO and UKMO are ideally placed to take advantage of such data to provide world class forecasting and charting services that would also provide significant income streams for the UK.
i. **Recommendation**: Encourage the development of data gathering systems capable of persistent autonomous observing by enhancing the TSB supported research streams.

ii. **Recommendation**: Support the UKMO in developing short and medium term forecasting services for weather and ice products across the region.

iii. **Recommendation**: Work with the MoD and UKHO to gather hydrographic data across the region both commercially in conjunction with the relevant coastal states and using MDG assets for militarily and policing services.

c. **Maritime Services.** London has been central to the provision of maritime service (insurance, brokerage, financing etc.) for many years but has recently been sliding down the international table, losing out to other, more attractive centres (such as Singapore).

i. **Recommendation**: Work with the financial services authorities and multinational companies or organisations to provide a more attractive environment that will encourage the maritime service industry to stay or return to the UK.

C R Manson  
Director  
Manson Oceanographic Consultancy  

*30th July 2014*
Professor Maurice Mendelson QC, Professor Robin Churchill and Professor Philip Steinberg – Oral evidence (QQ 50 – 62)

Transcript to be found under Professor Robin Churchill
This note is submitted by way of background to, and elaboration of, oral testimony given by the author to the Committee on 22 July 2014 on particular issues.

1. How, generally, do the provisions of the Law of the Sea Convention 1982 (‘LOSC’) apply to a body of water such as the Arctic Ocean? What rights do states have in the various different areas of the ocean, such as territorial seas, the contiguous zone and the exclusive economic zone?

With limited exceptions, the whole of the general international law of the sea applies to the Arctic. This is a very large subject, and I will simply summarise the most pertinent aspects.

The LOSC has been ratified by most states, including all the riparians of the Arctic except the USA. States not bound by the Convention are in certain cases bound by the relevant Geneva Conventions of 1958 on the law of the sea, but otherwise by customary international law. Customary international law is the law that emerges through the constant and uniform practice of states: much of it pre-dates the 1958 and 1982 Conventions and is reflected in them; but some customary law has evolved during the 20th century, due in part to the length of process of negotiating the LOSC. The USA accepts that most of the provisions of the Convention reflect existing international law.

The two main pillars of the law of the sea are first, flag state jurisdiction; and secondly, what I have called zonal jurisdiction. All states have jurisdiction over ships and aircraft registered in their territory (‘flag state’ jurisdiction), wherever they are. Secondly, coastal states have jurisdiction in various zones off their shores. If you take an island like Great Britain, very roughly you can think of a series of concentric circles around its coast, where the intensity of jurisdiction gets weaker the further out you get - a bit like a magnetic field - until you get to the high seas, which are beyond the limits of national jurisdiction. This zonal jurisdiction is particularly important in Arctic waters, because it covers almost all of them, at least so far as the seabed is concerned.

Before I elaborate on the different zones, I should briefly mention the important topic of baselines.

Baselines are the lines from which jurisdictional zones are measured – mostly seaward, but any waters landward of the baselines are ‘internal waters’ and subject to the full sovereignty of the coastal state.

The normal baseline is the low-water line along the coast; but the Convention allows artificial, straight baselines to be drawn in a variety of circumstances. Amongst the most important, in the present context, are straight baselines across bays, on the seaward low-
water lines of fringing islands; and where the coast is deeply indented. All of these features
are present in abundance in the Arctic, which means that a substantial amount of salt water
is in fact claimed as internal waters. The main significance of this is that, unlike the
territorial sea, there is no right of innocent passage of ships through internal waters. It is
noteworthy that Canada has declared large parts of the North-West Passage between the
Atlantic and the Pacific to be Canadian internal waters, giving rise to protest from others
who wish to preserve freedom of navigation.

The first zone seaward of the baseline is the **territorial sea (waters)**, which may extend for
up to 12 nautical miles (‘nm’). The coastal state has full sovereignty over it, save that there
is a right of innocent passage through it for ships (though not, without consent, aircraft).
The basic concept of innocent passage is simple enough: the passage should not threaten
the peace, good order or security of the coastal state. But in fact may controversies and
complications have been encrusted on it. For instance, it has been controversial whether
warships, as opposed to merchant ships, enjoyed a right of innocent passage. And the
obligation of submarines, when engaged in passage, to surface and show their flag posed a
threat to the most effective part of the deterrent on which the nuclear ‘balance of terror’
depended: the ability of nuclear-armed submarines to roam the seas undetected.

Hence, in return for making concessions on e.g. the permissible breadth of the territorial
sea, the major naval powers procured a virtually unrestricted right of ‘strait’s passage’
through, under and over straits (and archipelagic waters). This applies to all kinds of vessels,
and aircraft.

- **Beyond the territorial sea, for up to 24 nm from the baseline, is the contiguous zone (if
  claimed).** This is a protective zone to enable coastal states to enforce their customs,
fiscal, sanitary (i.e. health) and immigration laws. So far as I am aware, it is not of
particular interest in the Arctic, so I shall not elaborate here.

The next zone, extending up to 200 nm from the baseline, is the **exclusive economic zone
(‘EEZ’)**. The regime here is not one of full sovereignty, but a *sui generis* bundle of rights.
These include ‘sovereign rights’ over the resources of the seabed and subsoil – which,
however, are subsumed under the regime of the continental shelf (which I deal with
below) – and over artificial islands and devices for producing energy from wind and
waves etc.; limited rights over marine scientific research; even more limited rights over
pollution; and complex regime of exclusive or semi-exclusive rights over fishing, with
special arrangements carved out for certain special species, such as highly migratory
ones and anadromous species such as salmon. A propos, a supplementary Agreement on
Straddling Stocks was concluded in 1995, to deal mainly with the regulation of fishing of
stocks which straddle both EEZs and the high seas. There are currently 81 parties
(including the EU)– non- parties include not only most of non- parties to the LOSC, but
some others, notably China.

So far as concerns navigation in the EEZ, the position is broadly similar to that pertaining in
the high seas – freedom for all ships of all states.

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126 The policy of ‘mutually assured destruction’.
The regime of the *continental shelf* gives coastal states ‘sovereign rights’ for the purpose of exploring, exploiting, conserving and managing the resources (living and mineral) of the seabed and subsoil, but not the superjacent waters or airspace. It started off as rights over the natural prolongation under the sea of the land mass – part of the geological continental margin, comprising continental crust as opposed to the basalt of the deep sea-bed. If a state did not have a natural prolongation, it did not have continental shelf rights.

But all of this changed under the LOSC – partly because of the influence of the emerging concept of the EEZ. Now, provided that there are no opposite or adjacent states in the way, all coastal states are entitled to a ‘deemed’ continental shelf, whether or not there is a natural prolongation. They are entitled to up to 200 nm from the baseline automatically, irrespective of geology; beyond that they have seabed rights only if, as a matter of fact, they have a continental margin which is more extensive. Because there is not usually an abrupt change between the continental margin and the deep sea bed (which is beyond the limits of national jurisdiction), but rather a transitional zone called the ‘continental rise’, whose sedimentary layers get thinning and thinner the further one travels seaward, the LOSC provides alternative scientific criteria (at the coastal state’s option) for determining where the continental shelf ends and the DSB begins. It means that some states can and do have continental shelves of up to 350 nm from the baseline, and in some cases even beyond (100 nm from the 2500 metre isobath): Articles 76(2)-(10).

Because the science here is difficult and can be contentious, the LOSC established the Commission on the Limits of the Continental Shelf: ‘CLCS’. The function of this body, which comprises exclusively scientists, is to decide on the validity of claims to the outer continental shelf beyond 200 nm. Once the Commission has approved a state’s claim, the limit is definitive in the sense that it cannot be challenged by other states or organisations. This is different from the determination of the continental shelf boundary between opposite or adjacent states, which I shall deal with shortly. It should be noted that the CLCS processes claims very slowly, and there is a large backlog. In 2011, the Commission estimated that the most recent submissions on its docket could not be reviewed before 2032; since then, some 17 additional submissions have been made, including from Canada and Denmark in respect of the Arctic. Russia has also had to resubmit its claim. The USA has no standing to submit its claims to the CLCS, since it is not a party to the LOSC.

Generally speaking, *islands* are entitled to all of the zones of jurisdiction described so far. However, according to Art. 121 of the LOSC, ‘rocks’ are not entitled to an EEZ or continental shelf unless they are ‘capable of sustaining human habitation or an economic life of their own’. This could be significant in the Arctic; but there is no definition of ‘rocks’ or the other criteria I have quoted, which could become controversial.

The primary method for *delimitation between states which are opposite or adjacent in relation to the same jurisdicational zone* (territorial sea, EEZ or continental shelf) is agreement. And quite a substantial number of maritime boundaries of one or more of these zones have been agreed between states, following negotiations – sometimes very protracted. If states cannot agree (and there many such cases, including several in the Arctic), they need – if the dispute is not to fester – to submit their claims to adjudication or...
arbitration. The problem is that the criteria laid down by the LOSC are rather vague.\textsuperscript{127} Nevertheless, tribunals have been able to establish boundaries, and precedents have emerged which—while by no means binding—offer some guidance. It is worth noting that the main body deciding such issues so far has been the International Court of Justice (the ‘World Court’ at The Hague), followed by ad hoc arbitral tribunals. The Law of the Sea Tribunal in Hamburg is an option which has so far only been used for delimitation on only one occasion.

There is a potentially complex interaction between the determination of the outer limits of the continental shelf by the CLCS, on the one hand and, on the other hand delimitation between opposite or adjacent states who have overlapping claims to the continental shelf beyond 200 nm. There is a risk of an ‘After you, Alfonse’ impasse whereby the CLCS is unable to decide the outer limits of areas in dispute unless the parties agree; but there are dicta from the International Court of Justice to the effect that it cannot delimit overlapping claims to the seabed beyond the 200 nm limit where this might prejudice the decision of the Commission.

The regime of the high seas beyond the limits of the various zones of coastal state jurisdiction is one that I have briefly anticipated. For the most part this is a common zone where all vessels of all states are free to navigate, fish and so on, subject to respect for the rights of others. However, states can by agreement derogate from this, and have done so in a number of respects. These include the adoption of regulations (mainly under the auspices of the International Maritime Organization) for the safety of life at sea, the regulation of pollution, safe ship construction, etc. There are also a number of (mostly unconnected) fishery conventions, dealing with fishing for certain species or in certain areas, or both.

For the sake of completeness, I should mention the area of sea-bed and subsoil beyond the limits of national jurisdiction—the ‘deep sea-bed’ or ‘Area’, according to the LOSC. Its resources are supposed to be the ‘common heritage of mankind’ and immune from unilateral appropriation or exploitation. Accordingly, Part XI of the LOSC established a complex structure, including an International Seabed Authority which was supposed to licence exploitation and also to engage in a certain amount of exploitation on its own account, the proceeds to go to developing countries. However, this system proved to be unacceptable to some—notably the USA—and because the LOSC was supposed to be a package-deal, whose provisions could not be cherry-picked by states, in 1994 a compromise was adopted which was supposed to ease the way for the USA and some other hold-outs (including the UK) to ratify the Convention. This was the euphemistically named ‘Agreement on the Implementation of Part XI of the LOSC’, which is really an agreement to weaken those provisions considerably. As we shall see, as it happens even this has not so far enabled to the USA to ratify the Convention. The Agreement has 145 parties to date. Apart from the practical difficulties, the Part XI regime is of limited interest in the present context, because all but a small part of the Arctic seabed is claimed or potentially claimable by the riparian states.

\textsuperscript{127} For delimitation of the territorial sea, equidistance is the preferred method, save where historic title or special circumstances require a different method; for delimitation of the continental shelf and EEZ, the Convention simply prescribes delimitation ‘on the basis of international law’.
Part XII of the LOSC deals with the protection of the maritime environment. It does so in considerable detail; but nevertheless is simply provides a framework which other treaties elaborate on, on a global, regional or subregional basis. Very broadly speaking, the LOSC puts the primary responsibility for protection of the maritime environment on flag states, whose role is to make and enforce regulations for vessels flying their flag; But port states are also given functions in relation to the detection of breaches, and costal states have limited jurisdiction. Put very simply, the latter have a quite substantial jurisdiction to promulgate and enforce their own environmental protection regulations in the territorial sea; but the further out from this zone the pollution takes place, the weaker the coastal state’s rights.

Special mention should be made here of Article 234 of the LOSC, which deals with ice-covered areas in the EEZ. Because such areas are particularly susceptible to environmental damage, and because they present exceptional hazards to navigation that could result in such pollution, here coastal states have exceptional rights to prescribe and enforce regulations for prevention, reduction and control—greater than they normally have in the EEZ. However, these regulations have to be enacted and applied on a non-discriminatory basis and they must have due regard to, inter alia, navigation. This is a very contentious subject in the Arctic; Canadian legislation being the most conspicuous and controversial case so far.

Third-party settlement of disputes depends on consent; and traditionally this has been a sensitive subject for states. However, the LOSC has made substantial advances in this respect. There is a complicated system for compulsory adjudication or arbitration: put simply, states party to the Convention have to choose from a menu of possible tribunals, including the ICJ, the Law of the Sea Tribunal and arbitral tribunals. Where contending parties choices match, the dispute goes before that tribunal; where there is a mis-match, the result is compulsory arbitration. However, some types of dispute are not subject to this system, but are still subject to compulsory conciliation—a process, somewhat akin to mediation in English family law, where the third party’s decision is not necessarily based on what the law provides, and is not binding. A notable example in the present context is Art. 298(1)(a), which allows states to exclude delimitation disputes from compulsory arbitration or adjudication, at least initially.128

My fellow-witness, Professor Churchill, will deal with this topic in more detail.

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2. What is the effect of the United States failing to ratify UNCLOS? What does the US gain (and lose) from this? What is the impact for governance in the Arctic?

128 If the parties do not accept the report of the conciliation commission and do not negotiate an alternative solution, they are then obliged to accept compulsory and binding adjudication or arbitration, as above.
President Ronald Reagan’s ‘Statement on United States Oceans Policy, March 10, 1983’ made clear the main US misgiving:

I announced that the United States will not sign the United Nations Law of the Sea Convention that was opened for signature on December 10. We have taken this step because several major problems in the Convention’s deep seabed mining provisions are contrary to the interests and principles of industrialized nations and would not help attain the aspirations of developing countries.

Since then, and particularly after the watering-down of the deep-seabed provisions of Part XI of the LOSC by means of the 1994 Agreement to which I have already alluded, the attitude of the Administration has gradually come round in favour of ratification of the LOSC.

As former Secretaries Henry Kissinger, George Schultz, James Baker III, Colin Powell, and Condolezza Rice pointed out in a recent op-ed entitled ‘Time to Join the Law of the Sea Treaty’, ‘Flaws in the treaty regarding deep-seabed mining, which prevented President Ronald Reagan from supporting it, were fixed in 1994.’

Presidents Bill Clinton and George W. Bush have supported ratification, as do Presidents George H.W. Bush and Barack Obama.

As noted above, the USA now considers UNCLOS as reflective of customary international law. This is clear from a statement by General Counsel (the chief legal officer) of the National Oceanic and Atmospheric Administration of the U.S. Department of Commerce, who under President Barack Obama has stated that: ‘Although not yet a party to the treaty, the U.S. nevertheless observes the [LOSC] as reflective of customary international law and practice.’

One main argument against ratification by the USA has been that subjecting the USA to international laws would diminish US sovereignty on the high seas. This argument is not always well informed, as the following example bears out. Mark Helmke, a spokesman for Senator Dick Lugar (Republican, Indiana), a key supporter of US ratification of the LOSC, observed: ‘It’s a classic case where a well-organized minority can stop something that is supported by the broad majority.’ Apparently, Lugar’s office was besieged with phone calls from constituents who sincerely worried ‘that the law of the sea meant the UN could take over every single fishing pond in the state’.

Another argument sometimes made in the USA is that, given that the USA already recognises that UNCLOS is reflective of customary international law, there is little to be gained by ratifying it.

Kissinger and his co-authors, however, made the following two points about the effect of non-ratification by the USA, as seen from a US perspective:

129 Available at: www.gc.noaa.gov/gcil_los.html
The U.S. currently has no input into international deliberations over rights to the Arctic, where rich energy and mineral resources are found more than 200 nautical miles from any country’s shoreline. Russia has placed its flag on the North Pole’s ocean floor. This is a largely symbolic act, but the part of the Arctic Ocean claimed by Russia could hold oil and gas deposits equal to about 20% of the world’s current oil and gas reserves.

As a non-party to the treaty, the U.S. has limited options for disputing such claims and is stymied from taking full advantage of resources that could be under U.S. jurisdiction. Lack of participation in the convention also jeopardizes economic opportunities associated with commercial deep-sea mining operations in international waters beyond exclusive economic zones—opportunities now pursued by Canadian, Australian and German firms.

As the Arctic continues to open up as its ice cover declines, other Arctic countries, such as Russia and Canada, continue to submit claims to the CLCS in order to acquire sovereign rights over valuable energy and minerals resources. While the USA continues to map its extended continental shelf in the Arctic, it cannot make internationally recognized sovereign claims to energy and other natural resources it discovers until it ratifies the treaty – and it cannot challenge claims made by Russia or other Arctic countries that conflict with its own scientific assessments. Admiral Robert J Papp of the US Coast Guard has observed that, ‘with accession to the Law of the Sea Convention, the United States has the potential to exercise additional sovereign rights over resources on an extended outer continental shelf, which might reach as far as 600 nautical miles into the Arctic from the Alaskan coast.’

In addition, China, a party to the LOSC, rejects US interpretations of the treaty’s freedom of navigation provisions, and continues to assert what the US regards as excessive claims to control over large swathes of the South China Sea. As President Obama recently stated: ‘We can’t try to resolve problems in the South China Sea when we have refused to make sure that the Law of the Sea Convention is ratified by our United States Senate, despite the fact that our top military leaders say the treaty advances our national security’. 130

Nevertheless, the US Administration often finds that foreign policy initiatives that it considers desirable get held up by Congressional opposition or inertia, and one cannot predict with any confidence that the LOSC will be ratified by the US any time soon.

*September 2013*

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Transcript to be found under Christian Le Mièrè
As part of the DECC/Defra funded Met Office Hadley Centre Climate Programme, the Met Office conducts research on the Arctic region, both in terms of monitoring long-term changes and on improving weather and climate predictions through improved understanding and modelling of Arctic processes. Reducing uncertainty in model projections of Arctic sea ice to inform policy decisions requires a combination of increased and better observations and an increased ability to better represent Arctic processes in climate models.

In response to the Committee’s specific questions on data gaps and mitigation and adaptation strategies, the Met Office suggests the following points be considered:

**Q5 Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?**

Because of its hostile environment and the presence of sea ice, collection of environmental data in the Arctic presents particular challenges. Therefore, our knowledge of environmental change is more limited than for some other regions. Satellite monitoring provides an important tool to fill some of the gaps, but cannot always observe the near-polar region or in certain seasons. Some important data gaps could in principle be filled using existing or near-proven methods. These include:

- Ocean temperature and salinity (using ice-tethered profilers and autonomous underwater vehicles)
- Arctic clouds and aerosols (detailed process studies using terrestrial stations and ice camps)
- Methane emissions from terrestrial and marine sources (can be monitored using a network of high quality monitoring stations together with modern inversion methods)
- Improving the historical perspective by digitising old observations and interpreting ships’ logs. Cross-calibration of observations from different sources (e.g. ice thickness)
- Improving timeliness of availability of observations to inform near-term climate predictions

The UK’s efforts in these areas need to be well coordinated with international programmes, including the WMO’s Polar Prediction Programme and Polar Climate Predictability Initiative, and the upcoming ‘Year of Polar Prediction’ (2017-19).

**Q6 Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?**

Model projections suggest that further loss of summertime sea ice is likely, across the range of emissions scenarios considered by the Intergovernmental Panel on Climate Change. This implies that adaptation to the threats and opportunities of a changing Arctic environment will be essential. Recent studies with the Met Office’s seasonal prediction system suggest that it may be possible to predict late summer sea ice extent from conditions the preceding spring, with some confidence. If this capability is confirmed by further research it will allow
more confident planning of marine operations for transport, resource exploitation and conservation. This is an area where UK science is world-leading.

September 2014
House of Lords Arctic Committee – supplementary evidence on “sferics” and space weather impacts on communications.

During the evidence session of 28 October 2014, Lord Hunt of Chesterton asked about the use of Met Office lightning detection data (“sferics”) to provide information on the changing Arctic environment. The Met Office offered to supply further detail. Lord Addington was interested in how electronic communications were impacted by the Arctic environment. Space weather can result in geomagnetic variations, aurora, and can affect a number of technologies, including satellite communications and positioning. Space weather predominantly affects the polar regions (the Earth’s northern magnetic pole is located in the Arctic Ocean near the Canadian Arctic Archipelago) and the extent of geomagnetic activity, indicated by the aurora oval, extends to lower latitudes proportionate to the magnitude of the geomagnetic storm. We have therefore also included a short note on the impacts of space weather and the Met Office’s space weather operations centre.

Arrival Time Difference (ATD) thunderstorm detection system

Since the mid-1980s the Met Office has operated a system for remote detection of lightning, by detecting low frequency radio waves that are triggered by lightning pulses and travel long distances (“sferics”). In recent years the system coverage has included most of the globe, although detection efficiency over the Arctic is not as good as in some other regions such as Europe. The data are made available in near-real time to national meteorological services around the world. In the past they have also been made available to the wider research community, although we are not aware of the level of uptake. The observing system is primarily designed to aid immediate detection and short term forecasting, and has evolved over the years as detection efficiency has improved and more detecting stations added. Detecting long term trends using these data, particularly over the Arctic, would therefore be problematic, and we are not aware of any such studies. Geostationary satellite-based systems due for implementation over the next decade or so offer the prospect of improved lightning detection globally.

Space weather impacts on satellites and electronic communications

For most of the time the Earth’s magnetosphere shields satellites from the high energy radiation in space. During significant space weather events this shielding breaks down and geostationary satellites can become exposed and prone to damage. Forty seven satellites suffered temporary outages during the geomagnetic storm in Oct 2003 and two were damaged in 2012. Given the range of spacecraft in operation today the Royal Academy of Engineering estimated 10% of the satellite fleet might suffer from a temporary outage during an extreme event. During space weather radiation storms, the high energy particles flow towards polar regions along magnetic field lines. These produce a ‘Polar Cap Absorption’ (PCA) event producing a HF communications blackout over the polar regions which typically lasts a few days. As satellite communications don’t work at such high latitudes this result in a communication
blackout over the poles resulting in airlines (typically those flying from the US to Asia) having to avoid the polar regions for safety purposes. During a severe space weather event, the increase in the radiation environment is more pronounced near the polar regions, which also increases the risk of Single Event Upsets to aircraft avionics. Global Navigation Satellite Systems (GNSS) often known as Global Positioning Satellites (GPS) would also be impacted making such systems inoperable for a number of days. This will cause operational impacts to industries such as aviation and shipping but could also impact those which rely on GNSS for critical timing information. An extreme geomagnetic storm will also result in an expansion of the Earth’s atmosphere which disrupts the orbit of satellites in a low Earth orbit degrading predictions of their position. It can take several days to reacquire positioning data and regain communication with the satellite.

Radio blackouts and loss of long distance communication

Much our long distance communications relies on the state of a layer in the atmosphere called the ionosphere. HF communications are bounced off the ionosphere to travel beyond line of sight and spacecraft operators communicate with their satellites at VHF, UHF and higher frequencies, which pass through the ionosphere.

During solar flares the intense burst of radiation interferes with the ionosphere, absorbing HF communications signals and causing radio blackouts on the sun-lit side of the Earth. During geomagnetic and solar radiation storms the ionosphere is modified, making it difficult for VHF etc to pass through so communications signals may be degraded in or near the polar regions. As a result mobile satellite communications are of very poor quality or may also be completely unavailable. This impact is at its strongest around dusk and dawn.

Met Office Space Weather Operations Centre

The Government funds the Met Office Space Weather Operations Centre (MOSWOC) which provides operational 24/7 forecasts, alerts and warnings of the impacts of space weather to help protect the UK from the serious threats posed by space weather events. Through our work with other partners in the UK, the Met Office will help to ensure that efforts are coordinated as part of an international programme with the US National Oceanic and Atmospheric Administration (NOAA) National Weather Service Space Weather Prediction Centre (SWPC). The Met Office is also a member of International Space Environment Services (ISES) - international body for space weather - and is a designated Regional Warning Centre.

December 2014
Transcript to be found under Foreign and Commonwealth Office
Ministry of Defence – Written evidence (ARC0002)

I am writing to provide supplementary written evidence for Lord Ashton of Hyde further to the oral evidence session to the House of Lords Select Committee on the Arctic on 09 July 2014.

Lord Ashton had asked: “Because of our presence in Afghanistan, is it true that we have cut back our Arctic training in recent years?”

In response I can affirm that; whilst Defence’s Mountain and Cold Weather Warfare Training - for employment in all potential cold weather operations - has reduced this is due to a reduction in the requirement, as mandated in SDSR10 and subsequent policy documents, rather than an impact of operations in Afghanistan.

I hope that this response satisfactorily answers Lord Ashton’s question.

Yours sincerely,

Martin Molloy
UN, OSCE and Arctic Policy
UK Ministry of Defence

22 July 2014
Q328 My question is really associated with the fact that there has been a lot of submarine activity both in the present and in the past. In the past, this led to a large amount of nuclear waste and old, rotting nuclear submarines. The MOD and others in the UK had a very extensive programme of collaboration to clean this up, because it leads to contamination of the whole of the Arctic area. I just wondered whether, first, this programme is continuing within MOD as part of its Arctic work. Is it funded into the future? Is it done in collaboration with the Arctic Council? I understand that this could be talked about in the Arctic Council, as it is a huge environment problem for the Arctic, or is it discussed solely in bilateral military circles?

Through the UK’s Global Threat Reduction Programme (GTRP), the nuclear aspects of which are managed by the Department of Energy and Climate Change (DECC) and its predecessors (DTI, BERR), the UK provided assistance to help deal with Russia’s nuclear legacy from the Soviet Union, particularly that associated with the nuclear submarine fleet in North West Russia. This work was delivered under the auspices of the Global Partnership against the spread of weapons and materials of mass destruction (The Global Partnership), instituted at the G8 meeting in Kananaskis, Canada, in 2002. Work supported by GTRP to deal with the Soviet nuclear legacy in the Russian Arctic included:

- Funding the defueling and dismantlement of four Russian nuclear-powered submarines (one in conjunction with Norway)
- Funding an underwater survey of the B-159 nuclear-powered submarine, this lies on the bed of the Barents Sea.
- Constructing a store for Spent Nuclear Fuel (SNF) from Russian nuclear-powered icebreakers at the icebreaker fleet base at Atomflot, Murmansk. This work also included security improvements at Atomflot.
- Substantial work to reduce the radiation hazard and construct facilities and provide equipment to enable the safe and secure removal of over 30 tonnes of SNF from Soviet nuclear-powered submarines, stored in poor conditions at the submarine refuelling base at Andreeva Bay, near Murmansk.

With the exception of a small monitoring contract at Atomflot (which ends this year), all UK GTRP work dealing with the Soviet nuclear legacy in North West Russia was completed in 2012.

16 January 2015
1. About NCAS and Declaration of Interests

1.1 The National Centre for Atmospheric Science (NCAS) is one of the Natural Environment Research Council’s (NERC) 6 research centres. The mission of NCAS is to pursue internationally leading research in atmospheric science and to provide national capability and leadership to the UK atmospheric science community. NCAS performs research to increase knowledge of key environmental issues including climate variability and change, weather, and atmospheric composition. NCAS is a distributed organisation in which the research activities are embedded in UK Universities. The Universities with the largest involvement in delivering NCAS research are (in alphabetical order): Cambridge, Leeds, Manchester, Reading and York.

1.2 NCAS receives the majority of its funding from the NERC. Other funding sources include the European Union, businesses, and charitable trusts.

1.3 NCAS collaborates with the UK Met Office under the umbrella of the Joint Weather and Climate Research Programme, which is a strategic partnership between NERC and the Met Office.

1.4 NCAS has Memoranda of Understanding with similar organisations in other countries, e.g. the National Center for Atmospheric Research (NCAR) and the National Oceanic and Atmospheric Administration (NOAA) in the U.S.A.

1.5 The climate directorate of NCAS (NCAS-Climate) provides a core programme of fundamental science, technical support and training to enable world-class scientific research into the global climate system. NCAS-Climate has particular strengths in analysis, understanding and numerical simulation of the processes that govern climate variability and change. NCAS-Climate is based primarily at the Universities of Reading and Cambridge, with additional staff at the Universities of Edinburgh, Leeds & Oxford.

1.6 The weather directorate of NCAS (NCAS-Weather) conducts research on high-impact weather involving cloud microphysics and atmospheric aerosols, dynamical and physical processes in the atmosphere on the local and regional scale. The research specifically addresses the physical processes in convective and other types of clouds and atmospheric flows ranging from building-scale turbulence up to the country-wide influence of the jetstream, cyclones, anticyclones and embedded structures that dominate the weather of the UK. The work is organised in two broad themes: urban meteorology, pollution transport and air quality; and convective processes, severe weather and predictability.

1.7 NCAS provides the UK with research and observation infrastructure to monitor and measure the atmosphere. This includes the UK’s large Atmospheric Research Aircraft (ARA), a highly modified BAE-146 jet aircraft. The ARA is NERC-owned and the service is provided through the Facility for Airborne Atmospheric Measurements (FAAM), a joint operation of NERC/NCAS and the Met Office. NCAS also provides ground-based
atmospheric observing systems such as radar and LIDAR (laser-based remote sensing similar in principle to radar).

2. Response to Committee questions

2.1 Our responses are restricted to those questions where NCAS has relevant expertise and experience.

What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?

2.2 Arctic sea-ice in summer has declined by around 14% per decade since 1979 and is projected to continue to melt in future. However, the decline will not occur smoothly because of natural climate fluctuations. As a consequence, there are likely to be multi-year or decadal periods of rapid melt and similar periods of slower melt (or even increase in ice extent), superimposed on a long-term downwards trend. The decline in winter sea-ice has been smaller but is also projected to reduce in extent.

2.3 The reductions in sea-ice reduce the reflectivity (or albedo) of the Earth’s surface, allowing additional solar energy to be absorbed, thus amplifying the warming.

2.4 The impact of this reduction in sea-ice for UK weather has been much discussed in the scientific literature but there is no consensus yet on the precise impacts. The effects on the ocean may also be important as additional freshwater is added to the Arctic ocean from the sea-ice melt. This has the potential to disrupt existing ocean circulation patterns.

Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities, and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?

2.5 The Intergovernmental Panel on Climate Change (IPCC) 5th Assessment Report (AR5) concluded that it was ‘likely’ (>66% chance) that the Arctic would be reliably (several years in a row) sea-ice free (less than 1 million km$^2$ of ice) in summer by 2050 under a high-emissions scenario (RCP 8.5). However, individual years with ice-free summers are projected to occur earlier.

2.6 An Arctic with less sea-ice will be more open to commercial & tourist shipping activities, as well as mineral & fossil fuel extraction from the ocean floor. NCAS scientists already work with industry on understanding how climate & weather affect businesses, and would be able to do so for the Arctic region also, for example, in understanding when shipping routes may become open.

How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?

2.7 This is a multi-faceted issue. Measuring and interpreting observed changes will remain crucial to help determine this balance. Decisions will need to be informed by the scientific understanding of the changes.
Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?

2.8 We anticipate that the recent decline in summer Arctic ice will result in a rapid growth in environmental issues which need to be addressed. At the centre of the response will be the need for additional data, driven by at least three requirements: the need to predict the course of future environmental changes, the need to adapt UK policy to the changing Arctic environment, and the need to respond to environmental consequences of Arctic development (e.g. accidental releases). For this reason NCAS has undertaken in the past two years to extend the capabilities of the FAAM aircraft to include Arctic navigation capability. The aircraft is still of course limited by airfield availability, but it is now able to operate in polar regions where magnetic compass navigation is unavailable. This extends the UK’s capability to collect Arctic atmospheric data and to respond to incidents with atmospheric/dispersion implications.

2.9 From the available observational data, it is understood that Arctic temperatures are warming at roughly twice the global average. Climate simulations show a similar pattern of warming. However, existing temperature observations over the high latitudes are concentrated over the land regions. There are gaps in our knowledge of how temperatures have changed in the past, and are changing now over the central Arctic. Additional measurements to fill these gaps would aid our understanding considerably.

2.10 Sea-ice concentration has been reliably measured by satellite since around 1979. Before this time, the data is less consistent and relies more on ship observations of the sea-ice edge position. Continuity of the satellite missions is crucial to retain the ability to maintain the monitoring of the ice conditions.

2.11 Sea-ice thickness has previously been measured from limited submarine data, in situ measurements and aircraft flights. It can now be measured from satellite, but this is a relatively new development. However, the thickness cannot be estimated by satellite during the summer months (roughly May until October) because meltwater ponds form on the ice and degrade the ability to detect the edges of ice floes where the thickness is measured. This implies that additional in-situ or aircraft measurements are required over the Arctic to make these measurements during the summer.

2.12 Much additional historical weather & climate data does exist for the Arctic, but is currently in an undigitised form. For example, hand-written ship logbooks contain many millions of measurements of local weather conditions. Projects such as oldWeather.org are now attempting to recover and digitize some of this data, but much more could be done in this area. Reconstructing past variations in sea-ice and Arctic weather would enable more robust statements about the rates of future sea-ice decline.

2.13 As well as long-term data records, there is a need also for detailed measurements to support improvements in the representation of key processes in the models, like surface heat and moisture fluxes or the impact of aerosols on clouds. NCAS has a range of capabilities to contribute to such
work, from the BAe146 Atmospheric Research aircraft through smaller airborne platforms to ground-based instruments which can be deployed from ships or on the ice.

Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?

2.14 The UK (through NCAS, NERC & the Met Office) is a world-leader in monitoring the Arctic, interpreting the observed changes, and developing sea-ice & Arctic forecasting. If accurate and reliable seasonal predictions of Arctic climate can be made then this would enable more robust decisions and local adaptation.

2.15 It is believed that local emissions of ‘black carbon’ (or soot) can settle on the surface, which can cause the snow & ice to darken. This means that less sunlight is reflected and more is absorbed, causing additional surface warming. Reducing emissions of soot would reduce this effect.

Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

2.16 International scientific collaboration will be essential for meeting future challenges in the Arctic region.

September 2014
National Oceanography Centre – Written evidence (ARC0032)

Response coordinator:
Dr. Jennifer Riley

Additional Science Input:
Mr. Steve Hall, National Oceanography Centre
Dr. Richard Sanders, National Oceanography Centre
Dr. Sinhue Torres-Valdes, National Oceanography Centre
Dr. Charlotte Marcinko, National Oceanography Centre
Dr. Stephanie Henson, National Oceanography Centre
Mrs. Jacky Wood, National Oceanography Centre
Professor Ian Wright, National Oceanography Centre
Dr Sheldon Bacon, National Oceanography Centre

In addition Dr Bacon gave oral evidence to the House of Lords Arctic Committee at the hearing on Tuesday 15th July 2014.

About us:
The National Oceanography Centre\(^{131}\) was formed on 1 April 2010 by bringing together into a single institution the Natural Environment Research Council’s activity at the National Oceanography Centre, Southampton (NOCS) and the Proudman Oceanographic Laboratory (POL) in Liverpool. The NOC works in close partnership with the wider marine science community to create an integrated research capability. NOC is the focus for UK oceanography.

Declaration of interests:
NOC welcomes the opportunity to respond to the House of Lords Select Committee on the Arctic call for evidence. The National Oceanography Centre (NOC) is a focal point for UK Marine Science, which is carried out globally including in the Arctic and adjacent oceans. Many of its programmes are funded through public money, accessed via NERC and EPSRC as well as other government departments such as DEFRA.

Evidence Summary:
[1] The Arctic is experiencing significant environmental changes which include:
- Rising atmospheric and oceanic temperatures
- Alterations to the hydrological cycle, and oceanic and atmospheric circulation patterns
- Melting sea and land ice, including changes to the permafrost
- Changes in the extent and thickness and age of Arctic sea ice and planetary albedo
- Ocean acidification and alterations to nutrient regimes and primary productivity

\(^{131}\) www.noc.ac.uk

984
Such changes have potentially global impacts, with real environmental, social and economic implications for the UK. Environmental impacts include:

- ‘Spinning-up’ of the Arctic Ocean through increased ocean atmospheric interactions
- Increased coastal erosion
- Landslides, earthquakes (related to both isostacy and landslides) and tsunami events
- Distribution and occurrence of biological communities, including phytoplankton and fish
- Extreme weather and storm events, including storm surges
- Sea level rise and coastal flooding

Economic and social impacts, in both the near and far field (from the Arctic) include:

- Increased operation of shipping routes across the Arctic in future ice free summers
- Improved access for cable laying, renewable energy resources and mineral wealth.
- Improved commercial fishing opportunities, including UK fishing grounds.
- Disruption to native peoples

Balancing economic development against preservation and protection of the natural environment will be critical as the Arctic continues to change. However, current knowledge about the Arctic is not comprehensive enough to be able to adequately inform decisions on how to best manage this environment. Consequently there is a need for improvements in:

- Continued investment (e.g. through NERC’s Arctic Research Programmes) in sustained scientific research projects (including modeling, observation and paleoclimate studies) in the Arctic and adjacent waters.
- Access to the region, including diplomatic negotiations and use of novel technologies such as marine robotics.
- Access to data and data sharing to maximise value from research projects.

Mitigation and adaptation strategies that the UK could be involved with in the Arctic include:

- Managing invasive species and ship emissions, ensuring compliance of trading partners with international conventions.
- Undertake environmental monitoring in the Arctic region
- Improving understanding of the flux and inventory of methane and CO₂.

The current legal governance of the Arctic is through UNCLOS, of which part 13, focusing on Marine Scientific Research is seen as fit for purpose. The FCO has observer status on the Arctic Council. NOC has a memorandum of understanding with the FCO which will facilitate information flow to and from the council. The UK governments approach, as set out in the Arctic Policy Framework seems appropriate for the future management of, and interaction with the Arctic region.
Consultation Questions:

1. What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?

[7] The Arctic is experiencing significant environmental changes, affecting both continental and oceanic areas. Such changes have potentially global impacts, as the Arctic plays a critical role in the functioning and regulation of Earth's environmental and climatic systems.

[8] The issues and impacts seen in the Arctic are occurring because of a warming climate. Global atmospheric temperatures have increased by 0.8°C in the last 100 years\(^\text{132}\), with larger increases in Arctic regions\(^\text{133}\). These increases have mainly been attributed to rising atmospheric greenhouse gas (GHG) concentrations, released from the anthropogenic combustion of fossil fuels and other processes such as changes in land usage patterns.

[9] GHGs prevent incoming solar radiation, once absorbed by the earth from being radiated back out of the planetary system through the atmosphere. Thus energy is stored in the ocean and atmosphere causing them both to warm.

[10] Rising oceanic and atmospheric temperatures cause further global environmental issues (e.g. sea-level rise, changes to atmospheric circulation patterns and the hydrological cycle). Many of these issues are particularly important in the Arctic and in some cases have climatic feedback effects. Feedback effects further enhance the warming trends observed.

[11] As the Arctic warms the temperature difference between the poles and the mid latitudes decreases. This impacts the jet stream (the high altitude winds which affects the weather patterns in the Northern Hemisphere), slowing its speed. As it slows it tends to meander, and can drift further southwards, significantly impacting the weather in the UK. Likely consequences include heat waves in the summer, increased storminess/heavy rain, or snow in winter. Such extreme events have social and economic impacts for the UK.

1. Ice melt and changes in ocean physics

[12] Warmer atmospheric temperatures are causing an observed reduction in the extent and thickness of Arctic summer sea ice. Summer 2012 resulted in the minimum recorded summer sea ice extent of less than four million square kilometres, a reduction of 45% compared to the 1980’s and 1990’s\(^\text{134}\) coverage. Scientists predict


\(^\text{133}\) http://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=4135

\(^\text{134}\) http://nsidc.org/arcticseainews/2012/09/arctic-sea-ice-falls-below-4-million-square-kilometers/
that over the coming decades the Arctic Ocean will be ice free in summer, however knowing when exactly this will occur is not straightforward\textsuperscript{135}.

[13] This will allow \textit{shipping to operate across the Arctic in summer}, leading to further economic and commercial opportunities in the UK (discussed further in question 2). However, the opening of shipping routes could have adverse environmental effects such as pollution from ship engine exhausts, noise/disturbance/physical impacts on marine life, and difficult-to-clear oil spills (see question 6). There may also be security implications for increased shipping routes in an ice-free Arctic. Given the remoteness of the region, search and rescue coverage may be limited, and large areas of Arctic marine space that fall under national jurisdiction of neighbouring powers may not be freely accessible by naval units without prior permission.

[14] The reduction in ice cover also \textit{reduces planetary albedo} (the reflection of solar radiation), resulting in a dark-coloured ocean that absorbs more heat than the ice, which used to be present. Furthermore, melting of ice and permafrost around the Arctic Ocean rim has resulted in the increase of freshwater inputs and modifications of nutrient inputs to the Arctic Ocean.

[15] \textit{Arctic sea ice is becoming thinner and younger}, as each winter’s growth builds upon less ice from in previous winters. In 1988 26\% of the Arctic was covered in multiyear ice that was over four years old. By 2013 only 7\% of the Arctic was covered by multiyear ice\textsuperscript{136}. Increasing extents of thinner ice will result in quicker melt of sea ice each year, thereby exacerbating the overall Arctic ice loss each summer and increasing wave heights through greater interactions between the atmosphere and surface ocean. This will also affect the wider ecosystem, such as under-ice primary production, species that seek refuge and feed on sea-ice algae and species that rely on the sea ice surface for habitat.

[16] Despite likely future ice-free summers it is predicted that thin annual ice will still be formed in winter for the foreseeable future. Consequently \textit{seabed mountings} will have to be used to moor any equipment all year round in the Arctic – this could include marker buoys for shipping routes and oil and gas installations which will need to be seabed mounted to avoid winter ice damage. \textit{Arctic bathymetry and circulation will need to be thoroughly understood} prior to such installations. In addition the biological communities associated with the reduced environment will need to be understood if effective environmental impact assessments of any future operations are to be undertaken.

[17] The observed water column in the Arctic to date is \textit{highly stratified} with a cold fresh layer at the surface overlying a denser, saltier and cold layer (known as the halocline), which insulates the surface (including sea ice) from warmer waters underneath. The

\textsuperscript{135} www.carbonbrief.org/blog/2013/12/could-arctic-summers-be-sea-ice-free-in-three-years%E2%80%99-time/
\textsuperscript{136} https://nsidc.org/cryosphere/sotc/sea_ice.html
currents in the Arctic are slow\textsuperscript{137}; the waters currently circulate at approximately 1-2 cm/s, almost an order of magnitude slower than the open ocean.

[18] Scientists predict that removing the sea-ice will result in a ‘spinning up’ of the Arctic Ocean\textsuperscript{138}, as there will be a direct link between the ocean and atmosphere. Increased wind stress at the ocean surface will transfer more momentum into the ocean and increase current speeds, to those comparable with the Atlantic Ocean. Turbulence in the ocean will increase which generates ocean mixing and enables heat stored in the deeper waters to reach the surface ocean. This rising warmer water acts as a feedback promoting further ice loss.

[19] Reductions in the sea ice extent are also exposing more coastal areas, previously covered by ice all year round. This exposure, coupled with increased current speeds is likely to result in higher rates of coastal erosion, which will need consideration in a future ice free Arctic.

[20] Despite representing 1\% of the global ocean, the Arctic Ocean receives 10\% of the global total freshwater input, making it prone to changes in the hydrological cycle at high northern latitudes. Freshwater sources come from melting sea and land ice melt, including the melting of permafrost\textsuperscript{139}.

[21] Thawing of the permafrost is predicted to release methane into the atmosphere\textsuperscript{140}, which was previously stored in the ice as methane clathrates. Methane is a particularly strong greenhouse gas. Such methane releases are likely to cause relatively short periods of further warming in the atmosphere as methane has a residence time of approximately 10 years in the atmosphere\textsuperscript{141}. Historical evidence of such short warming periods has been observed in the paleoclimate record.

[22] The dissociation of methane clathrates in the continental shelf under the sea may cause sediments on the shelf slope to destabilise\textsuperscript{142}. Such destabilisation may trigger tsunami events. Evidence of such a tsunami event has been observed in the sediment core paleoclimate record off the coast of Norway\textsuperscript{143}. Further research from a paleo, contemporary and future modelling perspective will enable better understanding of the impacts of dissociation.

[23] Land ice, such as the Greenland Ice Sheet, is also melting and further contributing to freshwater input to the Arctic Ocean. The weight of the ice on land deforms the Earth’s crust and mantle. As the weight of the ice is removed the crust and mantle are able to rebound. This is known as isostatic rebound and has the potential to cause earthquakes and trigger tsunami events. Submarine landslides near to the UK that are

\textsuperscript{137} http://nsidc.org/cryosphere/seacie/processes/circulation.html
\textsuperscript{138} www.nature.com/ngeo/journal/v5/n3/full/ngeo1379.html
\textsuperscript{139} http://onlinelibrary.wiley.com/doi/10.1029/2009JD013060/abstract
\textsuperscript{140} https://nsidc.org/cryosphere/frozenground/methane.html
\textsuperscript{141} http://www.sciencedirect.com/science/article/pii/S0921818106001299
\textsuperscript{142} http://projects.noc.ac.uk/landslide-tsunami/submarine-landslides-and-tsunamis
\textsuperscript{143} www.sciencedirect.com/science/article/pii/S0025322704002713
Large enough to generate tsunamis have been very rare and it is thought that only six have occurred beneath the Norwegian and Greenland Seas during the last 20,000 years. However, more research is needed to better understand the mechanisms triggering landslide occurrence and their likelihood for tsunami generation and propagation towards the UK.

[24] *Increased riverine inputs and terrestrially derived organic matter* are being observed across the Arctic from melting land ice. This is affecting the quality and quantity of nutrient inputs with impacts on primary production across the Arctic shelf. Increased organic matter in the water column impacts the optical properties of the water, causing light to be absorbed much more rapidly with depth\(^{144}\). This reduces the light available to fuel primary production, impacting the biological communities of the Arctic. Organic matter in the ocean also accelerates the heating of surface waters, exacerbating sea ice melt and reducing stratification\(^ {145}\).

[25] As the sea ice melts it is likely that a continued freshening of the Arctic Ocean will be observed, the impacts of which are uncertain. Scientific evidence suggests that such freshening will reduce the density of the water in the Arctic, slowing the rate of deep-water formation. Reduction in the amount of deep-water formation is likely to slow down the Thermohaline Circulation (THC)\(^{146}\) in the global ocean and ultimately decelerate the distribution of heat around the planet. In the UK the THC is responsible for keeping the climate significantly warmer than countries at similar latitudes (e.g. Canada and the Southern tip of Greenland). A slowdown of the THC will therefore cause an overall cooling of the climate in the UK with social and economic impacts as winters become more severe\(^{147}\).

[26] *Global sea levels are predicted to rise* due to ice melt in the Arctic. Increased freshwater inputs to the Arctic from melting land ice (including permafrost) will contribute to rising sea levels. Current research suggests that the Greenland Ice Sheet is melting at a rate of 0.2± 0.1 mm/yr\(^ {148}\) and if entirely melted will contribute approximately 7m to global sea level\(^ {149}\). The transfer of a global sea level rise to regional seas and coastal sea level rise is complicated and is dependent on varying factors. Sea level rise will threaten low-lying areas around the globe, increasing the occurrence and rate of beach erosion, coastal flooding, and contamination of freshwater supplies\(^ {150}\). Much of the global population lives in coastal areas and may become threatened by rising sea levels in the future. As an island rising sea levels are something that the UK will particularly have to be prepared for and devise mitigation strategies against in the future.
2. Changes in ocean chemistry and the problem of Ocean Acidification.

[27] Due to a lack of observations currently (because of a hostile and logistically challenging environment) the Arctic biogeochemical system and its function is not well understood. This makes it difficult to predict what future changes will occur and what impact they will have on CO$_2$ uptake, Ocean Acidification and food webs etc. The problem is exacerbated due to a lack of a long ‘baseline’ (i.e. observations over many years/decades), to differentiate what is normal response of the system to natural variability and what is due to climate change.

[28] The cold waters of the Polar Regions are able to absorb more atmospheric CO$_2$ than warmer regions. This is important for storage of anthropogenic CO$_2$ in the ocean. The Arctic is a region of deep-water formation, thus any CO$_2$ absorbed in high latitude waters is transported down to depth and removed from contact with the atmosphere for potentially thousands of years. A warming climate is likely decrease the deep-water formation and CO$_2$ absorption in the Arctic, with negative implications for anthropogenic carbon storage in the ocean.

[29] Uptake of CO$_2$ also alters the ocean chemistry, making waters more acidic. Arctic waters are currently experiencing widespread and rapid ocean acidification (OA). Ocean acidification will affect many biological processes including calcification of coral and marine plankton species.

[30] The biological impacts of OA in the Arctic are likely to be significant, however current research is insufficient to precisely assess the nature and extent of Arctic ecosystem vulnerability. However OA will likely alter fish species composition in the Arctic and affect Arctic fisheries\(^\text{151}\).

[31] Despite the importance of the Arctic for CO2 uptake, little is known about the sinking of carbon, particularly in its organic form in the Arctic. To date only a handful of measurements have examined carbon export in the Arctic region. NOC/NERC scientists have been involved with international research programmes such as EURO-BASIN\(^\text{152}\), working with partners in Canada, North America and Europe to improve observations of carbon export in the Arctic.

[32] NERC’s Ocean Acidification Research Programme is a five-year collaborative programme with a budget of £12m funded by NERC, the Department for Environment, Food & Rural Affairs (Defra) and the Department of Energy & Climate Change (DECC). The overall aim of the programme is to provide a greater understanding of the implications of OA and its risks to ocean biogeochemistry, biodiversity and the whole Earth system.

3. Changes to the Biological Community from High to Low Trophic Levels

\(^\text{151}\) www.amap.no/documents/doc/Arctic-Ocean-Acidification-2013-An-Overview/1061
\(^\text{152}\) http://www.euro-basin.eu/
The distribution and occurrence of biological communities will be altered by rising water temperatures, sea ice melt, and changing nutrient inputs from riverine runoff, as well as increased human activities. Highly specialised species dependent on the Arctic sea ice for their survival will likely become endangered or extinct. However, other species will thrive. This change is already evident with declines in populations of polar bears in some Arctic regions. Furthermore, new species are now being caught in trawling nets in the Arctic, including North Atlantic mackerel and cod. Changes in fish stocks in the Arctic will have economic and commercial impacts (discussed in question 2).

The UK has a strong research community examining the driving factors and impacts of a changing Arctic climate. However, such research needs continued investment to ensure that data continues to be collected at high enough spatial and temporal resolution to be able to document the rapid changes that are occurring. Some elements of the Arctic system are currently under observed especially biological systems (discussed further in question 5).

Enhanced riverine inputs (as discussed previously) are causing increases in nutrient concentrations in the Arctic. However, little is known about their fate. NOC scientists have undertaken pioneering baseline research, which suggests that, for unknown reasons, nitrate inputs to and outputs from the Arctic balance. However, the Arctic acts as a large source of phosphate and silicate. This implies that the Arctic plays a key and poorly understood role in shaping North Atlantic planktonic ecosystems.

2. Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities, and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?

Changes in the Arctic are likely to lead to new economic and commercial opportunities. As ice melts and summers become ice free in the Arctic Ocean greater commercialisation opportunities will arise through the instatement of regular shipping routes, service cable laying and access to natural resources including energy (e.g. oil and gas) and mineral wealth.

Similarly with the expansion of fishing grounds north into Arctic waters there is potential for increased commercial fishing opportunities. The Arctic waters are already highly lucrative with respect to fisheries. In 2002 fisheries of the circumpolar north accounted for more than 10% of the worlds wild fish catch and more than 5% of the crustacean catch.

153 www.economist.com/node/21556798
154 http://wwf.panda.org/what_we_do/where_we_work/arctic/wildlife/polar_bear/popolation/
155 http://icesjms.oxfordjournals.org/content/62/7/1360.full
156 http://noc.ac.uk/news/pioneering-study-calculates-arctic-ocean-nutrient-budget
157 www.amap.no/documents/doc/Arctic-Ocean-Acidification-2013-An-Overview/1061
Environmental changes in the Arctic can have far field effects away from the true Arctic environment. The circulation in the ocean is three dimensional, and as such, Arctic derived waters can be found at depth outside the geographical limits of the Arctic. A prime example of this is the cold Arctic water flowing five miles west of Shetland at 500 m depth\(^\text{158}\). This cold Arctic current is an important feature, sustaining highly productive fishing grounds for the UK. Thus any changes in the Arctic could also have economic and commercial implications for UK fisheries.

3. How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?

Economic development must be balanced against preservation and protection of the natural environment. In order to be able to protect an environment the baseline against which change is being measured must be known. In the Arctic the baseline is already changing so it will be difficult to assess the impact of any environmental protection measures implemented. In addition, the hostile and logistically challenging environment presents significant challenge in observing the Arctic marine system.

Furthermore the scientific evidence is currently not sufficient to be able to say whether the change in the Arctic region will be “good” or “bad” overall. Clearly some species will lose out to Arctic climate change, whilst others will gain.

The UK marine science community has access to the Natural Environmental Research Council (NERC)’s significant capabilities in polar ocean observations. Current observational infrastructure includes ice strengthened research vessels, such as the James Clark Ross\(^\text{159}\) capable of working in ice-covered waters (up to 1 m thick) and the ability to deploy Autonomous Underwater Vehicles (AUVs) under ice to collect data and operate beneath the ice shelf. Further capital investment in the development of novel autonomous technologies would further enhance our capabilities to access and measure the changing Arctic environment\(^\text{160}\).

Furthermore NERC has invested resources into sustained observation programmes. These include the Extended Ellet Line\(^\text{161}\), which measures ocean properties in the NE Atlantic where waters flow into and out from the Arctic region and which therefore establishes a baseline against which changes in the Arctic and adjacent waters can be measured and MASOX (Monitoring Arctic Seafloor – Ocean Exchange) where NOC/NERC have previously provided instrumentation for a sustained seafloor observatory to monitor methane outputs in the Svalbard archipelago\(^\text{162}\).

\(\text{158}\) www.scotland.gov.uk/Publications/2011/03/16182005/25
\(\text{159}\) http://www.antarctica.ac.uk/living_and_working/research_ships/rrs_james_clark_ross/index.php
\(\text{160}\) http://noc.ac.uk/f/content/downloads/2013/Scanning%20the%20Horizon-reduced.pdf
\(\text{161}\) www.noc.ac.uk/ocean-watch/open-ocean/extended-ellett-line
\(\text{162}\) http://noc.ac.uk/news/monitoring-methane-svalbard
[43] Given that rapid change can be expected, **there is a long-term need for a broad spectrum of scientific observations by the international science community**, using both traditional research ships and novel technologies such as marine robotics. Improvements in such observations across the Arctic will help scientists to better understand the processes currently occurring and validate Arctic models for more accurate future predictions of changes.

[44] We can anticipate an acceleration of hydrocarbon extraction in the Arctic. However society and **the oil and gas sector will face formidable challenges** in locating, containing and removing under-ice oil spills should they occur. The monitoring and detection of oil spills under ice is difficult due to the inability of satellite remote sensing to track spills and biological remediation processes are slower due to the lower sea temperature. If heavy specialist equipment is not pre-positioned in the region there may be considerable delays in accessing the location of a spill, particularly in winter months, and personnel will need to be trained in oil spill removal techniques that are effective at low temperatures, and in the winter months would need to be undertaken in darkness. New research to understand oil spill dispersion and degradation in polar waters may be required.

4. What are the human aspects of the expected climatic and economic changes in terms of local populations, current and future?

[45] The expected changes will affect local populations in several ways including altering fisheries and climate and opening shipping routes and commercial activity.

5. Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?

[46] **To date there is insufficient data on the Arctic to make informed policy decisions.** However there is a growing body of scientific evidence which may be of use when making short term policy decisions relating to the Arctic. Nevertheless, **scientific understanding of on-going environmental change is needed** to realise sound long-term policies. The UK is in a good position to help deliver this knowledge, with research expertise in a wide range of areas including, modelling, observation, and paleoclimate studies.

[47] **NERC has an Arctic research programme**[^163] which aims to consolidate and enhance research capabilities and address scientific uncertainties. £15 million is being invested into the five-year programme, over the period 2010-2015. To date the NERC Arctic programme has funded the following marine related projects, which include NOC expertise:

[^163]: [www.nerc.ac.uk/research/funded/programmes/arctic/](http://www.nerc.ac.uk/research/funded/programmes/arctic/)
- **TEA-COSI** (The Environment of the Arctic: Climate, Ocean and Sea Ice) – aiming to deliver a substantial enhancement in the understanding of key Arctic ocean and sea ice processes and their impact on the Arctic and wider climate system, in both the present and future\(^{164}\).

- **SEATS** (Submarine Estimates of Arctic Turbulence Spectra) – aiming to provide insight into how the close links between fluid dynamic scales and biogeochemical cycles will change under conditions of an increasingly ice-free Arctic\(^{165}\).

- **Will climate change in the Arctic increase the landslide-tsunami risk to the UK?** – This project aims to clarify the frequency and timing of major Arctic submarine slides during the last 20,000 years, and determine which generated far-field tsunamis\(^{166}\).

[48] Despite such funding current scientific knowledge is not comprehensive enough to be able to adequately inform policy decisions. As such, continued investment into marine scientific research in the Arctic is essential. Some of the key gaps and problem areas include:

- **State of the art models**, predicting the occurrence and position of Arctic currents, have been developed which are validated through ocean observations\(^{167}\). Given likely future changes in circulation there is a need for **investment in both observations and modelling** to enable robust predictions of future conditions to be made.

- **Access to the region** – Novel technologies such as unmanned autonomous vehicles (e.g. Autosub\(^{168}\)) will help scientists to gain better access to the Arctic in the future. Access into the Arctic can be further enabled through the use of shared Infrastructures such as the international research base at Ny-Ålesund on the Svalbard archipelago\(^{169}\) and via bartering for ship time\(^{170}\). Some regional powers exercise much higher levels of control over access to the Exclusive Economic Zones (EEZ) and may extend their continental shelf claims. The region is subject to a high likelihood of geopolitical change, which may increase the risk of reduced access to Arctic waters for marine scientific research.

- **Earth Observations** – Satellites are key for providing data on changes in ice extent and variations in sea level, sea surface temperature and primary productivity. Through the UK’s contributions to the European Space Agency (ESA) we are able to help inform data product development and get access to data

\(^{164}\) [http://projects.noc.ac.uk/tea-cosi/](http://projects.noc.ac.uk/tea-cosi/)

\(^{165}\) [www.nerc.ac.uk/research/funded/programmes/arctic/arctic-awards.pdf](http://projects.noc.ac.uk/tea-cosi/)

\(^{166}\) [www.nerc.ac.uk/research/funded/programmes/arctic/arctic-awards2.pdf](http://projects.noc.ac.uk/tea-cosi/)


\(^{168}\) [http://noc.ac.uk/research-at-sea/nmss/nmep/autosubs](http://noc.ac.uk/research-at-sea/nmss/nmep/autosubs)

\(^{169}\) [www.arctic.ac.uk/infrastructure/international-facilities/international-stations/](http://noc.ac.uk/research-at-sea/nmss/nmep/autosubs)

\(^{170}\) [http://noc.ac.uk/research-at-sea/reasons-set-sail/international-working](http://noc.ac.uk/research-at-sea/reasons-set-sail/international-working)
from specific Earth Observation (EO) missions. The next series of ESA EO satellites (the Sentinel series) will help fill in some gaps in our knowledge in the Arctic region through the launch of the Sentinel Series of satellites. However, these will still be restricted in their polar coverage. The current CryoSat mission only covers up to 88° North. Improvements in satellite coverage would enable more comprehensive data collection. The Cryosat satellite can deliver precise information on changes in ice thickness. Further, the Jason-2 and -3 satellites allow measurements of global sea-surface height, to an accuracy of a few centimetres every 10 days, which allows ocean circulation and mean sea level to be determined. This data is used in support of weather forecasting, climate monitoring and operational oceanography\textsuperscript{171}. The proposed Jason-CS satellite missions will enhance these capacities. Ongoing support of these EO science programmes, through encouragement of Arctic observing capacity, is necessary to better understand the future impacts of change in the Arctic.

- **Tide Gauge network and sea level measurements** – The UK has an effective tide gauge network\textsuperscript{172} that helps to track variations in the tidal cycle and also support research on sea levels changes. The NOC also hosts the Permanent Service for Mean Sea Level\textsuperscript{173}, which collects, publishes, analyses and interprets global sea level data from tide gauges. Improvements need to be made in the tide gauge network globally by ground truthing their positions with in-situ GPS data. However the existing tide gauge network in the Arctic is not adequate to provide the full range of data required to give detailed information about the rate of sea level rise, storm surges, or tsunami incidence. Canada have cut their tide gauge network, and Russia is understood to have not invested in the region.

- **Biogeochemical data** – Much biological and chemical data is derived from scientists physically sampling and analysing water and organisms post collection. In situ data collection could be facilitated by novel technologies such as \textit{lab on a chip technologies}\textsuperscript{174} (which measure chemical properties of the ocean) and \textit{biological sensors}\textsuperscript{175} (which miniaturise technologies currently reliant on large instrumentation), which could be used in conjunction with autonomous underwater vehicles.

- **Access to data** – Given that data is difficult to collect and is not fully comprehensive, it is vital that collected data is made freely available though data centres such as the British Oceanographic Data Centre\textsuperscript{176} and European Marine Observation and Data Network\textsuperscript{177}. International connections made through

\textsuperscript{171} www.esa.int/Our_Activities/Observing_the_Earth/Copernicus/Altimetry_missions
\textsuperscript{172} www.noc.ac.uk/science-technology/climate-sea-level/sea-level/tide-gauges
\textsuperscript{173} www.psmsl.org/about_us/overview/
\textsuperscript{174} www.noc.ac.uk/science-technology/research-groups/ote/instruments-sensors/chemical-microsensors
\textsuperscript{175} www.noc.ac.uk/science-technology/research-groups/ote/instruments-sensors/biological-microsensors
\textsuperscript{176} www.bodc.ac.uk/
\textsuperscript{177} www.emodnet.eu/
science coordination programmes (e.g. IOC\textsuperscript{178}, EuroGOOS\textsuperscript{179} and WCRP programmes\textsuperscript{180}) also facilitate access to international datasets.

[49] The European Marine Board has made strategic recommendations regarding future investments in Arctic Science in its position paper, ‘Navigating the Future IV’\textsuperscript{181}. Implementing these recommendations through appropriately allocated funding will ensure long term benefits from Arctic research, and that polar resources are sustainably used in the future.

6. Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?

[50] Some potential areas where local mitigation strategies could be implemented but require further research or compliance with international regulations, include:

- **Management of invasive species** – Ballast water in ships is known to transport non-native species from one ocean region to another, causing native species to become endangered or extinct through competition for resources. The impacts of invasive species can be managed through *ensuring compliance with international conventions* such as the Ballast Water Convention\textsuperscript{182} from both UK trade and its international partners.

- **Undertaking environmental monitoring** – as coastal (port and harbour) and offshore (oil/gas) infrastructures are built there will be a need to ensure environmental compliance and monitoring is undertaken to protect the environment. The UK could help with this by utilising its scientific expertise in both industry and academia.

- **Minimising emissions from ships** – emissions from ships transiting through the Arctic can be a source of pollution (e.g. soot particles from low grade fuel oil coating sea ice and changing its reflectivity resulting in a warming feedback effect). It will be important to mitigate against such pollution by ensuring compliance with new ship fuel regulations\textsuperscript{183}.

- **Oil spill modelling** – if oil and gas exploration was to be undertaken in the Arctic there would need to be contingency and mitigation measures implemented for the occurrence of an oil spill. Scientific research (through improved understanding of circulation, degradation and natural remediation rates and

\textsuperscript{178} http://ioc-unesco.org/
\textsuperscript{179} http://eurogoos.eu/events/eurogoos-annual-meeting-2014/
\textsuperscript{180} www.wcrp-climate.org/
\textsuperscript{181} www.marineboard.eu/science-foresight/navigating-the-future
\textsuperscript{182} http://globallast.imo.org/index.asp?page=mepc.htm
\textsuperscript{183} www.imo.org/OurWork/Environment/PollutionPrevention/AirPollution/Pages/Nitrogen-oxides-(NOx)-%E2%80%93-Regulation-13.aspx
biogeochemical impacts in polar waters) and modelling capacity could help to better understand and predict the path of contamination in the region.

- **Improving understanding of the flux and inventory of methane and CO₂** in and out of Arctic Shelf storage (methane clathrates) and interactions/feedback with Arctic Climate change. This is an area where the UK science community already has a lead.

7. Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

[51] There are many international governance arrangements already in place for dealing with the Arctic, including the Arctic Council (as discussed in question 3) as well as international science coordination platforms (as discussed in question 5).

[52] The legal governance for **undertaking international marine scientific research (MSR) in the Arctic is through UNCLOS** (United Nations Convention on the Law of the Sea). Part 13 sets out the general provisions for MSR including ensuring provision for marine data acquisition, data dissemination and the collaborative workings of large-scale international programmes184. Although there is discussion internationally focusing on whether UNCLOS part 13 is fit for purpose, it is our view that UNCLOS part 13 should be maintained and is suitable to regulate access into the Arctic.

[53] In order to undertake MSR in international waters **diplomatic clearances** need to be gained to enable legal access into exclusive economic zones (EEZ) according to UNCLOS. EEZ extend 200nm offshore and grant the sovereign state special rights over allowing exploration and use of marine resources, including energy production from water and wind185. Furthermore nations have access to the continental shelf up to 350 nm offshore186, for which diplomatic clearance is also needed for research activities accessing the seabed. Through NERC’s national capability funding of the National Marine Facility Sea Systems (NMFSS), staff at NOC have the expertise and knowledge to advise FCO to facilitate the UK processing of diplomatic clearances for MSR187 by other member states and to inform the case for UK applications. Our experience is that states are being more rigorous in their assessment of MSR applications and we expect this will become increasingly an issue in the Arctic.

[54] The **UK could also play a key role in scientific knowledge exchange and capacity development.** Such work could be developed between the scientific community and:

187. www.noc.ac.uk/research-at-sea/nmfss/research-ship-management-group
• Local communities dependant upon the region for their survival who may require education about the observed and predicted changes and impacts.

• Companies and corporations wishing to exploit the economic opportunities in the Arctic. This could include helping energy companies understand seabed habitats for cable laying and energy acquisition activities, and ensuring environmental damage from shipping routes and harbour infrastructures are minimised.

8. How effectively does the UK interact with Arctic governance structures? Is the UK Government’s approach, as set out in the Arctic Policy Framework, proportionate and appropriate?

[55] The Arctic Council is the major coordinating body for Arctic rim countries and allows Arctic Circle countries and intergovernmental organisations observer status. The UK has permanent observer status granted which is coordinated through the Foreign and Commonwealth Office (FCO). The science community, in particular NOC, has a memorandum of understanding with the FCO, thus scientific input can be provided to the FCO and hence presented in the Arctic Council fora.

[56] The International Maritime Organisation (IMO) is an international regulating authority for the maritime industry. The IMO membership is constructed around 170 member states (of which the UK has membership), and various intergovernmental organisations and NGOs. Any future maritime activities taking place within the Arctic will therefore have to be compliant with IMO standards.

[57] UNCLOS is the regulatory framework through which the seas are governed. From a Marine Scientific Research perspective, UNCLOS is currently fit for purpose in guiding Activities. This is in agreement with the current UK governments approach as set out in the Arctic Policy Framework.

[58] Generally the Arctic Policy Framework seems proportionate and appropriate for future management of, and interaction with, the Arctic region. Working within the Convention on Biological Diversity Regulations, and with coordinating bodies such as OSPAR, will enhance environmental protection along with the facilitation and coordination of scientific research.

[59] From a MSR perspective, it is critical to remember that the Arctic comprises a large ocean surrounded by landmasses. It is therefore important that both terrestrial and marine Arctic research is supported to allow a full picture of system functioning and change to be obtained.

[60] The responses provided in this inquiry are based on our best available scientific knowledge. We hope that the responses provided to this inquiry are of use. If any further information is needed please do not hesitate to contact us, via the response coordinator.
September 2014
## Introduction

1. The Natural Environment Research Council (NERC) is one of the UK’s seven Research Councils. It funds and carries out impartial scientific research in the sciences of the environment and trains the next generation of independent environmental scientists. Details of NERC’s research centres and research programmes are available at www.nerc.ac.uk.

2. This response has taken into account input from the Plymouth Marine Laboratory (PML) and NERC’s National Oceanography Centre (NOC).

3. The National Oceanography Centre was formed on 1 April 2010 by bringing together into a single institution the Natural Environment Research Council’s activity at the National Oceanography Centre, Southampton (NOCS) and the Proudman Oceanographic Laboratory (POL) in Liverpool. NOC works in close partnership with the wider marine science community, and carries out research globally. NOC receives public funding via NERC and the Engineering and Physical Sciences Research Council (ESPRC), as well as through government departments such as the Department for Environment, Food and Rural Affairs (DEFRA).

4. Plymouth Marine Laboratory was established in 1988 to undertake interdisciplinary research that brings together areas of scientific expertise to address key scientific and socially relevant questions relating to the marine environment. PML collaborates with more than 250 academic, governmental and industrial partners from 50 countries every year. In the UK, PML is a designated National Capability Delivery Partner for the Natural Environment Research Council.

### Question 1: What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?

5. The Arctic is experiencing significant environmental changes, affecting both continental and oceanic areas. Such changes have potentially global impacts as the Arctic plays a critical role in the functioning and regulation of Earth’s environmental and climatic systems. The UK has a strong research community examining the driving factors and impacts of a changing Arctic climate.

6. There has been an observed reduction in the extent and thickness of Arctic summer sea ice. Summer 2012 resulted in the minimum recorded summer sea ice extent of less than four million square kilometres, a reduction of 45% compared to the 1980s and 1990s coverage. Scientists predict that in the future the Arctic Ocean will be ice free in summer.

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188 www.noc.ac.uk
189 http://www.pml.ac.uk/
190 http://nsidc.org/arcticseainews/2012/09/arctic-sea-ice-falls-below-4-million-square-kilometers/
7. Reductions in the sea ice extent are also exposing more coastal areas previously covered by ice all year round. In addition, increased freshwater inputs to the Arctic from melting land ice (including permafrost) will contribute to rising sea levels.

8. The cold waters of the Polar Regions are able to absorb relatively higher concentrations of atmospheric CO$_2$ than warmer regions. A warming climate may decrease the CO$_2$ absorption in the Arctic, with negative implications for anthropogenic carbon storage in the ocean.

9. Uptake of CO$_2$ also alters the ocean chemistry, making waters more acidic. PML/NERC scientists have been leading ocean acidification research on the biological and biogeochemical impacts from ocean acidification in the high Arctic alongside European, Canadian and America colleagues in programmes such as the EPOCA$^{191}$ and CAS$^{192}$.

10. NERC’s Ocean Acidification Research Programme is a five-year collaborative programme with a budget of £12m funded by NERC, the Department for Environment, Food & Rural Affairs (Defra) and the Department of Energy & Climate Change (DECC). The overall aim of the programme is to provide a greater understanding of the implications of ocean acidification and its risks to ocean biogeochemistry, biodiversity and the whole Earth system.

11. The UK has a strong Earth Observation (EO) satellite programme. The Cryosat satellite delivers precise information on changes in ice thickness. In addition the Jason-2 and -3 satellites allow measurements of global sea-surface height to an accuracy of a few centimetres every 10 days, which allows ocean circulation and mean sea level to be determined. These data are used in support of weather forecasting, climate monitoring and operational oceanography$^{193}$.

Question 2: Will changes in the Arctic lead to new economic and commercial opportunities? What are these opportunities, and how might they be delivered? What should be the role of the UK Government, of British businesses and of other sections of civil society?

12. Changes in the Arctic such as the reduction in sea ice in the summer and warming conditions are likely to impact commercial development opportunities.

13. Environmental changes in the Arctic can have far field effects away from the true Arctic environment. The circulation in the ocean is three dimensional and as such Arctic derived waters can be found at depth outside the geographical limits of the Arctic. An example of this is the cold Arctic water flowing five miles west of Shetland at 500m depth$^{194}$. This cold Arctic current sustains highly productive fishing grounds for the UK. Thus, any changes in the Arctic could also have economic and commercial implications for UK fisheries.

Question 3: How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?

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$^{191}$ http://ec.europa.eu/research/index.cfm?pg=newsalert&lg=en&year=2011&na=na-110511
$^{193}$ www.esa.int/Our_Activities/Observing_the_Earth/Copernicus/Altimetry_missions
$^{194}$ www.scotland.gov.uk/Publications/2011/03/16182005/25
14. The UK already plays a key role in world-wide environmental and oceanographic monitoring and assessment.

15. The Natural Environmental Research Council (NERC) has significant capabilities in polar ocean observations. Current observational infrastructure includes the ice strengthened research vessel the James Clark Ross\(^{195}\) capable of working in ice-covered waters (up to 1 m thick), and the ability to deploy Autonomous Underwater Vehicles (AUVs) under ice to collect data. Future capital investment in a new Polar Research ship, which will have ice-breaking capacity, will further enhance NERC’s capabilities in the Arctic.

16. Furthermore, NERC has invested resources into sustained observation programmes. These include the Extended Ellet Line\(^{196}\) which measures ocean properties in the NE Atlantic where waters flow into and out from the Arctic region and which therefore establishes a baseline against which changes in the Arctic and adjacent waters can be measured and MASOX (Monitoring Arctic Seafloor – Ocean Exchange) where NERC/NOC provided instrumentation for a deep sea sustained observatory to monitor methane outputs in the Svalbard archipelago\(^{197}\).

17. NERC supports a range of research that can provide evidence to inform decisions about the potential environmental impact of economic development activities, in order to promote economic growth with responsible environmental management.

**Question 4: What are the human aspects of the expected climatic and economic changes in terms of local populations, current and future?**

**Question 5: Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?**

18. There is a growing body of evidence from data about the certain specific changes that are occurring within the Arctic region (ice melt and associated processes) that can be used to inform policy decisions. The UK has research expertise in a wide range of areas, including modelling, observation and paleoclimate research.

19. The UK has a large and active community of Arctic researchers funded by NERC. NERC supports an Arctic Office, hosted by the British Antarctic Survey, to coordinate UK research and logistics in the Arctic region, including the management of the UK Arctic Research Station at Ny-Ålesund on Svalbard.

20. NERC also has an Arctic Research Programme\(^{198}\) which aims to consolidate and enhance research capabilities and address scientific uncertainties. The objectives of the programme are to improve our capability to predict changes in the Arctic, particularly over timescales of months to decades, including regional impacts and the potential for feedbacks on the global Earth System. £15 million is being invested into the five-year programme over the period 2010-2015.

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\(^{195}\) http://www.antarctica.ac.uk/living_and_working/research_ships/rrs_james_clark_ross/index.php

\(^{196}\) www.noc.ac.uk/ocean-watch/open-ocean/extended-ellett-line

\(^{197}\) http://noc.ac.uk/news/monitoring-methane-svalbard

\(^{198}\) www.nerc.ac.uk/research/funded/programmes/arctic/
Question 6: Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make?

21. Much of NERC's research in the Arctic is concerned with understanding the potential impacts of climate and environmental change and so can be used to inform decisions around mitigation and adaptation.

Question 7: Are current international governance and security arrangements appropriate for dealing with anticipated challenges in the Arctic? How should the UK support the Arctic states in their stewardship of the region?

22. The legal governance for undertaking international marine scientific research (MSR) in the Arctic is through UNCLOS (United Nations Convention on the Law of the Sea). Part 13 sets out the general provisions for MSR including ensuring provision for marine data acquisition, data dissemination and the collaborative workings of large-scale international programmes\(^{199}\).

23. In order to undertake MSR in international waters, diplomatic clearances need to be gained to enable legal access into exclusive economic zones (EEZ) according to UNCLOS. EEZ extend 200 nm offshore and grant the sovereign state special rights over allowing exploration and use of marine resources, including energy production from water and wind\(^{200}\). Furthermore, nations have access to the continental shelf up to 350 nm offshore\(^{201}\), for which diplomatic clearance is also needed, for research activities accessing the seabed. Through its national capability funding of the National Marine Facility Sea Systems (NMFSS), staff at NOC have the expertise and knowledge to facilitate the processing of diplomatic clearances for MSR\(^{202}\).

Question 8: How effectively does the UK interact with Arctic governance structures? Is the UK Government’s approach, as set out in the Arctic Policy Framework, proportionate and appropriate?

24. The Arctic Council is the major coordinating body for Arctic rim countries and allows Arctic Circle countries and intergovernmental organisations observer status. The UK has permanent observer status granted, which is coordinated through the Foreign and Commonwealth Office (FCO). The science community, in particular NOC, has a memorandum of understanding with the FCO, thus scientific input can be easily provided to the FCO and into the Arctic Council, including through a number of Arctic Council Working Groups, which specifically have UK scientist participation (PML/NOC/NERC).

September 2014


\(^{202}\) [www.noc.ac.uk/research-at-sea/nmfss/research-ship-management-group](http://www.noc.ac.uk/research-at-sea/nmfss/research-ship-management-group)
Introduction

1. The Arctic Office appreciates the opportunity to provide written evidence to the Committee. It shares the views expressed in written contributions from British Antarctic Survey and the Natural Environment Research Council.

2. One of the outcomes of the International Polar Year 2007-2008 was recognition that UK research in the Arctic Region was not as coordinated as that undertaken, primarily through the British Antarctic Survey, in the Antarctic. To help address this issue the Arctic Office was established by Natural Environment Research Council (NERC) in 2009 and is hosted by the British Antarctic Survey (BAS). The Office is charged with supporting the UK Arctic research community, raising the profile of UK in the Arctic Region, advising UK government departments and building international cooperative links. It has a website at www.arctic.ac.uk. And is closely associated with the major NERC funded Arctic Research Programme (ARP) which has a website at arp.arctic.ac.uk.


4. The Office has organised a significant UK presence in all the IASC scientific working groups and supported UK involvement in more focussed Arctic coordination bodies, such as ISIRA (International Science Initiative in the Russian Arctic) as well as supporting the UK Polar Network (UKPN) and its international parent body APECS (Association of Polar Early Career Scientists) formed during IPY 2007-2008. Young UK researchers are playing significant roles in the APECS organisation.

5. There are bilateral polar cooperation agreements between UK and Arctic nations, such as Canada and Norway, and these are supported by the Arctic Office. It has also made formal links with several Russian Academy of Science institutes in Siberia.

6. The Office advises and supports the Foreign and Commonwealth Office (FCO) in their activities as the UK representatives to the Arctic Council and briefs other government departments. The Office represents NERC on the Cross-Whitehall Arctic Network chaired by the FCO. It provided substantial contributions to the development of the recent UK Arctic Policy Framework Report (2013).

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203 Submitted by Dr Cynan Ellis-Evans (Head, Arctic Office) - primarily addressing questions 1 and 5
7. The Office works closely with Arctic Council working groups and particularly AMAP (Arctic monitoring and Assessment Programme) and CAFF (Conservation of Arctic Flora and Fauna). It has embedded UK Arctic researchers in Arctic Council expert groups and assessment projects to address diverse topics which have recently included, Arctic biodiversity, persistent organic pollutants, black carbon, greenhouse gases, ocean acidification, cryosphere interactions with climate and Arctic scientific cooperation.

**Question 1. What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?**

8. Observable changes, many of which have regional and global implications, are underway across the Arctic. Surface albedo feedback through the influence of modified snow and ice conditions on surface shortwave radiation contributes substantially to amplification of high latitude warming seen as a result of rising greenhouse gas concentrations. Drying soils and warming air temperatures are increasing the prevalence of shrubs over tundra, which then also generate a positive feedback for climate warming through changes in albedo. In addition there has been the influx of warmer waters from both the Atlantic and Pacific Oceans.

9. There is a breadth of evidence to indicate the Arctic has been warming since the 1950's and the past decade has seen particularly striking change. During the period 1946 to 1997, a cyclonic regime resulted in low sea level atmospheric pressure, driving the sea-ice and the upper ocean clockwise, and enhanced freshwater fluxes from the Arctic to subarctic seas. However since 1997, anticyclonic circulation has prevailed and the high pressure has driven both sea-ice and the upper ocean counter-clockwise and reduced freshwater fluxes from the Arctic.

10. Arctic change is most obviously demonstrated by the dramatic decrease seen in Arctic sea-ice extent, sea-ice volume and the proportion of multi-year ice over the past decade or more. Data from UK and US submarines and more recently from satellites such as ICESAT and the ESA satellite CRYOSAT 2 have demonstrated a remarkable decrease in sea-ice thickness and loss of the multi-year ice that previously extended over vast areas of the Arctic Ocean. Instead, first year ice, which is more susceptible to break-up has come to dominate the seasonal sea-ice cycle and large areas of open water, particularly in Siberian shelf seas, now occur each summer.

11. The loss of summer sea-ice is affording opportunities for longer fishing seasons and the opening of trans-Arctic sea-routes for commercial traffic, including tourist vessels. Reduced sea-ice will allow greater access for oil and gas exploration and future exploitation as well as facilitating access to ship transportation of ore from Arctic mining. UK has interests in all these areas as well as the supporting activities of insurance, risk management, shipping support and search and rescue.

12. Consequences, of reduced sea-ice include the threat of marine accidents, oil spills (particularly under winter ice conditions), disruption of existing subsistence fishing/hunting, increased commercial fishing impacts on local people, sound and chemical pollution of
migration routes for marine mammals, introduction of alien species and the threat of coastal erosion from storm action on coastal settlements.

13. There is evidence that Arctic amplification during recent decades has been influencing mid-latitude weather patterns, by reducing upper level westerly winds. This may manifest an increased tendency for the jet stream to follow a more wavy path west to east. This promotes more persistent weather patterns that are associated with extreme weather events that can impact significantly on UK. UK business is increasingly looking to more effective modelling performance to improve our understanding of the chaotic behaviour of the Earth’s atmosphere in a changing climate and our understanding of Arctic climate is still incomplete.

14. Freshwater influx from the major Arctic rivers (as well as contributions from melting of sea-ice) has increased markedly over the past two decades. The presence of overlying freshwater influences ocean-atmosphere exchange and vertical patterns of thermohaline circulation. As mentioned above, current anticyclonic wind patterns, in concert with ocean currents, have resulted in an enormous volume of fresh water accumulating in the Beaufort Sea. Should these environmental restraints weaken or disappear the substantial freshwater reservoir would then move south to potentially interact with the warm North Atlantic currents heading north and could have consequences for mid latitude climate, impacting UK and Europe.

15. The permafrost soils of the Arctic are showing evidence of warming to depth and an increased depth of the surface active layer that thaws each summer. The period in which ice roads essential for Arctic transport through the winter months are useable has reduced by almost two months in recent decades and there are also significant threats to the future integrity of existing infrastructure, including buildings, roads and pipelines as permafrost thaws.

16. Arctic circumpolar soils contain the largest component of the Earth’s stored organic carbon though there is still only limited data on the nature of the organic carbon and how it would be metabolised as global warming influences the terrestrial landscape. Marked changes in permafrost and hydrological conditions through warming have been observed in areas such as Siberia and the Canadian Arctic. Although greening of the Arctic will initially increase carbon storage in vegetation, future Arctic carbon emissions to the atmosphere will outpace carbon storage, and changes in landscape will result in more of the sun’s energy being absorbed, accelerating climate change.

17. As permafrost thaws and slumps there is proliferation of shallow thermokarst ponds and wetlands that can facilitate greater methane production and emission. Substantial emissions of greenhouse gases, and particularly methane, could very significantly exacerbate global warming. However there is still inadequate knowledge of process rates in the various terrestrial environments, including the oxidation of methane. Current observations indicate only a slow increase in atmospheric methane concentrations alongside the well-documented increases in the far more abundant carbon dioxide but much more detailed observations and modelling are still required.
18. The very shallow Siberian shelf seas, in particular, overlie what were originally terrestrial landscapes and relict terrestrial permafrost still remains in places trapping substantial quantities of methane. There have been observations of methane ebullition in the water column that has led to speculation of possible catastrophic abrupt release of methane that could markedly accelerate global warming, but there is no clear evidence of significant methane emissions reaching the atmosphere. The vast majority of methane appears to be oxidised within the water column.

19. At greater depth on the continental slope pressure and temperature conditions suitable for the creation and maintenance of methane hydrates (clathrates) also occur around the Arctic. These hydrates represent a vast hydrocarbon reservoir that could potentially be extracted and exploited in the future. Ocean warming could ultimately lead to marine sediment warming and the release of methane from hydrate but this is generally not thought to be a significant threat in the short term. The evidence suggests that terrestrial wetlands are the primary source of atmospheric methane in the Arctic and that marine methane sources make very little contribution.

20. Reduced sea-ice extent could be devastating for ice dependent predators such as polar bears and seals, which then impact subsistence hunters who depend on these animals. Increases in invasive plants, animals, and fish in the Arctic have been documented and these create new threats to endemic species and natural ecosystem interactions. Warming of northern forests is leading to greater threats of insect damage and there has been a significant increase in extensive wildfires.

21. The effects of ocean acidification, which are developing rapidly in polar oceans, are still poorly understood, yet could cause immense disruption to Arctic marine biodiversity, ecosystem processes and the related ecosystem services. We still have relatively incomplete knowledge of Arctic marine ecosystems and so are poorly placed to assess the impact of environmental change on these systems and to build this information into models that could help understand the impact of change on indigenous species. Norway and Russia collaborate to operate a form of ecosystem based fisheries management in the Barents Sea. Other areas operate more conventional fisheries management but there are also parts of the Arctic where subsistence fishing is the norm.

22. Arctic residents are economically, ethnically, and culturally diverse, and the impacts of environmental change vary with local circumstances. In communities located along receding shorelines, increased coastal erosion is commonplace because of more frequent storms and decreased protection by sea-ice, with subsequent ecological and economic costs. We are still in need of better information of the scale and nature of coastal erosion and its impacts on both coastal seas and communities.

Question 5. Are there sufficient data on the Arctic to make informed policy decisions? If not, where are the gaps and how should they be remedied?

23. Despite the long history of Arctic studies, the region has only a limited record of observations— low density, and with limited duration and coordination. Long-term records are in many instances incomplete, and there are measurement gaps in all domains. It is also
difficult to compare Arctic data across disciplines. Many voids exist because measurement
programmes are inadequate or because of technological limitations created by the harsh
conditions (extreme cold and winter darkness) and remoteness.

24. In addition, some areas have lost measurement capabilities as infrastructure such as
river gauges and observatories have been decommissioned due to lack of resources. This is
particularly evident in the post-Soviet Russian Arctic but has been also evident in North
America. There have been some improvements over the past decade, notably post IPY
(International Polar Year 2007-2008), but the vast Siberian region is still very poorly covered
by observational facilities and represents a major hole in pan-Arctic observations. Similarly,
there are large areas of the Canadian Arctic that remain poorly observed, though the post-
IPY refurbishment of its network of Arctic field stations and the opening of a new High Arctic
Station (CHARS) in 2017 suggests that Canadian Arctic observational studies will improve.

25. There is still a paucity of coastal marine laboratories and for the moment only the marine
facility on Svalbard (part funded by the Scottish Association of Marine Science, SAMS) has
running seawater at in situ temperatures to facilitate marine biology experiments. It is
intended that the upcoming Canadian High Arctic Research Station (which opens in 2017)
will hopefully include such capability. There are also very few year-round operated land-
based stations and sustained measurements of key atmospheric variables such as methane,
ozone and various contaminants are again limited to a very few stations that are not entirely
representative of all Arctic environments.

26. Much of the Arctic Ocean remains poorly known as the need for expensive heavy ice
breakers to gain access has resulted in very limited datasets. The WMO (World
Meteorological Organisation) has a programme of ARGO oceanographic floats that are found
throughout the world’s oceans but the floats are present only in the Nordic sub-Arctic Seas
(many installed recently by the NERC Arctic Research Programme) because of difficulties in
operating in seasonally ice-covered waters.

27. The major global marine programmes do not have ship stations for measurements in the
Arctic Ocean beyond Fram Strait or north of Nunivat Island in the Bering Sea due to ice
conditions. The development and deployment of new technologies such as ice tethered
ocean profilers as well as autonomous underwater vehicles and unmanned aircraft will
change this picture in due course but for now it is an extremely data-poor environment.

28. There has been an increase in satellite coverage of the Arctic (particularly since IPY) and
new more dedicated and relevant satellite resources (such as the ESA Cryosat 2 and Sentinel
series) are now aloft (or upcoming) to better study the cryosphere. However the still limited
surface-based observations erode the capability to validate satellite imagery, thus
undermining the usefulness of that data source. Again this is now improving.

29. Many of the observational data that do exist come from specific research projects that
collected data in limited areas for short periods of time. As such, continuity in time and
space is rarely the result of a larger plan. Most existing science planning efforts address
specific questions, processes, time scales, or regions, and they gather just the data needed
for the specific project.
30. Observations and models show the Arctic to be one of Earth’s most sensitive regions to climate change. Nonetheless, most general ocean and atmospheric circulation models are not as effective as they could be in representing northern regions. The models do not have sufficient observational data to adequately reproduce the state of the Arctic Ocean, sea-ice, and atmosphere, which have to be considered together. In addition, the models still do not adequately incorporate critical system-level feedbacks or reflect the chaotic physics of Arctic climate particularly well.

30. These deficiencies highlight the need for more observational data for model calibration and validation, though the data targets needs to be carefully selected, and for model improvement through inclusion of new processes, feedback mechanisms, and assimilation of observational data through reanalysis. Models could be improved by incorporating underused sources of observations, such as the local and traditional knowledge of Arctic residents as well as through mining stored data that has not as yet been made more readily known to the wider community.

31. Some excellent observational data are now being collected from various platforms across the Arctic and further capability is planned. The initially EU funded SIOS (Svalbard Integrated Observing System) project (http://www.sios-svalbard.org) in particular aims to utilise the most extensive research infrastructure in the Polar Regions and to bring together previously somewhat fractured and poorly coordinated observing activities of over a dozen European and Asian nations within a common research framework. Other initiatives include the US-led Distributed Biological Observatories in the western Arctic Ocean and the international pan-Arctic Observing System (AOS) and Sustained Arctic Observing Network (SAON, www.arcticobserving.org) which seek to bring various national and international activities together to facilitate coordinated pan-Arctic data collection.

32. To advance the observing network toward the desirable state of seamless data integration, it is critical that current observational systems be continued, critical gaps are filled, and observations from established and maintained instrumented platforms such as satellites, ocean buoys and moorings, weather stations, and other observational methodologies become integrated across disciplines, nations, and cultures, including linkages to local and traditional knowledge. There also is an urgent need for technological development to enhance and extend current observational capabilities in these challenging environments.

33. UK is contributing to some substantial programmes of research in the Arctic, notably the current NERC Arctic Research Programme (2011-2016), the recent NERC Ocean Acidification Programme (www.oceanacidification.org.uk) and the diverse research of UK researchers in both Polar Regions on upper atmosphere processes, with particular reference recently to space weather. UK has had only limited involvement in longer term (decadal scale) observational programmes but could profitably join emerging Arctic observing initiatives such as the emerging SIOS programme which will transition into an operational phase in coming years.
34. UK researchers are highly respected in Polar Regions but there has been relatively limited coordination and prioritisation of their essentially bottom-up driven work in the past as there has been no over-arching and on-going Arctic science strategy. The recent NERC initiative to establish a Polar Partnership of representatives from HEI’s and institutes with polar interests offers the opportunity to develop a more effective strategic framework for UK polar science. The Arctic Office will be working with the Polar Partnership in providing the Arctic component of the secretariat support necessary to operate the committee.

35. Significant UK resources in the Arctic are currently limited to the NERC Arctic Station on Svalbard (http://www.arctic.ac.uk/infrastructure/research-station/) and the presence, in summer, of the RRS James Clark Ross and, on occasion, elements of the BAS operated fleet of polar research aircraft. Effective funding of these and support for other UK related infrastructure such as ocean moorings and upper atmosphere instruments (which again are present on and around Svalbard) are necessary to maintain a status quo. A strategic plan for growing a more coordinated on-going Arctic science presence will be essential in order to begin contributing effectively to very necessary sustained Arctic observational studies that the post-IPY international community are now developing.

September 2014
Transcript to be found under HE Else Berit Eikeland
Dr. Richard Powell, Professor Michael Bradshaw, and Professor Frances Wall – Oral evidence (QQ 142 – 157)

Dr. Richard Powell, Professor Michael Bradshaw, and Professor Frances Wall – Oral evidence (QQ 142 – 157)

Transcript to be found under Professor Michael Bradshaw
Arctic Council

1. When requesting new responsibilities and regulatory functions from the Arctic Council, the history of the organisation must be remembered. There are good scholarly histories on the Arctic Council, such as by Carina Keskitalo and Timo Koivurova among others, which provide extensive detail.

2. In brief, the Arctic Council emerged from specific negotiations as a ‘soft power’ or ‘soft law’ organisation during the early 1990s. It has made great advances in inter-state cooperation over Arctic environmental issues and in the involvement of indigenous peoples (through the ‘Permanent Participants’ designation) since its foundation in the Ottawa Declaration of 1996.

3. Recent years have seen the terms of debate about Arctic governance and regulation shift significantly. Since 2007-08, as global interest in the Arctic has grown, some actors have called upon the Arctic Council to take on new responsibilities. The Arctic Council has proved remarkably resilient to these greater expectations and has evolved significantly. However, in order for the Arctic Council to take on enhanced regulatory roles, as some have called for, this remains unrealistic unless further significant reform occurs in the organisation. Further, this would have to be supported by member states, permanent participants, state observers (including the United Kingdom), ad hoc observers and other interested stakeholders. My impression is that such proposals are unlikely to meet with unanimous support across the different groups.

4. The UK continues to contribute to the six Working Groups of the Arctic Council through significant input of scientific expertise. Despite research input into the reports of the Working Groups, it is difficult for UK natural and social scientists to get funding to attend meetings of the Arctic Council (whether through Research Councils UK or other available means). If UK scientists and social scientists are present at meetings of the Arctic Council, it is often through their being representatives of international associations that have delegations at the meeting (e.g. scholarly associations).

Arctic Social Science in the UK

5. As noted during the Evidence Session, there are significant strengths in ‘Siberian Studies’ at the University of Aberdeen and the Scott Polar Research Institute, Cambridge. There is also important expertise in Arctic Canada and parts of Scandinavia at these institutions.

6. However, as well as this, it must also be noted that the community of social scientists and humanities scholars working on the Arctic in the UK is significant and diverse. There are significant concentrations of staff and students at the University of Oxford (resources, geopolitics, indigenous peoples, history, archaeology), Royal Holloway,
London (geopolitics and media) and Durham University (law, cartography), as well as strengths at institutions such as the University of Dundee (law) and the Scottish Association of Marine Sciences, Oban (environmental management). These strengths were consolidated through the support of a Seminar Series funded by the ESRC, 2010-2011, as well as through other funding bodies.

7. Inevitably, it is the nature of such research that many of these UK groups often work in collaboration with researchers in other Arctic countries, especially in Denmark, Greenland, Sweden, Norway, Finland, Canada and Russia.

8. A key, distinctive strength of the UK contribution to Arctic social sciences is the academic, objective assessments of resource developments and their socioeconomic, political and environmental impacts based on long-standing knowledge and expertise. This provides an important supplement to consultancy reports produced both by industry and environmental NGOs. It is critical to provide opportunities for this research to continue to grow and contribute to UK research and policy interests in the Arctic.

October 2014
Transcript to be found under Dr. Sheldon Bacon
Professor Chris Rapley, Dr. Sheldon Bacon and Dr. Ed Hawkins – Supplementary written evidence (ARC0013)

**Professor Chris Rapley, Dr. Sheldon Bacon and Dr. Ed Hawkins – Supplementary written evidence (ARC0013)**

*Submission to be found under Dr Sheldon Bacon*
Q50 The Chairman: Mr Rigby, can I welcome you to the second session today of the Lords Select Committee on the Arctic? We are very grateful to you for getting up very early where you are and being able to go through a number of questions as part of the evidence for our report on Arctic issues. To go through one or two formalities, you should have been given a list of our own interests that we have in Arctic affairs, so you are aware of those. I suspect that the session will last just under an hour, and we are being broadcast live. It would be useful to us and members of the public listening in and in the room here if you could, for the record, briefly introduce yourself. I am not sure whether you would like to make a short opening statement. That is entirely up to you. We will then move into questions.

Vincent Rigby: Thank you very much. I greatly appreciate the opportunity to appear before you today. It is not too early in Canada. I am a bit of an early riser, so I am okay. I have had
three or four cups of coffee, so I should be ready to go. I would like to introduce to my left, to your right, Ingrid Nielsen, who is senior policy adviser to the Chair of the SAOs, which is my position.

I was told to try to avoid opening statements, so I have not prepared one. My understanding was that this would be primarily in the form of an interview and a response to some of the questions you have laid out beforehand, with perhaps some ancillary questions as well. Perhaps I could start by saying what my role is as chair of the Senior Arctic Officials and how it fits into the hierarchy in the Arctic Council. I can probably do that in one or two minutes, and then I will be very happy to field your questions.

As to how I fit into the hierarchy, at the top of the pyramid, if we can call it that, would be the Chair of the Arctic Council. Right now Canada’s chairmanship is led by The Honourable Leona Aglukkaq. She is Canada’s Minister for the Arctic Council and also happens to be Canada’s Minister of the Environment. She is responsible for the broad direction of Arctic Council activities and establishing the agenda, programme of activity and so on, working very closely with the other Ministers of the Arctic states in the Arctic Council. She will chair a ministerial in the spring of 2015, which is standard procedure. There is a major ministerial conference every two years in the Arctic Council, and that is where a broad ministerial declaration is issued. The SAOs, the Senior Arctic Officials, report to the Ministers, and so that is where she finishes off her role and passes it on to the next chair, which of course will be the United States. She works very closely with her ministerial counterparts, as I say, in establishing that broad direction and working on the agenda.

\[204\] Note by witness: Minister Aglukkaq is Minister of the Environment, Minister of the Canadian Northern Economic Development Agency and Minister for the Arctic Council. Minister Aglukkaq is also Chair of the Arctic Council during Canada’s Arctic Council chairmanship.
A little lower down in the pyramid comes my position, which is Chair of the Senior Arctic Officials. If you have the broad direction set at ministerial level, I am responsible for implementing that broad direction—the programmes, projects and activities of the Council, and overseeing, with the support of the national Senior Arctic Officials and the Permanent Participants—the PPs, the representatives of the indigenous communities—the work of the working groups and the task forces. This is really where the meat and potatoes work of the Arctic Council is done: within the working groups and within the task forces.

I was fortunate enough, just to finish off, chairing my first SAO meeting in Yellowknife last week, where we had reports out from all the working groups and task forces, and I had a chance, with my SAO and PP colleagues, to provide some guidance back to the working groups on how their work is done. Again, that was looking forward to the ministerial in the spring to make sure that we have some good, hard deliverables, but also—I think this will address one of your questions, but I would be happy to come back to it in more detail later—that we have continuity through the various Arctic Council chairmanships. I made very clear at the Yellowknife meeting last week that I have two priorities as we head into the home stretch of Canada’s chairmanship: the hardcore deliverables and outcomes—the bright and shiny things, so to speak, that we want to put in the storefront window to highlight Canada’s chairmanship; and making sure that we have a smooth transition to the US chairmanship in 2015 and continuity in our work. Our work is not just about the current chair or two-year cycles; it is about longevity and the viability of the Arctic Council over the longer term.

Finally, you have the Senior Arctic Officials and the Permanent Participants themselves. The SAOs are the national representatives from the eight Arctic-state countries. The Permanent Participants come from the six indigenous organisations that are represented in the council. I often refer to the Permanent Participants as the real connective tissue to the work of the
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

Arctic Council and the people on the ground in the north. One of the unique features of the Arctic Council is the role of the Permanent Participants. I do not see it in any other international body that I have worked on, certainly. Canada has put a lot of stress and emphasis in its chairmanship on the human dimension of the Arctic, on “development for the people of the north,” and we have relied very much on the Permanent Participants and the indigenous communities to help us define that agenda. They have a very important role to play, along with the Senior Arctic Officials. Again, my role as chair of that body of SAOs and PPs is to listen to their advice and, based on consensus—because it is a consensus body—work together to make sure that we achieve the outcomes for the Arctic Council.

That is effectively it. I have been on the job for a little over three months, so I am still a little wet behind the ears. If I cannot answer all your questions today, I will certainly commit to getting you answers as soon as possible. However, the timing is great, given that I just chaired my first meeting of the SAOs and the PPs last week. I am a little smarter than I was the week before, but not that much. We will see today.

The Chairman: Thank you, Mr Rigby. That was a very good and very comprehensive introduction.

Lord Hannay of Chiswick: Can I just ask how often the senior officials meet?

The Chairman: I will do it on behalf of Lord Hannay; he was asking how often the SAOs meet. I think it is twice a year, is it?

Vincent Rigby: Twice a year, about every six months or so in person. We had the meeting last week in Yellowknife. Before that it was in Whitehorse, I believe in March, but it was before my time. We also have regular telephone calls. For example, there was a teleconference in June under my predecessor, and I held another teleconference in August. There is very regular consultation, and we are going to hold another SAO meeting in March.
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

in Whitehorse just before the ministerial meeting, but I have also made a commitment to my SAO and PP colleagues that I will hold as many teleconferences as necessary. I suspect we will need a few to make sure that we have a good, strong agenda for the ministerial in the spring.

Q51 The Chairman: That is very useful, thank you. If I could move on to the first question, when the Committee visited Tromsø, Norway, recently, we met members of the permanent secretariat, and we asked similar questions. What are current priorities of the Arctic Council? Is the council evolving in the direction of being concerned with sustainable development and policy development as opposed to its origins in environmental protection and science? Do you think the Arctic Council is becoming a decision-making body instead of an advisory and decision-influencing body? That is a good area to start off with.

Vincent Rigby: Absolutely. There are two broad questions there: the current priorities of the Arctic Council under Canadian chairmanship, and the evolution of the Arctic Council—a decision-making body versus a decision-influencing body, perhaps informing decision-making as much as anything else.

On the current priorities, under Canada’s chairmanship, as I said before, there has been a great deal of focus on the human dimension of the Arctic and very much on economic and social living conditions for people who live in the Arctic, both indigenous communities and otherwise.

The actual broad theme for Canada’s chairmanship has been “development for the people of the North,” and this is a very personal commitment on the part of the Chair of the Arctic Council, Minister Aglukkaq. Minister Aglukkaq is an Inuk from the north and she has a very close connection to conditions and circumstances in the Arctic and to the people. Before Canada’s chairmanship was even up and running, she went out and consulted extensively in
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

the north on what Canada’s priorities should be. She listened to what people had to say, and what she heard from people on the ground in the Arctic was that jobs, mental wellness, the importance of traditional knowledge and ways of life, climate change et cetera were all important and affected their lives on a day-to-day basis. That has been very much the focus. There have been three sub-themes: responsible resource development, safe Arctic shipping and sustainable Arctic communities. We have a variety of initiatives and projects under each of those three sub-themes. I can talk about those in a little more detail if you would like, but generally speaking an example of responsible resource development would be the Arctic Economic Council, which I think you may want to talk about in a little more detail later.

The Chairman: We will come on to that next.

Vincent Rigby: Regarding safe Arctic shipping, the Council is looking at ways to promote safe shipping for cruise ships and tourist ships in the Arctic. We are looking at possible guidelines there. On the question of sustainable Arctic communities, again the Council deals with issues like climate change but also black carbon and methane and things like that, as well as mental wellness, traditional ways of life and so on.

On the question of sustainable development versus environmental protection, I do not think there is a trade-off there. I feel very strongly that it is not an either/or. They are complementary and mutually reinforcing; they are not mutually incompatible. I know there has been a bit of a sense in the public that perhaps Canada has moved the chairmanship a little more in the direction of sustainable development and a little less in the direction of environmental protection. I do not see that. Indeed, if you look at the Ottawa Declaration of 1996 it is very clear that those are seen as two strong pillars. There is this notion that we have moved away from environmental protection, because that was the focus early on, and
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

Canada has put more emphasis on sustainable development, but those were always two pillars. It was never an either/or. We were expected to do both.

That remains the case, and under Canada’s chairmanship, as I have already mentioned, one of our task forces has been working on black carbon and methane. We are doing a lot of other work on climate change with respect to establishing an online adaptation information portal to enhance information exchange on climate change issues in the Arctic, for example. We are doing a lot on broader environmental issues with respect to oil pollution prevention and response et cetera. I am sure you have seen a lot of this work. I think that under Canada’s chairmanship there has still been a strong emphasis on pollution prevention, scientific research, climate change etc. while also pushing some of these other areas—perhaps a little more than predecessors. It is a debatable point but, again, going back to what I said about Minister Aglukkaq’s personal commitment in the Arctic, I think it has been a welcome development if we have put a little more emphasis than in the past on things like an Arctic Economic Council and social and economic well-being et cetera.

Your second broad question was about decision-making versus decision-influencing. I would say again we are probably a little of both. It depends on your definition of decision-making. We are not a military alliance, obviously; we are not NATO or even in the vein of a G7. We are countries in the Arctic that want to co-operate on Arctic issues related to sustainable development and to environmental protection. We do a lot of very important scientific research that supports decision-making among Arctic countries, whether it is the Stockholm convention or some of the work that we have done in the area of mercury, which has led to some national initiatives. That has been very helpful. I think we have been very good in standards setting, guidelines, information exchanges and setting an atmosphere of co-operation in the Arctic, and we still are.
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

There may be a bit of a trend regarding decision-making, again depending on how you define decision-making, but I refer to the two legally binding agreements that we have right now on search and rescue and oil spill responsiveness and prevention. That could be seen as a bit of a move in broader legally binding decision-making.

**The Chairman:** I think that ties it up and it is fully answered, but do you see there being more instances like those two agreements that have been made in other areas, or is that it for the moment? A brief response will be fine.

**Vincent Rigby:** For the moment, that is it, but I can also tell you that we are certainly looking at possibilities down the line. Will there be any announcements of new legally binding agreements for the spring? I would say probably not, at this point, but under the American chairmanship I cannot say. However, there may be the beginning of a trend there.

**The Chairman:** That is fine. Thank you.

**Lord Hannay of Chiswick:** Presumably the IMO’s Polar Code comes into the category of not involving a decision taken by the Arctic Council but being extremely relevant to the whole lot of its work, and when that comes into force it will in itself fill another gap in the international legal apparatus.

**Vincent Rigby:** Absolutely. The Arctic Council has been very supportive of the work of the IMO. The secretary-general of the IMO made a presentation to Arctic Council SAOs I believe last year or earlier this year, if I am not mistaken. Their work is very complementary, very connected, and we support their ongoing efforts to establish a Polar Code.

**The Chairman:** Lord Hannay, do you want to continue?

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205 Note by witness: The Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic (2011) and The Agreement on Cooperation on Maritime Oil Pollution Preparedness and Response in the Arctic (2013) are the two legally-binding agreements negotiated under the auspices of the Arctic Council.
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

Q52 Lord Hannay of Chiswick: Yes. I wonder if we could just have a quick word about the Arctic Economic Council, which I think has been recently set up: a Canadian initiative. Briefly, what have its proceedings led to so far, and do you think it will continue to play a prominent role under successive future chairmanships, the United States most immediately but others after, or do you see rather that each chairmanship seems to have an idea of its own that it then pursues, and then the next one has another idea of its own? That could lead to a certain amount of discontinuity. Finally, do you think there is any prospect of a regional seas agreement?

Vincent Rigby: Thank you very much for those three questions on the AEC specifically, chairmanship priorities and then regional seas. On the Arctic Economic Council, these are very early days. It was only formally set up at the beginning of September. I was fortunate enough to attend that inaugural meeting in Iqaluit. This is one of the flagship initiatives, if not the flagship initiative, of Canada, and we are very proud to be pushing this. We think it is a very important initiative, again under this notion of sustainable development and creating business-to-business links, promoting trade and investment in the Arctic region and improving the overall economic health, including jobs, of the Arctic, while still providing for environmental protection. It is important to remember that again it has been up and running for less than two months, so we will see where it goes, but certainly Canada, the Arctic Council states as a whole and the Permanent Participants have very high hopes for it.

It is important to remember that it is business led. It was mentioned in the Kiruna declaration in 2013 that the Arctic Council would set this up, and it has been set up as an independent body led by business: business has decided on its governance and its operating procedures et cetera. However, Arctic Council states feel that there should be a connection back to the Arctic Council itself. The strength of that connection will be seen over time, but
from Canadian point of view it would be rather odd to set up an Arctic Economic Council and then have it completely divorced from the Arctic Council itself and not provide advice on a regular or quasi-regular basis. However, taking off my chair hat and putting on my Canadian official hat, Canada certainly thinks that this is going to be an important initiative and central to improving the economic and social conditions of people in the north.

As to how it is going to play out in further chair priorities, I cannot say with any great definitiveness right now. It would be a good question for you to ask of the United States. The US representative for President Obama on Arctic issues, Admiral Papp, whom I believe if you have not met yet you may be speaking to at some point, spoke in the CSIS conference in Washington back at the beginning of September and said that the US would still be putting a lot of emphasis on the human side of the Arctic. Last week in Yellowknife we got a very good briefing from the US Senior Arctic Official on US priorities, and we certainly saw a role for the Arctic Economic Council there, and certainly from my conversations with my US colleagues I think everybody is agreed that the Arctic Economic Council is here to stay, obviously, and that it will continue to play an important role in future chairmanships. However, I cannot say to you right now to what extent the US will make it its number one priority versus its number seven priority. We will have to see, as those US priorities play out.

On your question about chairmanship, the two-year rotating cycle and longer-term priorities for the Arctic Council, I think this is the dilemma of any international body with a rotating chair. I said to you before that to my mind my biggest priority moving forward is striking that proper balance between chairmanship priorities, which are still the Arctic Council priorities but are shorter term, let us be honest, if you are looking very much for solid, concrete outcomes at a ministerial meeting, versus those longer-term objectives. Again, I do not think those are mutually exclusive. One of great things about having the two-year
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

Chairmanship is that it helps to focus the mind and move initiatives along. It does help to hold Arctic Council states’ and Permanent Participants’ feet to the fire in many ways. If you had a five-year rotating chairmanship, for example, we might actually move at a slower pace. One year would probably not be enough, two years is probably a good balance, but we are all very cognisant in the Council of the importance of the longer-term work. When we have the ministerial in the spring, that is not for us to wash our hands and go, “Well, we have had a great two years; now we start all over and see where we are going to go”. When the American priorities come out in greater detail, I think you will see that they are building on all the work that has been done in the past. There is a constant building on a solid foundation in the Arctic Council.

One of the last things I will say in that regard is just the importance of accountability. I have served in a lot of different bodies over my career. I am actually the Canadian sous-Sherpa for the G7 right now, and I cannot overemphasise the importance of accountability for Canada. One of the things that Canada has done in its chairmanship is set up a tracking tool to map all the Arctic Council’s projects and programmes, of which there are about 80 in the hopper right now. That monitors where they are, what their status is, what their due date is, when the deliverables are going to be, and that again, speaking of holding people’s feet to the fire, holds the working groups and the task forces’ feet to the fire on delivering. We are going to make that a very public dimension of the Arctic Council, so that when Senior Arctic Officials report to Ministers in the spring, the tracking tool will be attached to that report. We think that it is very important publicly, so that everybody can see what our commitments are and how we are delivering on those commitments. If we fail to deliver, I think we will get pressure to step up our game.
The Chairman: Mr Rigby, because of timing, we are going to have to keep the questions and answers a bit shorter, I am afraid, but that is really very useful. Lord Moynihan has a supplementary question.

Lord Moynihan: Mr Rigby, specifically on your comments on the Arctic Economic Council, we have had a copy of the Alaska Dispatch News article sent to us, which states, “it’s an open secret that the State Department is unenthused by the whole thing; another”—person—“offered that ‘at least’ the Americans didn’t block it. Not a ringing endorsement”. Why do you think that is the position?

Vincent Rigby: First of all, I apologise if I am being a little too loquacious. Maybe I had too many coffees this morning. I will do my best to keep my answers a little shorter. Sir, I would be very cautious about passing any comment on US motivations and where the United States is on the Arctic Economic Council. I can tell you from talking to my colleagues that there is support for the Arctic Economic Council. You have to remember that this is a consensus-based body. The reference to the Arctic Economic Council would never have been included in the Kiruna Declaration if the United States had not supported it. The same goes for its implementation and the way it has been set up and the meeting in Iqaluit: if there had been strong opposition from Washington, we would probably have had to do it in a different way. This is a consensus decision, and certainly I can tell you, from talking to my colleagues among the SAOs and others in the State Department, there is support for the Arctic Economic Council. There is still debate about the relationship between the AEC and the Arctic Council itself, but that is among all the SAOs as we move forward. I would prefer not to comment directly on the Alaska Dispatch News article and whether there is a split between Alaska and Washington.

The Chairman: Thank you.
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

Q53 Lord Soley: In part, you have already suggested that the two-year rotating chairmanship is the best model at the moment, but can you tell us a little more about how much broad agreement there is on the role and function of both the council and the council’s secretariat? Is there broad agreement? Is that a fairly easy matter, or is it changing and is there pressure for change?

Vincent Rigby: My answer to that, sir, would be that there is very broad and very strong agreement, in terms of both the Arctic Council and the secretariat. Let me speak to the Arctic Council briefly first, and then I will return to the secretariat, which is of more recent vintage, as you know—it has only been around two years. It is still evolving.

The Arctic Council, from the beginning, has been identified as a body that would promote, again, environmental protection and sustainable development, collaboration, co-operation and integration among the Arctic Council states, so that is what it does and that is its mandate, and it has been doing that very successfully. I do not think anybody would disagree with that. It is basically enshrined in the Ottawa Declaration.

On the secretariat, I know you have had a chance to visit Tromsø and talk to my good colleague Magnus Johannesson. That is a secretariat that provides administrative support to the Arctic Council. It helps in the smooth and efficient running of the council writ large. I have telephone conversations with Magnus every couple of weeks to talk about how his secretariat supports the broader council initiatives, the Canadian chairmanship, the smooth running of meetings, logistics and communications. I am sure you have all had a chance to take a look at the website, which I think is becoming a really excellent website. They do a lot of work in terms of providing documentation. There is a major initiative right now on archiving and making sure we have a good outreach programme that reaches out to
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

universities et cetera, which is growing. So, that is its role: it is primarily administrative support, and I see that continuing into the future.

Lord Soley: Big issues come up largely following the ministerial meetings and so on, and you talk about them carrying over, but I am a little puzzled as to how much pressure goes on the sitting chairman to maintain those issues or develop their own.

Vincent Rigby: I would say it is a consensus-based organisation. I can tell you, having sat through the meeting in Yellowknife and listened very carefully to everybody around the table, there is a great desire among the SAOs and Permanent Participants to have some measure of continuity across all the chairmanships, and I am not saying that Canada expects the United States to pick up every single one of its priorities. There is always going to be slight variance under individual chairmanships. It will come as no surprise to you that the United States will put a great deal of emphasis on climate change, for example. Again, we have done a lot on climate change too, but I think the US is likely to put even more emphasis there. However, that does not mean that is incompatible with the Canadian chairmanship; not at all. It will build on a lot of the work that we have already done.

I think the key to this is not a matter of pressure being put on new chairs to come in and continue the old work; it is a matter of discussion and dialogue. I have already been down to Washington. I went down in September for the CSIS passing the Arctic Council torch conference. I had a chance to speak with Admiral Papp, and other officials in the US State Department about their upcoming priorities. I do not think my American colleagues would be averse to me saying this, but we have set up almost an ad hoc working group to ensure that the transition from the Canadian to US chairmanship is a smooth one. I mentioned to you that the US brought some of their chairmanship priorities to the SAO meeting last week.
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

Those are now going to be the subject of discussion among the broader SAO and Permanent Participant community.

Yes, there is pressure on the US to have its own priorities; there is pressure on the US to continue with some of the older priorities and build on that foundation. It is a very iterative process, and again it is a consensus-based body, so there has to be agreement on how we move forward.

**Lord Soley:** I understand that, but then you are talking constantly about your relationship with the United States—obviously, because they are taking over next. What about the other states? What about Russia, for example?

**The Chairman:** Following on from Lord Soley, has your relationship with your Russian opposite number been more difficult over last few months? I know particularly the Canadian Government have taken quite a strong view in terms of Russia and Ukraine. How has this affected your work with your Russian opposite number?

**Vincent Rigby:** Thank you for the questions. In terms of Russia and chairmanship priorities, again, Russia is around the table with the other Senior Arctic Officials. They will certainly have comments on US and Canadian priorities, and they will provide their input without a doubt. They are fully a part of that process. With respect to Russia more broadly and the impact of the current geo-strategic situation, if I can call it that, on the Arctic Council, I am happy to report that the Arctic Council has been functioning much as it always has over the last six to eight months. The work is ongoing. Yes, there have been a couple of small bumps along the road, but my Russian SAO colleague was in Yellowknife last week. He has been collegial and supportive of Arctic Council initiatives, and he has told me that at this point in time Foreign Minister Lavrov will be in Iqaluit in the spring. The work continues. I am happy to report that—I really am.
The Chairman: Thank you.

Q54 Lord Moynihan: Mr Rigby, you have listed some of the lasting legacies of the Canadian chairmanship of the Arctic Council: the development for the people of the north and the Arctic Economic Council. Perhaps you could concentrate your mind on whether you feel the mechanisms are in place to ensure that the Arctic Council decisions are implemented. Again, the Committee has seen reports both from the US Government Accountability Office and from Sweden. The US Government Accountability Office states that “state officials said that the council needs to more clearly specify and prioritise recommendations, but the council does not have guidelines for doing so”. On the receiving end, the Swedish National Audit Office has stated that “the Government”—have not—“assigned responsibility for ... a process”: that is, to rank and implement decisions. “It is not clear whether the Arctic Council’s recommendations have been implemented in Sweden”. Are you content with the mechanisms that currently exist for Arctic Council decisions to be implemented, and if you are not, what recommendations would you make?

Vincent Rigby: I would say a couple of things. I have been in the chair for only several months, and this is perhaps just anecdotal—it is not a mechanism per se—but I and all my colleagues on the Canadian side carry the Kiruna declaration in our back pocket and consult it, I would say, almost on a daily basis. I made a joke the other day that I would like a wallet-sized version of the Kiruna declaration so that I can whip out of my wallet at any point. I say that simply because we are constantly referring to it to ensure that when we come to Canada’s Ministerial in the spring we can tick off every box—every commitment that was made in the Kiruna declaration. We have followed very closely the wording in the declaration, whether it is seeking an arrangement versus an agreement versus progress, and I certainly have been instilling that in my SAO and Permanent Participant colleagues. The
Kiruna Declaration is the bible for our chairmanship, and we hope that the Iqaluit Declaration will be the bible for the US chairmanship. Again, I know it is not a formal mechanism, but I can tell you that we have been very conscious of accountability under the Canadian chairmanship.

The second thing I would mention—again, I will not go into any detail because I have already mentioned it—is this tracking tool. I believe it is going to be a very important accountability mechanism. In making it public in particular, it is really going to apply much-needed pressure on the Arctic Council to deliver on its commitments and to make sure that we carry through on our priorities. We are certainly looking forward to that, and I think it is going to be an extremely useful document.

In terms of recommendations for further mechanisms and other ways that we could ensure that we are prioritising properly—in that we do not have too many priorities and we are carrying through with the priorities we do have—I do not think you can have too much accountability. I do not think you can have too many checks and balances in that regard. Beyond the tracking tool, which we are very focused on, I do not have any further firm recommendations right now, but I am open to any suggestions to make sure that the Arctic Council carries through on its commitments. If we do not, we are an empty vessel, and we are going to be judged on what we deliver and how we fulfil our commitments, not on pretty wording in ministerial declarations and reports from SAOs to Ministers. We are very cognisant of that. We have to deliver.

**Q55 Lord Addington:** Mr Rigby, does the Arctic Council need further funding and institutional support in order to sustain itself in the light of all the new observers—the working groups, the task forces, and new developments such as the economic council? How has the influx of new observers impinged on the working of the council, and are other
groups that have traditionally been there feeling that they have been marginalised? I am of course thinking about indigenous peoples in the first order here.

Vincent Rigby: Thank you very much for the question, sir. Again, I think there are two parts there: one on the dollars, and one on the role of the Permanent Participants given the influx of observers et cetera. On the dollars, I do not think I have ever been part of an international body or organisation that felt it had enough money. Even in government, we are all aware that we could always do with more resources. I do not think the Arctic Council is any different. The Council is driven by the states themselves and their budgets, along with assistance from observers and some other sources. We are constantly looking at ways to increase our funding in any way we can and deliver the projects that we feel are necessary to deliver on the broader mandate of the Arctic Council, so that is always an issue. I think we have been doing a good job up to this point, but certainly I would be lying to you if I said that resources did not come up on a fairly regular basis.

With respect to Permanent Participants and observers and so on, I said at the beginning that I think the unique feature of the Arctic Council is the role of the Permanent Participants. If I were going to speak about resources, I would focus more on making sure that Permanent Participants have the tools to do the job than anything else. This has been an issue for a long time in the Arctic Council—that Permanent Participants are not governments. While we may bemoan the fact that we do not have as many resources as we would like on the government side, the Permanent Participants are in an even more difficult position. We actually held a workshop on the margins of the Yellowknife meeting last week dealing exclusively with support to Permanent Participants and making sure that they have the resources to carry out their mandate in the Arctic Council to be able to make a substantive and meaningful contribution to the Council’s activities.
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

We are looking at a number of options, including some external funding sources through foundations and so. I know there has been some talk of perhaps observers contributing more to Permanent Participants at some point in the future. That will be an ongoing discussion, I am sure. However, yes, that is an issue. Canada, I think, would like to move the yardsticks, if it could, during its chairmanship to see what it can do to provide a little more support to Permanent Participants in travelling to meetings, research capacity and, again, the ability to make a real, substantive contribution. I told my colleagues when I opened up the workshop last week that we are coming up on the 20th anniversary of the Arctic Council and we are still talking about this. I think it is time to try to break the impasse in some way, so we are definitely looking at that.

The Chairman: Lord Hunt, I think partly the question has been answered, but would you like to expand on it?

Q56 Lord Hunt of Chesterton: Do you feel that the Arctic Council covers all the major issues in its discussions? One of the issues that has not been discussed much in our Committee but I know is important to Canada and Russia particularly is nuclear radiation and waste. In fact, the Canadians supported important programmes of this sort. This slightly brings me on to the role of observers and the UK, because the UK works quite closely with Russia on some aspects of the question of dealing with nuclear waste. Equally, the UK works closely with many of the Arctic states on climate, weather forecasting, shipping and charting. I just wonder whether you would like to comment on those points.

Vincent Rigby: Thank you very much for the question. Certainly in my four months on the job, nuclear radiation and waste has not come up explicitly—perhaps in passing but not explicitly—as a top priority but certainly more broadly under the rubric of environmental protection. I think it is there, and it may be something that we will want to come back to in
Vincent Rigby (Chair of the Senior Arctic Officials, the Arctic Council – Oral evidence (QQ 226 – 236))

the future. We know it is a very important issue. The fact that it is not necessarily a number one priority right now under the Canadian chairmanship does not mean that we are not acutely aware of it, so there is perhaps more to come on that.

On the role of observers, as a segue into the UK’s role and that of other observers, I am going to be honest with you: I called the observers together when I was in Yellowknife last week, and we had a meeting. I am trying to get my head wrapped around the role of the observers, perhaps much like you are. There are 32 of them—quite a number—a slight minority of which are state Governments, including the United Kingdom. I know they play a very important role in the work of the working groups and that they contribute a lot of scientific and policy expertise. They have also provided financial contributions at times. They have clearly been playing their role. Ultimately, their primary role is to observe and understand even more the impact that their policies may have on the Arctic and the impact that policies in the Arctic may have on them. Again, going back to my earlier point, I am trying to get my mind wrapped round it, because I do get a sense from a lot of the observer states that they would like to do more. Not just the states but the IGOs and NGOs would like to have a slightly more prominent place in the Arctic Council. At this point, I cannot say what that would be, and I will need to have further discussions. I promised the heads of delegation that I met in Yellowknife that I would follow up with them. I think they have been playing a very important role up to this point. I have given you examples of the kind of work that they have been doing. However, if they were to do even more, that would have to be the basis of another discussion.

**The Chairman:** Lord Soley, do you want to follow on from that?

**Q57 Lord Soley:** I think that leads in very well to my next question, because we as an observer state are concerned to get the balance right. Obviously, we have an interest and
we would like to help, but we are also conscious of the importance of not treading on the toes of the full members. Any more thinking you do on that would be very helpful.

Do you have any specific things that you think the United Kingdom could do well, either on task forces or working groups or, indeed, anything else? Is there something you could put your finger on and say, “Yes, Britain can really help on this.”? What would it be?

Vincent Rigby: Again, I know that you have done some great work through some of the working groups. I do not have the details at my fingertips. Given the number of observers, I do not have all the ins and outs. However, I would certainly be happy to go away and give that some thought and provide you with an answer. I know that on the scientific side, if I am not mistaken, you have been providing a lot of assistance and advice, so obviously we would like to see that continue. However, in terms of more concrete suggestions or proposals, if you would let me take that one away, I would be happy to get back to you.

Lord Soley: That would be useful. We are, in fact, quite close to the Arctic; the most northern bit of the UK is only 400 or 500 miles away from the Arctic Circle, so it is of interest to us. I am sure the science and research bit is particularly important, and anything related to the climate change area, but I also think that search and rescue, which we have talked about, and co-ordination and structures on that are all areas that near-Arctic states, not just the UK, have an interest in.

Vincent Rigby: Understood completely—I will definitely follow up with you on that.

Lord Soley: Thank you very much.

Q58 The Chairman: Thank you, Mr Rigby. To come back on that, obviously the UK is one of the original observer states. There has been a large intake of Asian states recently. Do you see a natural limit on the number of observer states that can come into the Arctic Council? How many would make it, if you like, inoperable? Where there is real genuine interest from
a nation state elsewhere in the globe, should they have the principle of access even if takes a while to agree that? How do you see that equation working?

**Vincent Rigby:** Perhaps I can answer that question in two parts. First, I would say that 32 observers is a big number, and it has come up in back-room discussions and what have you in relation to the number of observers and the point at which we say “enough is enough”, to put it crudely.

The second part of my answer is that ultimately that is going to be a decision for Ministers. It is probably not my place to be saying I think it should be this number or that number. Senior Arctic Officials make recommendations up to Ministers, who then make a decision at the ministerial on new applicants. Under Canada’s chairmanship, there may well be further applicants, and Ministers will make those decisions on whether or not they want to accept them.

**The Chairman:** Just on the UK’s role, do you have any feeling for how involved the UK is on the working groups and how many meetings it turns up to? You mentioned, I think, 80 projects that you have at moment, and I just wondered how many of those the UK was involved in. What is the feeling on that—or the facts, if you have them?

**Vincent Rigby:** I am smiling, because just before I came into the meeting I thought, “I really should have asked my staff about the number of projects that the UK has been involved in and financial contributions, et cetera”. I do not have those numbers at my fingertips, but I can certainly get them to you. However, I have been informed by my staff that you have made a significant contribution, and an important one, but I am happy to provide you with hard numbers.

**The Chairman:** That sounds like a very diplomatic answer. That is excellent, Mr Rigby. I am going to ask Lord Addington to move on. Thank you.
Q59 Lord Addington: Mr Rigby, what merit might there be in the suggestion of a summit of Arctic Heads of Government in, say, 2016 or 2017, just to give it impetus and push? I am just throwing that one out there; let us see how you knock this one back.

Vincent Rigby: Do you want me to be diplomatic or undiplomatic? Well, you know as well as I do this has actually been mentioned already as a possibility. The US has thrown it out there. I think Admiral Papp might have mentioned it in passing in his speech in Washington back in September. I believe that the Finns have also perhaps floated it as a possibility under their chairmanship. As I mentioned earlier, the 20th anniversary of the Arctic Council is coming in 2016, so there may very well be some value in having a broader summit that would catalyse Arctic Council activities and initiatives and so on. It is definitely worth considering, but one of the things we will have to keep in mind also is the geo-strategic situation at the time, and I do not know where we are going to be in 2015, 2016 or 2017 in terms of those broader issues. You asked me question about Russia before, and obviously if we were to have some kind of a global summit like that, we would have to factor that geo-strategic situation into the decision-making process. However, it is definitely an idea worth considering.

Q60 The Chairman: Mr Rigby, lastly, as you know the European Union has been trying to achieve observer status for some time. When I was at the parliamentary meeting of the Arctic Council as an observer in Whitehorse in September, the problems with the seal ban and all that came up. How do you see the EU side progressing? Is that going to be something that can be resolved, or are some of those issues going to stay in the way permanently?

Vincent Rigby: Well, this has been a thorny issue, you are absolutely right. We have the wording in the Kiruna declaration that the EU application for observership had been received
“affirmatively”, but that implementation would remain pending until certain issues had been resolved, as set out in President Barroso’s letter in May 2013. Canada and the EU have made a great deal of progress in resolving that issue on seals. There is the separate issue of fully accredited observership for the EU in the Arctic Council. As you know, although it is not fully accredited right now, the EU has been participating in all the work of the Arctic Council, and one of my EU colleagues was at the meeting in Yellowknife. However, a decision on observership will take place at the ministerial. That is the usual time when these decisions are taken, so I would just leave it at that at this point in time.

The Chairman: Mr Rigby, thank you very much indeed again for joining us at what sounds like, from what you said, your usual time in the morning; it would be a bit early for us. Thank you very much for joining us. We very much appreciate your answers. If there is any further information you wanted to provide us with on some of the things we have gone through, we would be very grateful for that. Thank you very much, again, for your participation in this process. We very much appreciate the opportunity to go through these issues with you. Thank you very much indeed.

Vincent Rigby: Thank you, Mr Chairman, for this opportunity. It has been a pleasure for me to speak with you. I guess I would just say “ditto” in terms of anything else I can provide to you. Please do not hesitate to give me a shout. I think I do have a couple of things to follow up on, especially with respect to the UK projects and some ideas as to how the UK could play a greater role as an observer. I will follow up with you on that, for sure.

The Chairman: Good.

Vincent Rigby: Many thanks.

The Chairman: Thank you very much indeed.

Vincent Rigby: Thank you.
The Chairman: I bring this public session to an end at this point, and for those of the public who have been listening or are here, I thank you for your presence.
Royal Society – Written evidence (ARC0047)

1. The Royal Society welcomes the opportunity to respond to the House of Lords Committee on the Arctic inquiry.

2. The Royal Society is the National Academy of Science in the UK. It is a self-governing Fellowship of many of the world’s most distinguished scientists. The Royal Society draws on the expertise of the Fellowship to provide independent and authoritative scientific advice.

3. The Arctic features in many areas of the Royal Society’s work. Much of the Society’s work has focused on the science behind observed changes in the Arctic, understanding why they are happening and how the Arctic may change in the future. For example, a recent discussion meeting was held on 22 and 23 September 2014 on *Arctic sea ice reduction: the evidence, models, and global impacts*[^206]. Recorded audio of the presentations is available on the Royal Society website and the papers will be published in a future issue of Philosophical Transactions A.

4. In response to the Committee’s questions, this submission sets out a few observations that draw upon the Society’s work, in particular, the Society’s 2010 publication *New frontiers in science diplomacy*[^207] and a forthcoming report on *Human resilience to extreme weather*[^208]. The latter report is due to be published in December 2014.

**The Role of Science**

5. The Arctic Ocean is currently crossing an environmental threshold, from a perpetually ice-covered region to a seasonally ice-free one. This is altering the geo-strategic dynamics of the Arctic, and awakening national interests in energy, fishing, shipping and tourism by Arctic States, China and the European Union.

6. There are many direct scientific issues arising from change in the Arctic. For example, changes in sea ice affect ocean ecosystems and atmospheric chemistry; rapid warming will affect terrestrial ecosystems and permafrost stability.

7. Arctic change may affect lower latitudes. For example, some studies have suggested that the reduction in sea ice may change the dominant pattern of atmospheric circulation that controls weather patterns in North America and western Europe: this is a matter of continued research and there is no agreement yet on the nature of the changes that would be induced for the UK.

8. Science has a role in both informing policy and governance of the Arctic and in improving international relations between countries.

9. Science and technology is central to observing and understanding current and future changes in the Arctic, as well as how changes in the Arctic will affect the rest of the

[^206]: https://royalsociety.org/events/2014/arctic-sea-ice/
climate system. However, science also has a key role to play in identifying the extent of the economic opportunities in the Arctic. For example, a collaborative project led by the Geological Survey of Canada and involving researchers from Denmark, Norway, Sweden, Russia and the United States published the first comprehensive atlas of Arctic geology in 2008\(^{209}\). Science is also essential for identifying and mitigating the potential risks associated with changes in the Arctic and with developing economic opportunities.

10. Ongoing research into Arctic Ocean systems will be essential to inform management strategies for when the ice thaws and makes this international space more accessible. More research is required into sea-level rises; loss of sea ice; melting permafrost and feedback mechanisms; the location and availability of resources; and the impacts of long-range pollutants. Much of this research will require international collaboration, especially when the harsh conditions of the Arctic necessitate the sharing of costs, logistics, facilities and other capabilities.

11. The UK has a considerable body of researchers active in Arctic science. The Natural Environment Research Council (NERC) maintains an Arctic office, and is currently funding a £15 million Arctic Research Programme (2010-2015) that supports a range of projects. Many of these projects involve logistic or science collaborations with Arctic Rim nations. The UK, through NERC, is a member of the 22-nation International Arctic Science Committee.

**Identifying Impacts from Arctic Change**

12. The rapid changes taking place in the Arctic will have profound effects globally\(^{210}\). Identifying the emerging risks and opportunities will require a systems approach; the whole system will need to taken into account. Impacts will need to be considered across both temporal and spatial scales. Sectoral approaches alone are not capable of accounting for the multiple risks and possible opportunities.

13. Collaborative, multidisciplinary studies will be required, as will continued monitoring of the changes in the Arctic and the impact of specific interventions.

**Governance of the Arctic**

14. Within the Arctic, there is no single regulatory regime covering the entire region. Instead, the surrounding land masses of the five coastal states of Canada, Greenland (Denmark), Norway (including Svalbard), Russia and the United States are sovereign territories. The Arctic Ocean is governed by national and international legal regimes, most notably the United Nations Convention on the Law of the Sea (UNCLOS). Common interests in the region are coordinated by the Arctic Council, but its membership is limited to the Arctic States.

\(^{209}\)http://geoscan.nrcan.gc.ca/starweb/geoscan/servlet.starweb?path=geoscan/fulle.web&search1=R=225705

15. The centre of the Arctic Ocean, which is now covered by frozen ice, represents a potential starting point for governance discussions which do not threaten the national jurisdictions of the Arctic coastal states, or require an entirely new legal regime. Whilst much of the sea floor may come under national jurisdictions, the overlying water column and sea surface at the centre of the Arctic Ocean is legally distinct, and the UNCLOS already recognises it as undisputed international space.

16. The governance of Antarctica, another international space, sets a precedent for how the soft power of science can help to strike a balance between national and common interests, and could offer lessons for the peaceful governance of other international spaces and transnational resources\textsuperscript{211}. Beginning with research collaboration to arrive at common understandings of the science and uncertainties can be diplomatically helpful. The diplomatic potential of research collaboration in international spaces, where political sensitivities are high, should be strengthened.

17. Environmental security discussions focused on international space could provide a cooperative framework through which to address military risks. For example, energy development, fishing, shipping and tourism in the Arctic all require coordinated search and rescue missions for stranded vessels. The thawing of the Arctic Ocean also increases the risk of accidents and the need for emergency responses to ecological disasters. Given that militaries are trained in providing disaster relief and search and rescue, clarifying their role in this context could increase transparency and maintain a dialogue that could eventually allow more sensitive issues to be addressed.

**Adaptation Strategies in the Arctic**

18. The Royal Society’s forthcoming report on human resilience to extreme weather addresses the fundamental elements of building resilience and evaluates specific adaptation and disaster risk reduction options. However, due to the project’s global scope, we have not gathered evidence to allow us to comment on detailed aspects of adaptation in the Arctic. It also does not address new economic risks and opportunities. A few general lessons can be applied:

a. Since adaptation is context-specific, local or regional innovations and solutions must be facilitated and community participation encouraged to bring together the users and producers of knowledge. The Arctic is experiencing rapid environmental and social change; dealing with these changes will involve difficult choices, with a variety of different perspectives. It is essential that the variety of voices is heard in the development of strategies for the Arctic.

b. Adaptive management, a process of iteratively planning, implementing, and modifying strategies for managing resources in the face of uncertainty and change, is a key resilience technique and one that could be usefully applied in the Arctic. By incorporating adaptability into the process uncertainty can be managed.

c. Evidence is vital in developing effective policies for adapting to climate change. Careful scientific study, modelling, and monitoring can improve understanding of

\textsuperscript{211} Royal Society (2010) New frontiers in science diplomacy: Navigating the changing balance of power, Royal Society Policy document
hazards and exposure, and can often provide valuable early warning. Improved monitoring and evaluation of adaptation interventions are necessary to allow options to be assessed consistently to support better decision-making.

d. Shared action and responsibility is required at multiple levels of society, from the individual or household to the international community. Adapting to change will require the involvement of a range of government agencies, the private sector and civil society. For this network to be effectively managed there needs to be a clear lead agency and core responsibilities need to be unambiguous.

e. Ecosystems can play an important role in hazard reduction. Ecosystem-based and hybrid approaches to hazard risk reduction should be considered, in addition to more conventional engineering approaches, as they have lower risk of catastrophic failure and provide additional benefits to societies.

September 2014
The Royal Society, the Henry Jackson Society, and Arctic Advisory Group – Oral evidence (QQ 158 – 172)

Transcript to be found under Arctic Advisory Group
TUESDAY 16 SEPTEMBER 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Viscount Hanworth
Lord Oxburgh
Lord Soley

Examination of Witnesses

Mr Runar Myrnes Balto, Political Adviser to Ms Aili Keskitalo, President of the Sami Parliament, and Mr Jon Petter Gintal, Senior Adviser, Department of Rights and International Affairs, the Sami Parliament

Q61 The Chairman: Good morning. Could you please introduce yourselves?

Mr Runar Myrnes Balto: My name is Runar Myrnes Balto. I am the political adviser to the president of the Sami Parliament, Ms Aili Keskitalo. I have with me Jon Petter Gintal, who is with the administration of the Sami Parliament. He helps me on a lot of the legal issues. They will be touched on in the presentation.

The Chairman: He also helped us very much by getting us here.

Mr Runar Myrnes Balto: So I can begin. First, welcome to our relatively humble office in Tromsø. Of course the real Sami Parliament is in Karasjok, with our Parliament building. We have just about established a bigger office in Tromsø with about 12 employees here as well.

I would like to just give you an overview of the Sami people and how we are organised. The Sami people are one of several indigenous people in the Arctic. There are differences between us when it comes to language, social organisation and the extent of influence that
we have on our futures, to name a few. There are a couple of indigenous peoples that we say are related to us in terms of culture and tradition: especially, the Inuit in the west and also the Nunaat to the east. However, the indigenous people in the Arctic have at least one basic thing in common: our lives and cultures are closely tied to the gathering and removal of resources. I mean things like fishing, hunting, trapping and reindeer herding. Our identities, individually and collectively, are closely connected to how we make use of and connect ourselves to the resources and landscape.

Resource areas, diversity of nature, cultural monuments and the landscape comprise an important part of the material basis for the Sami culture. The Sami settlement area is called Sápmi and covers four national states: Norway, Sweden, Finland and the northern parts of Russia—the Kola Peninsula. As you can see from the map, the Sami stretch from the Kola Peninsula in the north-east to Engerdal in southern Norway and Idre in southern Sweden. We comprise a minority in all four of the national states but in certain areas in central Sápmi—which you can see in the far north of the map—we have majority communities. There, the Sami people are in the majority.

The status of the Sami as an indigenous people is derived from the fact that the Sami inhabited the Nordic area before the present-day state boundaries were drawn. Also, when we talk about the identification of who is a Sami, one of the most important aspects is that you need to have self-identification as a Sami as well as a connection to the language—for example, “I speak the language and my grandfather speaks the language”—to be able to call yourself a Sami. Even though we live in four countries, we still have common languages, common culture and traditions as well as crucial national symbols. The Sami flag, Sami national day and Sami national anthem are all recognised and honoured by Samis in all four states. If you have any questions during this, please ask.
The Sámi Parliament of Norway – Oral evidence (QQ 116 – 130)

**Lord Oxburgh:** What is the total number of Samis?

**Mr Runar Myrnes Balto:** It is difficult to put a number on it but we have an estimate of between 80,000 and 100,000. It is not an understatement to say that we are few by numbers. There is a saying that even though we are pretty few, the Sami area is definitely not underpopulated by the fact that we make use of all the land. There are a lot of reindeer, for instance, that inhabit the Sami area.

There are several areas in Sápmi where few of the Sami speak the languages due to forced cultural assimilation over the past couple of hundred years, but they still consider themselves Sami. Also, there is no exact number of how many people speak Sami but we have an estimate of around 23,000 within Norway and also more outside Norway in the three other countries.

**Q62 Lord Addington:** I have a question that might be helpful. How many people are educated in the Sami languages?

**Mr Runar Myrnes Balto:** How many are educated?

**Lord Addington:** Yes, using it as part of their language?

**Mr Runar Myrnes Balto:** We do not have a number. If I remember correctly, there are approximately between 1,000 and 2,000 people in the school system learning the language.

**Lord Addington:** Do people from the other nations ever learn Sami as a second language?

**Mr Runar Myrnes Balto:** Are you thinking about the majority population of Norway, for instance? Not many. In many schools they have the option but it is not mandatory. But every Sami has the right to learn their language at school.

This is a picture of the Sami Parliament in session. It is not in session now but these are the politicians represented in this term. The Sami Parliament in Norway is elected by and among the Sami. The representatives hold seats for a four-year period, so we are now in the second
The Sámi Parliament of Norway – Oral evidence (QQ 116 – 130)

year of this period. The Sami Parliament has 39 representatives from seven electoral districts. It is in session for four or five weeks a year. Between the sessions, political work is conducted by a five-person council led by the Parliament president, which right now is Ms Aili Keskitalo.

Lord Oxburgh: That is just for Norway?

Mr Runar Myrnes Balto: Yes. I will touch upon this but there are also Parliaments in Sweden and Finland.

The background to the establishment of the Sami Parliament in Norway was that the Sami Rights Committee submitted its first part-recommendation in 1984, which formed the basis for a resolution in 1987 on the Sami Act. In 1988, the Norwegian Parliament passed a new Article 108 to the constitution. It said: “It is the responsibility of the authorities of the State to create conditions enabling the Sami people to preserve and develop its language, culture and way of life”. The Sami Parliament in Norway was officially opened on 9 October 1989 by his Majesty King Olav V. We are very soon approaching the 25th anniversary of the Parliament. We see the Parliament as a political tool for strengthening the Sami people’s political position and to promote Sami interests in Norway. Also, I would like to state the importance of ILO Convention No. 169 on indigenous and tribal peoples, ratified by Norway in 1990.

We have a Parliament in Norway that was opened in 1989 but the Samis in Finland were a bit ahead of their time with a predecessor to what is now called the Sami Parliament in Finland. That was opened in 1973 in Inari. There is also a Parliament in Sweden which was established in 1993. The Kola Sami Assembly was established in Murmansk in Russia in December 2010. Yet the Russian Government have not accepted the Kola Sami Assembly and, surely, the situation for indigenous peoples inside the Russian Federation is one of
great concern to us in the Sami Parliament. Their main organisation, RAIPON, has been taken over by the Russian Government. We keep hoping for an improved situation for the Kola Sami and other indigenous peoples in Russia in terms of democracy and human rights.

Q63 Lord Oxburgh: Is the Sami language spoken the same way in the four countries?

Mr Runar Myrnes Balto: Actually we have nine different languages, but they do not follow the national borders. They follow geography.

Lord Oxburgh: Can everyone understand each other or are the languages so different that you cannot?

Mr Runar Myrnes Balto: They are basically so different that you cannot always understand each other. You can understand the neighbouring language.

Mr Jon Petter Gintal: If you send a message from the south through all the language groups, then it would be understood all the way but if you send it directly from the south to the north they will not understand it.

Viscount Hanworth: Is there a process of rapprochement going on with the language?

Mr Runar Myrnes Balto: Not really. We try to keep it distinct. Of course, differences are due to the fact that the Sami population stretches over such a vast area which meant that you did not have cultural exchange all the way from the east to the south.

Viscount Hanworth: Are all the languages written now?

Mr Runar Myrnes Balto: Almost all of them are written now, but with some of the smaller languages which maybe do not have more than a couple of hundred users at best we still have a process of creating a written language.

The Chairman: I think we need to move on and finish the presentation.

Mr Runar Myrnes Balto: The Sami Parliamentary Council was established in the year 2000. It is the co-operation body for the Sami parliaments of Finland, Sweden and Norway. The
Russian Sami organisations and representatives from the Kola Sami Assembly participate permanently in this council. The Sami Parliamentary Council makes decisions on behalf of the entire Sami people, but where the matter concerns Samis in only one nation state, those decisions are made in each particular parliament.

One important issue for the Sami people today is the work with the Nordic Sami convention. The Nordic countries, together with the three Nordic Sami parliaments, started negotiations on the Nordic Sami convention in 2011 following a proposal by an expert group in 2005. The aim is for the negotiations to be concluded in 2016. The objective of the proposed convention is to affirm and strengthen such rights of the Sami people that are necessary to secure and develop their language, culture, livelihoods and society, with the smallest possible interference of national borders.

I will stop here and introduce Mr Gintal to explain a bit more about how we work with the state.

Mr Jon Petter Gintal: Thank you. I am Jon Petter Gintal. I am a Sami myself. I come from the middle of the Sami area, a little south of Runars area. I work in administration in the Sami Parliament. At the moment we have 140 employees in administration. Of course, we have different departments; I work in the Department of Rights and International Affairs, where my role is consultation with the state authorities. That is a main tool for the Sami Parliament in getting to a position to negotiate with the Government in Norway. The agreement is from 2005, and the obligation to consult applies to different types of issue that might affect the Sami directly—both general cases, such as Bills and regulations, and decisions in individual cases. In cases related to the land, the consultation obligation will operate with a view to the traditional Sami territories. The consultation must be conducted in good faith with an objective to achieve an agreement. Of course, we have had some issues and cases where we
The Sámi Parliament of Norway – Oral evidence (QQ 116 – 130)

did not get an agreement with the Government, but in our opinion both sides put a lot of effort into trying to achieve agreement. For instance, the first consultation was about the Finnmark Act in 2005. The background to that was the Sami people’s fight for their rights to manage their land and culture. As Runar mentioned before, the Sami Rights Committee of 1984 addressed Sami legal relations and proposed, among other things, the establishment of a Sami Parliament and finally the adoption of the Finnmark Act. The Finnmark Act transferred about 46,000 square kilometres in Finnmark county from the Norwegian state to the inhabitants, an area larger than the kingdom of Denmark—without Greenland, of course. It is now managed by the Finnmark estate agency. The land ownership position is taken care of by a board of directors with six members, three of whom are appointed by the Sami Parliament and three by the Finnmark county council. The basis for the Finnmark Act is that Samis’ true traditional use of the land and water areas has acquired individual and/or collective ownership, and the right to use land and water in Finnmark county and other parts of Norway. An important element of that is the discussion and recognition of existing rights of use and ownership of land. The proposed Finnmark Commission and Uncultivated Land Tribunal have been set up, so we are now waiting for cases to show up there. The commission is doing its work and the inhabitants of Finnmark can put in their claims to the land. That is in process there. We have already had four reports from the Finnmark Commission, and the land tribunal was set up last year.

Another example of consultations on which we reached agreement is the Norwegian Nature Diversity Act in 2009, the provisions of which are to be considered in the case of any decision that may affect the diversity of nature. The Act aims, among other things, to ensure the basis for Sami culture in Norway, and places an emphasis on Sami traditional knowledge and nature as that basis. Russia implemented certain aspects of that Act.
It is right say that the Sami Parliament safeguards the interests of different local Sami groups, but in certain cases it may be relevant for the state to consult the Sami community through its representative spokespersons. This is most appropriate when the group in question has decided to speak for itself, but of course the state authorities can choose to consult the parties that agree with them. However, normally we see that the Sami Parliament and Sami interest groups have a common view. One example of differing Sami interests is reindeer husbandry. That has a separate representative agency and a tradition of representing itself, so when it comes to regulations and legislation regarding land, it is natural for the state to also consult the reindeer herders’ association in Norway. It is well organised. In regard to specific encroachment cases, the individual rights-holders and individual reindeer-owners should be consulted. The state can do that through a representative of the individual reindeer-grazing districts. Today, many Sami still live in a traditional way and reindeer husbandry is a cornerstone of traditional knowledge in Sami culture. Sami language is particularly important in the reindeer husbandry business; it is a working language. Sami language is a central part of transferring, preserving and maintaining both the Sami language and Sami traditional knowledge.

I will briefly mention our work at the international level. The Sami Parliament has an active role in international negotiations in which indigenous considerations play a central part, especially in the United Nations and human rights bodies. Today we are one of the key players in the World Conference on Indigenous Peoples, which is taking place at the United Nations General Assembly later this month. We participate in the Norwegian delegation at meetings, for example, for the convention on climate change, in relation to biological diversity and at the Barents Euro-Arctic Council. When we attend the international meetings
we have close co-operation with other indigenous peoples’ organisations, especially the
Sami Council, which is one of the Permanent Participants in the Arctic Council.

**Mr Runar Myrnes Balto:** So that was our presentation. Do you have any questions about a
specific area you are interested in knowing about?

**Q64 The Chairman:** I am sure that there are many questions. I ask for one or two
clarifications; this is really going back to my own political culture. You also presumably are
voters in Norwegian national elections as well. Do you have a Norwegian Member of
Parliament who represents you in Finnmark? Is this covered by the standard Norwegian
political structure? I was going to ask about local government and whether you have
representation in that area.

**Mr Runar Myrnes Balto:** I can clarify that quite easily. There is no special representation in
Parliament, neither at national nor local level. There are Sami from time to time in
Parliament, but it is true that none has been part of the Norwegian party structure.

**The Chairman:** What is the limit of powers of the Sami Parliament in Norway?

What can you decide and what can you not decide?

**Mr Runar Myrnes Balto:** We have no legislative power whatever. Apart from the Finnmark
Act, which Jon Petter was talking about, under which we have direct power over how the
land in Finnmark county is used, we do not have any direct power. I usually say that
Parliament limits itself to what we can do, indirectly through consultations et cetera, as well
as the fact that we have self-determination over other issues that are cultural—which is that
in English?

**Mr Jon Petter Gintal:** Sami cultural heritage.

**Mr Runar Myrnes Balto:** Yes, and schoolbooks; we have responsibility for those. Apart from
that, we have mostly indirect influence.
Lord Oxburgh: What about the justice system, police and what have you? Is that national or is it Sami?

Mr Runar Myrnes Balto: It is national, so we have no power there.

Mr Jon Petter Gintal: We have an inner Finnmark court, where everything in the court is in the Sami language, but it is established under the national state authorities.

Q65 The Chairman: Perhaps I may ask another question and then open it out. One thing that particularly interests us is that you mentioned the other Sami people, particularly those in the Russian Federation, and other Russian minorities. Would you like to talk to us a bit more about that? We would find that quite interesting because I do not think that we are going to have a huge dialogue—we have had some already—but it would be interesting to hear about the issues for the Kola Peninsula and how the Russian Federation maybe deals with these issues differently from other Nordic countries.

Mr Jon Petter Gintal: We have in the past two to three years seen a development in which indigenous peoples’ representatives are being pushed out from their main organisations, such as RAIPON, whereby people from the Government have been put there instead of their chosen representatives. We are very worried about that development because RAIPON is a very important organisation. It is one of six indigenous peoples’ organisations in the Arctic Council, and we see that we cannot now trust their representative there when they attend meetings because we know that the Government of the Russian Federation are controlling that person. We also have meetings with former members of RAIPON. They were very important people in the organisation and they are saying that they had a hard time with the Russian Government, who have been watching them and doing some harm to their families and stuff like that. So we are very worried about that. Our president has already had a couple of meetings with the Norwegian Government and we are trying to get political
leaders in Norway to take a strong position against that. They will now talk about human rights and democratic rights.

Q66 Lord Oxburgh: What do you see as the main threats to the culture that you are set up to preserve?

Mr Runar Myrnes Balto: That is a very broad question. First, I might as well add to what Mr Gintal said. We also have seen instances in which indigenous leaders who have returned from meetings abroad have been arrested on arrival and punished for going out and working on indigenous issues.

Lord Oxburgh: Is that in Russia?

Mr Runar Myrnes Balto: Yes. There have been some cases where international indigenous rights advocates in Russia have been arrested for a brief period, probably as a scare tactic.

Lord Soley: Are you able to talk to anyone from Russia in an official capacity? For example, if a delegation from the Parliament asked to see the Russian ambassador in Norway, would they see him or not?

Mr Jon Petter Gintal: The president had a meeting with the ambassador—

Lord Soley: Because that has happened; the other Sami communities in Finland and Sweden, have had similar meetings with Russian ambassadors there.

Mr Jon Petter Gintal: I am not sure about that. I cannot answer that.

Lord Soley: So you only have a limited way in which to talk to the Russian Government about this. What happens on the Arctic Council, because it has a role regarding indigenous people? Does it take up your concerns or not?

Mr Runar Myrnes Balto: Do they?

Mr Jon Petter Gintal: Yes, they try to do that but—

Lord Soley: They do not get anywhere.
Mr Jon Petter Gintal: But it is a strange situation now on the council. Many member states are not sure how to deal with it.

Lord Soley: How does your relationship with the Sami Council work? Do you have any relationship with the Indigenous Peoples’ Secretariat?

Mr Runar Myrnes Balto: The organisation that I represent—the Norwegian Sami Association, which is also now the ruling party in the Parliament—is also a member organisation of the Sami Council. Yes, we are working in both the organisations. This is what they do.

Lord Soley: Is the secretariat very effective for you? It struck me that it only had three people working for it. Could it do more if it had a bigger role?

Mr Jon Petter Gintal: I think it needs more resources to build up more capacity. It is of course serving all six indigenous peoples’ organisations including the Sami Council. We attend meetings and are a part of the Norwegian delegation, but we co-operate very closely, especially with the Sami Council. For example, for the latest period the representative on the Sami Council was Miss Gunn-Britt Retter. She was for a period also a Member of the Sami Parliament—the vice-chief chief of this organisation. There are close ties between the Sami Parliament and the Sami Council.

Q67 Lord Addington: This question is born out of my experience. Is there no turf war or conflict over who is senior within the group? Some say, “You speak to us”; others say, “No, no, you speak to us”. Does that occur? Has it occurred in the past? Is that your experience because there are a lot of groups involved? I am sure that it happens accidentally, but I wonder whether there is a culture of it?

Mr Runar Myrnes Balto: My experience is that we have our different roles and ways of working. That is why my organisation is working through both the Parliament and the Sami
Council because there are different things that we can achieve. I would not say that there was a turf war. I am always a representative.

**Lord Addington:** Is it not a regular part of what goes on?

**Mr Jon Petter Gintal:** I think it is right to say that the Sami Parliament is not against the construction of the Arctic Council, involving six organisations. But I know that the Sami Parliamentary Council at its last meeting asked for a status in the Arctic Council. I am not sure what kind of status, but it is not among the Permanent Participants but has more of an active observer role there. For it to be more independent, it should be outside the state delegations.

**Q68 Lord Soley:** The United Kingdom is not a member of the Arctic Council but we have observer status. Is there any role for the United Kingdom or other countries to have observer status as regards addressing the issues of indigenous peoples?

**Mr Jon Petter Gintal:** I think so. It is good to co-operate broadly, and I believe that observer states can also look into different issues that concern indigenous peoples and maybe help them to build up confidence and capacity.

**Lord Soley:** As regards international companies that maybe do mining or look for resources in areas where Sami have a predominant presence, do you feel that those organisations and companies relate well to the Sami people? Are you able to negotiate and discuss with them?

**Mr Runar Myrnes Balto:** I would say that they do not relate very well to the Sami communities. One example is from Sweden. I do not know whether you know the Kallak mining project, under Beowulf Mining. The British company does not really have a track record of dialogue with local Sami groups. This also relates to your question. I identify extractive industries as maybe the biggest challenge to—

**Lord Soley:** Sorry, what was the biggest challenge?
Mr Runar Myrnes Balto: Extractive industries. We are seeing a wave of companies wanting to come and start mining projects in areas that have for hundreds of years been grazing land for—

Lord Soley: What could companies do to improve the situation? If you were talking to me as a representative of a big company, which I am not, what sorts of things would you be asking me to do?

Mr Runar Myrnes Balto: It would depend on the kind of project and on how big it was. I might ask you to go home.

Lord Soley: You might ask me to do what?

Mr Runar Myrnes Balto: To leave and go away. It would seem like an intrusion into a way of life.

Lord Soley: Okay, but if you then agreed that they could then do something, what would you then be asking for? Would you ask the company to help with the schooling, health and education of the Sami? Would you ask for other things from the company? What would you want the company to do?

Mr Runar Myrnes Balto: This differs from area to area because it is not the Sami Parliament with which we would be negotiating.

Lord Soley: No, but what do you want it to do? You must have some knowledge of what the Parliament would want.

Mr Runar Myrnes Balto: From the perspective of those who use the land, first they need help to get other places to keep their reindeer. It is a very complex issue and we are constantly working on improving the regional legislation to give the Sami people, reindeer herders in particular—
The Chairman: Can we have some clarification here? Say an extractive industry wants to come into an area that is predominantly Sami. In Britain you have to go through a process called planning permission, involving environmental surveys and all that sort of stuff, and all sorts of national agencies and local government when making a decision. It can be very complicated. Is that roughly how it works here and are the Parliament’s representatives included specifically in that process in your areas? Can you give us an overview?

Mr Jon Petter Gintal: We have the Planning and Building Act. The Sami Parliament is a hearing body for that, and we send our views into that process. That is run by local municipalities. We are in a position to object to a plan, which is then sent up to national level.

The Chairman: You have a veto at local level, and then that goes up.

Mr Jon Petter Gintal: Then we consult the Ministry of the Environment.

Viscount Hanworth: Can you be more specific about the various factors that are impeding the traditional Sami way of life? There are certainly the extractive industries. There is probably also building in places where there should not be. Also, how is climatic change affecting you? Could you wrap all those issues into a description of the current influences that impede the Sami way of life?

Mr Runar Myrnes Balto: If we define the Sami way of life as being one of using renewable resources, such as reindeer herding and fishing, for instance—

Viscount Hanworth: And mobility, presumably. You do move.

Mr Runar Myrnes Balto: There are a number of factors. First, we do not know what the effect of climate change will be on reindeer herding, for instance. There are a lot of theories about how Sami fishing will be affected by climate change. We have a general belief that the local Sami fishing, which is on a small scale, is more capable of adapting to climate change
than the bigger fishing industry, which is dependent on cod, and the cod might move northwards. Generally, we are probably able to adapt to climate change in a relatively good way. When it comes to mitigation measures against climate change, we need more renewable resources—we need to put up windmills, et cetera—that is also seen as a challenge to the Sami way of life. Where do you put the windmills? They will have to be where the reindeer are. So it is a difficult situation. On the one hand, we need to meet the challenges of climate change, but the result may be damaging to us.

**Lord Oxburgh:** The reindeer herds migrate, do they not?

**Mr Runar Myrnes Balto:** Yes.

**Lord Oxburgh:** Over what sort of area, typically, would a herd migrate? I have no feeling for the numbers.

**Mr Runar Myrnes Balto:** Do you want to deal with this?

**Mr Jon Petter Gintal:** Normally they are by the coast during the summertime and in the innermost areas in the wintertime.

**Lord Oxburgh:** How far would they travel and how many are in a herd? What sort of numbers?

**Mr Runar Myrnes Balto:** It depends. Anything from a couple of hundred to 10,000 in the biggest herds.

**Lord Addington:** And they travel hundreds of kilometres?

**Mr Runar Myrnes Balto:** Yes, definitely.

**Viscount Hanworth:** Do you use motorised transport?

**Mr Runar Myrnes Balto:** Yes.
Viscount Hanworth: Perhaps those modern aids may also militate against the eventual survival of the Sami way of life. Is that an issue, or are you comfortable with importing modern technology—


Mr Runar Myrnes Balto: The Sami culture is very comfortable with that.

Viscount Hanworth: You are modern people, are you not?

Mr Jon Petter Gintal: That is for sure. Of course, we work in a huge area, so we are very used to picking up new communications stuff fast. The Sami people have always been at the forefront of using new technology.

Q69 Viscount Hanworth: You used the phrase “forced cultural assimilation” as being a big threat, but there is also another threat of a natural cultural rift. To what extent is that occurring within the Sami community groups? There are some thoroughly urbane Sami, the phrase being derived from “urbanised”, I suppose. Is that a general characteristic of the Sami these days? Are they participating in urban culture as much as in the rural culture?

Mr Runar Myrnes Balto: I would say so, yes. Of course, there has been and still is a huge urbanisation and modernisation of the Sami culture, so I would say that we are very much connected to the rest of the—

Viscount Hanworth: To the mainstream culture.

Mr Runar Myrnes Balto: Yes, to the mainstream culture. That is why we in the Sami Parliament use most resources on preserving the language in a modern culture. It is easy things, such as getting applications for your phone in the Sami language. We have a different alphabet, so to be able to use our alphabet on our cell phones is a big achievement for a small language.
Viscount Hanworth: What if you unified the language, if you did some sort of consolidation of the diversity?

Mr Runar Myrnes Balto: That is very controversial.

Viscount Hanworth: I am sure it is; that is why I raised it.

The Chairman: I come from a part of the United Kingdom called Cornwall, which is on the Celtic fringe. We have a language which died and is now being revived, but there is great rivalry between two pronunciation schools, so I understand that you can get into very difficult areas when you try to impose standards on these things.

Viscount Hanworth: I have an affiliation with Cornwall.

The Chairman: I know.

Lord Oxburgh: In terms of education, do the Sami people have enough money for schools from the central government? Is there a schools problem, or are resources more or less all right?

Mr Runar Myrnes Balto: We go to public schools and in principle, I would say that the legislation is clear. You are supposed to get your Sami education in school, but is it good enough? Not always. That is very much connected to the fact that we are so scattered around the country. There are Samis who go to schools where there are no other Sami children. They have the right to get their Sami education. Those schools do not always meet expectations.

Lord Addington: I have one point, going back to the extractive industries. It strikes me that there is what sounds like the fairly normal ritual dance of opposition to them. Do you have a template for what is acceptable, what is the least intrusive way of bringing a mine or any other form of extraction or a standard set of things, such as, “We will drop our opposition if you do X, Y and Z here, and then you must maintain it in certain ways”?
What often happens, to follow Lord Teverson’s original point about planning, is that people will say, “You can do this, but it is normal to provide services for the community”. As we have a similar process, I imagine that that is true of the urban environment. I wonder whether you have developed that across all the Parliaments? Do you have standardisation as you have for travel?

**Mr Runar Myrnes Balto**: We are in the process of making that kind of framework. The Norwegian Sami Parliament had a discussion about this earlier this year. What is our policy on these issues? Where are we now? We do not say no in principle to all mines, but we are saying that we need to change the legal framework first, so that there is a framework for us to be able to say no if we do not get this and that, but we have not defined that.

**Lord Addington**: So you are starting to embrace the process that these are minimum standards that are required to make this sustainable for your culture?

**Mr Runar Myrnes Balto**: I would say that politically we are heading that way. At some point, we will define that, but we are not there quite yet. This is a process that is taking several years.

**Mr Jon Petter Gintal**: I can add that in a previous session of the Sami Parliament, when we had a different majority and a different president, it developed guidelines for how to deal with mineral companies. That was based on negotiations. In its last decisions, it said that it would continue to develop those guidelines. We have a translation of the guidelines in English, if you would be interested.

**The Chairman**: That would be interesting to see, yes. One thing that struck me during your presentation was the picture of the Sami Parliament. If I looked for an organisation that looked excited, happy, successful and upbeat, it is that picture that comes to mind.

**Viscount Hanworth**: Say “Cheese”.

1065
Q70 **The Chairman:** If you took a picture of our House of Commons, they would all look grumpy and grey. You have clearly gone through a lot of changes as a people over the past 20 or 30 years. Do you and your people see that as being successful? Do you feel that this is really working? There may be a long way to go and further developments to come, but do you have a model for yourselves that works well? Is the standard of living—when I say that, I mean welfare or the health of the community—better? Give us an overview of that. Are you a success story? We get the impression that in other areas it is still very difficult, although other people have found different solutions.

**Mr Runar Myrnes Balto:** In general we feel successful in that we have the same standards of living as the rest of the population. When it comes to welfare and social issues, et cetera, we do not have poverty or a lot of other issues that a lot of other indigenous people are struggling with. But if you ask the Sami population as a whole whether we are satisfied with the situation—the position of the Sami Parliament, for instance—I think that opinion would be pretty much divided between a yes and a no camp. A lot of people would want a different position for the Sami Parliament when it comes to self-determination. I do not think that there is a good answer to that: it is both yes and no, it depends on who you ask.

**Viscount Hanworth:** Your answer must be specific to the Norwegian Sami, in that the Russian Sami have a very different experience. Can you tell us a little about their experience?

**Mr Runar Myrnes Balto:** Yes. My understanding is that, as with other indigenous people in the Russian Federation, they are struggling with poverty. They are definitely not a success story. They do not have any rights connected to their indigenous people status.

**Lord Addington:** Following on from that, would you say that you were on a par in terms of political and cultural representation with the Sami in, say, Sweden and Finland? Would you say that you are in much the same place, or is there a great difference between you?
Mr Runar Myrnes Balto: The general understanding is that we in Norway have come the furthest and that Sweden and Finland are following after.

Lord Addington: Is there a general political will to allow that to happen in those two states?

Mr Runar Myrnes Balto: To have us in the same position?

Lord Addington: If you regard yourselves as being in the best political position, is there a political culture and will in Finland and Sweden to bring them to a similar place?

Mr Runar Myrnes Balto: Probably not at the moment, but this is of course a continuous debate in those countries. This is what we are hoping for with the Nordic Sami convention that I mentioned earlier: to standardise, first, the legal position of the Sami people within the different countries.

Mr Jon Petter Gintal: If you take a look at the budgets of the different Sami Parliaments, the Norwegian Sami Parliament is way higher than that of Sweden and Finland.

Viscount Hanworth: It seems as though the organisations of the Sami people in Finland and Sweden predate your own organisations. Is it not true that they got rights sooner than you did?

Mr Runar Myrnes Balto: Yes, on the Finnish side it was a bit special. It was not really a parliament that was established in 1973. I do not know whether you know the story about that. They had an organisation that was called a parliament but it was not as it is in its current form. It was established in the 1990s. As a democratically elected body—a parliament—it was the first of its kind. It was copied in some ways by the other two states but with different systems. For instance, we do not have the same electoral system for electing our representatives.

Mr Jon Petter Gintal: It is important to build up strong Sami institutions, including some parliaments, to cope with the changes that are coming very rapidly in all areas. That is the
way to deal with the changes. We are now seeing that a lot of the work that the Sami Parliament is doing is to build up those institutions—to have a strong Sami university college, to have Sami local museums that work in different fields and build up Sami society in that way, and to have spokespersons for the Sami people.

**Q71 The Chairman:** One area where you are well ahead of us, judging by our all-male delegation here, is—I mean this very seriously—in gender equality. You seem to have got through that issue, whereas in the British political establishment we have not yet done so.

**Mr Runar Myrnes Balto:** It is 50/50 in the Parliament for this third period.

**The Chairman:** Maybe we have some things to learn from you on that. Can I just come back again to Lord Soley’s point about businesses coming into the area? I know we are concentrating on mining and the extractive industries but those are the most disruptive and obvious. Can you point to good examples of where companies have taken the right approach and have not just followed the legal requirements of the Norwegian state but have engaged in a way that you have found positive? Is there anybody who has done that? Can you describe it at all?

**Mr Runar Myrnes Balto:** Do we have any?

**Mr Jon Petter Gintal:** We have one good example—the oil company, Eni, who are exploring for oil at Hammerfest in the Barents Sea. They had a lot of meetings with the Sami Parliament before establishing this business. They used ILO Convention 169 as the basis to consult with the Sami Parliament on issues that affect the Sami people. The solution there was not to bring the oil to the land but to have everything offshore. When they are transporting by helicopter, they try to avoid conflicts with the reindeer herders and the Sami fishermen.

**The Chairman:** And has that worked?
Mr Jon Petter Gintal: Yes, so far it has worked and we are still in a positive dialogue with them, but they are not done with their work yet.

Mr Runar Myrnes Balto: We will see.

Viscount Hanworth: You are monitoring them.

Mr Jon Petter Gintal: Yes.

Mr Runar Myrnes Balto: There are more examples on the Swedish side of the Sami people where mining industries have made deals with the reindeer herders. The Sami people are not saying no in principle but there needs to be—I do not know the English word—

Lord Addington: Compromise and dialogue.

Mr Runar Myrnes Balto: Yes, and we need to get something back.

Viscount Hanworth: Quid pro quo.

The Chairman: What about British companies? Have you dealt with any companies from the United Kingdom or have they not been active in the area?

Mr Runar Myrnes Balto: I do not know whether they have been in Norway.

Mr Jon Petter Gintal: I cannot remember but I know that they have social and corporate responsibilities. British Gas has a good one there which we have used as an example for other companies in the whole area but we have not been in dialogue with them on projects in the Sami area.

Mr Runar Myrnes Balto: Most of them are Norwegian. I cannot think of any British companies that have come to northern Norway.

Mr Jon Petter Gintal: Most of the mining companies that come up here and do exploration work are Canadian-based and Australian-based.

Mr Runar Myrnes Balto: Or Swedish.

Mr Jon Petter Gintal: And of course Swedish.
Q72 Lord Soley: May I ask with some nervousness about the economics of herding reindeer? I have no knowledge of herding reindeer; I have limited knowledge of herding politicians, which is a bit like herding cats, so it is difficult. It strikes me that, economically, it must be increasingly attractive not to herd reindeer but, if anything, to farm them without travelling vast distances. Is that right or does it misunderstand the nature of reindeer?

Mr Runar Myrnes Balto: I think it misunderstands the nature of reindeer. It does not occur.

Lord Soley: It does not occur, so you could not ranch them or contain them in a set area and herd them like that. The reason I am asking is that it seems that with all the pressures on you, and with reindeer herding being so important to your culture and economy, there must be some risk to it.

Mr Runar Myrnes Balto: I do not know if there have been any experiments with farming reindeer but I know that it is generally regarded as being a violation of our traditions because the reindeer is supposed to live in the wild. It is a wild animal, even though we herd it.

Lord Soley: In my limited experience of these sorts of things in Britain, deer lived in the wild but we now farm deer on farms. I am asking this because I am concerned that it is quite hard to see how in, say, 50 years’ time that culture will be as strong as it is now. I can see why you do not want to lose that. I can see some attractions to it, particularly when I think of my more difficult political times and I might have wanted to do it myself. But there must be a possibility that that practice will decline quite significantly, for economic reasons.

Mr Runar Myrnes Balto: There is that possibility, of course, but although it is crucial to our culture we are not actually that dependent on it economically. It is only by a limited amount. On the Norwegian side, only 5% of the Sami population are dependent on reindeer herding.

Lord Soley: That is less than I thought.
Lord Oxburgh: But would it be true that reindeer can live on land that you cannot really use for anything else? Is that not the situation?

Lord Addington: That is, using reindeer agriculturally.

Mr Runar Myrnes Balto: In many ways, yes. They can live quite well in the mountains.

Lord Oxburgh: So it is not such a threat with competitive use.

Mr Jon Petter Gintal: But we see a difference in Finland, especially where they bring food to the reindeer. That is more common than here in Norway but we see it if there are difficult times during winter.

Lord Addington: So elements of ranching or farming are actually involved in it.

Mr Jon Petter Gintal: That is becoming more and more usual.

Q73 The Chairman: Can we come back to the Italian company, Eni? What exactly have they done that was right? What did they do that made you think, “That’s the right approach”?

What was the difference?

Mr Jon Petter Gintal: They had active communication with the Sami Parliament.

The Chairman: Right from the beginning?

Mr Jon Petter Gintal: From the start, yes. They did not say, “We are doing this”; they asked, “Can we do this?”. They had a really different approach.

The Chairman: Did they ask how to do it?

Mr Jon Petter Gintal: Yes, they asked for advice—“How do we deal with this issue? How can we do the helicopter transport in the best possible way?”—instead of just saying, “We are going to do it like this”. So they went out and talked to both the Sami Parliament and the reindeer herders’ and fishermen’s organisations.

Lord Addington: Did they complain about extra costs at all? Presumably, there would be some costs but they might avoid legal challenges. I do not know about that but here we
would reckon that a couple of good lawyers are worth several days’ building construction work.

The Chairman: But sometimes local people can say, “Why don’t you do it this way?”, and you find a less expensive way of doing it.

Lord Addington: A study like that which says, “This is sensible and saves money, or will cost very little”, tends to encourage people to listen.

Mr Jon Petter Gintal: They also made a good initiative in having meetings with Sami organisations and institutions. I know that one major Sami institution is working together with Eni and another company, Statoil, to come up with a plan for how to deal with the future oil and gas development in the Barents Sea. If we were to bring it to the land, how can we find the best place to put it so that it does not influence the Sami culture so much? They are doing that work and putting resources into planning it, so it is a good initiative.

Mr Runar Myrnes Balto: They probably saved some money as well, and a lot of trouble.

Lord Addington: That is what I am saying. There are real savings in avoiding conflict in a developed legal structure.

Q74 The Chairman: Certainly you must be—I was going to say “upbeat”—as people in the Arctic are some of the most successful of the indigenous peoples. Are other groups envious of you? Do they look at what you are doing and think that you are fine and that you have got it all sorted out? How does that work? You have certainly made huge strides in what you are trying to achieve, have you not, against the rest of the world going in the opposite direction?

Mr Jon Petter Gintal: Internationally, many indigenous peoples look up to the Sami people because we have developed capacity and we are well skilled in negotiations. We are well educated and we have had at least 25 years of experience of dealing with elections and democratic processes. So we can work very effectively in the UN and other international co-
operation bodies because of that—because we can read the room very easily. Other indigenous peoples are more critical of state authorities; they see more challenges, but we also see opportunities. However, we also have similar indigenous peoples such as the Inuit, who have a Parliament in Greenland, and there are other parliaments, so there are other good examples. However, the key is to give indigenous peoples power and help them to educate themselves and build up their institutions, and, if possible, to give them a democratic channel, such as a parliament.

Mr Runar Myrnes Balto: There is an element of solidarity internationally. We all want to share our experience; we have had several delegations coming to visit us here.

Q75 The Chairman: We are coming to the end of the session. I feel that, as parliamentarians to parliamentarians, we are doing this all one way. There may not be, but if there are any questions that you wanted to ask us about what we are doing, we would be pleased to answer them, but you do not have to.

Mr Runar Myrnes Balto: I did not quite get what the result will be of your committee’s trip.

Lord Oxburgh: What will our output be?

The Chairman: Good question. In effect, we will produce a report, of something like 100 pages, in which we will make a number of specific recommendations that will cover all the areas of the study. That will be a public document and we will release it to the press. We hope it will be covered nationally to some degree, because the Arctic is of interest to people these days. Also, we hope it will be noticed by more specialist people internationally. We will then, as Parliament, submit that to our Government. The Government then have to respond to Parliament—to each of our recommendations—and say, “Yes, we will do that”, or that they will not or might do other things. There will then be a debate within the House of Lords,
when we will have the Minister who is in charge of that area of foreign affairs in the House of Lords, and again, the Government have to respond to what we are doing.

One of our challenges is that this committee exists only for this parliamentary Session, so after we have done the report, our job is done. However, as we all know as parliamentarians, it is important not just to leave things at that point but to continue to follow up. I am sure that that will be very much in the minds of all of us on the committee.

About half of us are sat here—and we do have some females on our committee as well. We are up to three. I expect that, as individuals, and I, as the then previous chair, will ensure that we continue to pursue these recommendations and issues with the new Government of whatever sort after next May, and ensure that that stays on the agenda.

On the whole, House of Lords reports are well regarded, and they can often lead to changes. However, it is then very much about what the British Government decide to do as regards their work as an observer on the Arctic Council and other international fora—the United Nations, the International Maritime Organisation—as regards the transport and pollution side, and all those other areas. Therefore we are part of a process of trying to get greater concentration on this area and better government policy, but I hope that we will also better inform other international agencies.

**Lord Soley:** You will see the report; it will be on the website, and obviously we will let you have copies.

**Lord Addington:** And it becomes a jumping-off point for the next time that Peers look at studies et cetera; it will become part of the background.

**The Chairman:** Is there anything else we can help with? This has been very useful indeed.

We are far better informed on these issues than we were when we had breakfast this morning. On behalf of everybody I will not just say thanks but offer you our congratulations...
on what you are achieving here in Norway. We wish you every success in what you are trying to achieve, with all the changes that are going on. Thank you very much indeed for coming and spending time with us. We look forward to sending you our report and the transcript of this session.
Scott Polar Research Institute, Scottish Association for Marine Science and British Antarctic Survey – Oral evidence (QQ 260 – 272)

Transcript to be found under British Antarctic Survey
Scottish Association for Marine Science, British Antarctic Survey and Scott Polar Research Institute, – Oral evidence (QQ 260 – 272)

Scottish Association for Marine Science, British Antarctic Survey and Scott Polar Research Institute, – Oral evidence (QQ 260 – 272)

Transcript to be found under British Antarctic Survey
Professor Andy Shepherd, Professor Daniel Feltham and Professor Peter Wadhams – Oral evidence (QQ 29 – 36)

**Professor Andy Shepherd, Professor Daniel Feltham and Professor Peter Wadhams – Oral evidence (QQ 29 – 36)**

Transcript to be found under Professor Daniel Feltham
Professor Andrew Shepherd – Written evidence (ARC0045)

- I am director of the Centre for Polar Observation and Modelling, a NERC-funded centre based at the University of Leeds and aligned with the National Oceanography Centre and the British Antarctic Survey. CPOM provides a UK national capability for developing satellite observations and numerical models of ice in the polar regions, including the continental ice sheets of Antarctica and Greenland, and the sea ice in both hemispheres.

- We also provide scientific leadership for the European Space Agency’s CryoSat mission, the first fully-functioning satellite mission especially designed to monitor the polar regions.

- The information I will present today is based upon the very latest satellite assessments and model predictions, and incorporates work from many CPOM staff. I would like to credit Andy Ridout, Julienne Stroeve, and Rachel Tilling for their individual contributions, and I would also like to acknowledge my late colleagues Katharine Giles and Seymour Laxon, whose research provides the foundation for our sea ice observations.

Possible questions for witnesses

1. What are the short-term and long-term causes of changes to sea ice extent in the Arctic? How does the ice respond to these different drivers of change?

- Over the last 50 years, changes in sea ice extent are largely (50-60%) explained by rising GHG’s as a consequence of their disproportionate effect on regional temperature. For example, the duration of the sea ice melting season has lengthened by 5 days per decade since the late 1970’s.

- Short term fluctuations are caused by weather, and can be significant. For example, the record minimums of 2007 and 2012 have been attributed to the combined effects of long-term warming and abnormal weather conditions over those summers. This has an impact on our ability to detect trends, which is why we need long-term records.

- There are indirect factors too, such as the ice-albedo effect and the resilience of the sea ice pack as the proportion of older and thicker ice decreases. For example, if the sea ice pack in 2012 were as thick as it was in the 1980’s, the intense storm that destroyed a large section of ice would not have had the same effect.

2. What techniques have been used, within your own work, to measure and monitor Arctic sea ice? Do different techniques produce significantly different results or differing trends over time?

- Arctic-wide sea ice extent is always mapped using the same technique, passive microwave imagery, because the measurements (i) are not sensitive to cloud cover, (ii) can be acquired at night time, (iii) allow ice and open water to be easily discriminated, and (iv)
have been collected since the late 1970’s. There are no significant differences in sea ice extent trends derived from this record.

- There are a range of techniques for mapping sea ice thickness, including surface-based measurements of sea ice thickness, ocean-based measurements of sea ice draft (the part below water), and airborne or satellite measurements of sea ice freeboard (the part above water).

- Satellite-altimeter derived estimates of sea ice thickness are the only technique capable of monitoring Arctic-wide changes. Although there are different approaches to estimating sea ice thickness using the various satellite or aircraft data sets that have been acquired, differences between coincident measurements from different techniques are at the 10 cm level, which is small in comparison to the typical thickness of a sea ice floe (180 cm).

- Larger differences do emerge when comparing estimates of Arctic-wide thickness. This is because the Arctic sea ice pack is not uniformly thick, and because aircraft and older satellite missions were not able to survey it in entirety. Sea ice tends to be thickest in the central Arctic, and thinnest at the margin (a Jaffa Cake is a good analogy). Missions that were not able to survey the central Arctic missed some of the thickest ice, and could have a tendency to underestimate how much ice was really present.

3. How has the volume and extent of Arctic sea ice changed over the past decade? Did scientific research or models predict the extent and nature of that change with any degree of accuracy?

- The extent of summer sea ice has declined, on average, by 1.4% per year since 1979. The rate of decline has increased over time, and the seven lowest extents have occurred in the past 7 years.

- Measuring trends in thickness and volume is far more difficult, because the capability of satellite and aircraft sensors has improved over time, and so we have to take into account the inferior capabilities of older missions. That’s not an easy thing to do. What we can say, with confidence, is that the Arctic sea ice pack has thinned over the past two decades, and that it is now composed of younger ice than it was in the past.

- The most reliable assessments of thickness and volume change come from CryoSat as it surveys the entire Arctic, but the mission has only been operational for 4 years which is too short to provide long-term trends. What CryoSat shows is that between 2010 and 2013 the volume of sea ice declined by 8 and 2.5 and per year in summer and winter, respectively, and that these losses were regained last winter thanks to lower melting in summer 2013.

- All global climate models predict the decline in sea ice extent that has occurred over the satellite era, but they have tended to under-predict how rapidly it has been declining. For
example, of 37 IPCC climate models, only 5 reproduced the observed trend with sufficient accuracy to allow forward projections, and 1 in 7 produced trends indistinguishable from zero.

- Models skill in predicting observed and future trends in sea ice thickness or volume is not currently assessed.

4. How is the extent and volume of Arctic sea ice likely to change in forthcoming years? When might we see the first ‘ice-free summer’, and the onset of dependably ice-free summers? Is the extent of Arctic sea ice likely to become more, or less, predictable?

- The Arctic sea ice cover is expected to continue to decline, with the possibility of ice-free summers in the next 20-30 years. Climate model predictions tend to be at the upper end of this range, whereas projections of past observations tend to be at the lower end.

- However, natural climate variability and weather conditions can certainly bring about a temporary recovery despite the long-term trend, as was seen last winter, and so there is considerable uncertainty in the date of ice-free summers. It’s not as simple as projecting the current trend out into the future.

- If the Arctic sea ice continues to thin, then it will eventually become too fragile to survive the summer melt season and thus we will have the ability to say with confidence that the region will be ice free at times.

- But until that point is reached, predictability is likely to worsen because extreme weather conditions will tend to have a larger impact on the ice cover.

5. What, in your view, are the negative impacts of a further reduction in sea ice cover likely to be? Are there any positive impacts?

- There are many negative impacts of reducing sea ice cover for the Arctic region and the people that live in it. These include loss of ecosystems and species, coastal erosion, loss of cultural identity for local communities, increased pollution and risks of oil spills, changes in atmospheric circulation patterns, and increased storm surges.

- Loss of Arctic sea ice may present new and shorter shipping and tourist routes, depending on which ice is lost first, and will allow relatively easier access for offshore resource extraction. These apparently positive impacts are, however, an economic consideration, as there are alternative solutions, and on that basis their potential merit ought to be considered against the economic implications of the negative impacts.

- In particular, it is important to recognise that changes in Arctic sea and land ice cover do have major impacts beyond the Arctic region. The ice-albedo feedback is an important regulating mechanism of global climate; reductions in sea ice amplify the effects of global warming. There is evidence that a reduction in Arctic sea ice will affect patterns of atmospheric circulation, evaporation, and precipitation in North America and Europe.
Increased losses from the Greenland ice sheet will cause global sea levels to rise. These changes have significant economic implications.

- Balancing the relative merits of the negative and positive impacts is challenging, because the cost of negative impacts is borne directly by states and consumers, whereas the benefits of positive impacts are felt by commercial organisations. So the issue can become easily politicised.

6. How important is UK scientific expertise when it comes to measuring Arctic sea ice, and making predictions about its future? To what extent does UK research influence policy in the Arctic states, or the Arctic Council and its working groups?

- The UK has world-leading expertise in observing and modelling Arctic sea ice, and this expertise is distributed among HEI’s and national centres.

- NERC provides, through its centres, logistical capability for ocean-based and airborne experiments, and the recently announced procurement of a new polar research vessel will strengthen these capabilities.

- The UKMO maintains a world-leading effort in global and regional climate modelling, with a dedicated effort focussed on the polar regions.

- The UK subscription to the ESA provides a mechanism to influence current and future satellite missions, for example CryoSat, which is a UK led mission of major international importance in the context of polar research.

- The CPOM provides world-leading expertise in observing and modelling Arctic sea and land ice.

- It is not easy to quantify the influence that UK research has on the actions of the either the Arctic Council or on Arctic states, as their decisions will inevitably be based on a range of considerations. However, if one examines the scientific literature, 9 % of all papers on the topic include a UK organisation, rising to 18% in last decade. For comparison, the UK contributes approximately 4% of global expenditure on research and development. So the relative impact of UK research is disproportionately high.

7. The Government published their Arctic policy framework in October last year. In this document, the Government state that “Science . . . remains central to the UK’s approach to the Arctic”. Is this a view that you share, and do you believe that the Government uses UK scientific expertise on the Arctic effectively?

- I agree that the UK’s main contribution to the Arctic region is in improving our scientific understanding of it. It’s important to note that the UK makes scientific contributions in all elements of the Arctic climate system, including the ocean, sea ice, land ice, the atmosphere, and the terrestrial and marine ecosystems.
I would be surprised if the Government were able to use UK scientific expertise on the Arctic effectively, as it is widely distributed among many organisations, and there is no obvious activity overseeing the combined effort. For example, Arctic ocean expertise in NOC, land and sea ice is in CPOM and BAS, terrestrial ecology is in Sheffield and Edinburgh, atmospheric science in Leeds, climate in Reading and UKMO HC, marine ecosystems in SAMS. So I think that there is a strong argument to establish a scientific body to appraise and perhaps coordinate this spectrum of research.

October 2014
Submission to be found under Dr Sheldon Bacon
Q98 The Chairman: I welcome our witnesses from Statoil.

Mr Rúni M Hansen: Thank you very much. First, I am pleased to be here with you. We hope to have a good time for the coming 45 minutes. I am Mr Rúni Hansen. I am actually from the Faroe Islands and working for Statoil, commuting between the Faroes and Oslo for the time being. I am the vice-president and head of the Arctic Unit in Statoil.

Mr Erik Haaland: I am Erik Haaland. I work for Rúni. My responsibility is non-technical risk, which includes stakeholder relations, government affairs, communications and sustainability issues.

The Chairman: Okay, good. Is there anything you would like to say to start with? You do not have to, but you can if you like.

Mr Rúni M Hansen: We could do it like this—I do not know the framework for these things or which way you would like to do it. I could just explain why we are in the Arctic and how we see the Arctic, if you want. How do you want to do it?
The Chairman: That would be useful, but if you could keep it to five minutes at the most, that would be great.

Mr Rúni M Hansen: I will keep it to five minutes, that is no problem. It is quite important for us, when we are talking about the Arctic—as you said at the beginning, there are some issues with the Arctic—to say that Statoil has been in the Arctic for many years. We would like to divide the Arctic into three categories, because the Arctic is not only the Arctic as many see it. The first category is the workable Arctic. It is the Arctic where we have hardly any ice, for example, the Barents Sea. We have been there for more than 30 years, drilling more than 100 wells in this part of the Arctic. We can also add the sub-Arctic with the east coast of Canada, where we are currently drilling as well.

The next category is the stretch Arctic. That is where we need some more technology, but we are still present there with exploration, for example, in the Beaufort Sea in Canada. Then we have the third category of the extreme Arctic. That is where you have ice most of the year, or for many months of the year—for example, in north-east Greenland—where we do not see that we will have any development for the coming many years. You can also see that from our licence period in north-east Greenland: it is 16 years, so it is a very long perspective.

It is very important for us to keep this in mind, to see that there are different challenges in the Arctic. In some parts, like in most parts of Norway, we can see that the development of the industry has gone from shallow water to deeper water and to more challenging areas. It is very important for us to take a step-by-step approach in these different categories. We must not go faster than technology allows us to in the Arctic.

I just mention my third point, after the categories and the step-by-step approach. Collaboration is very important in the Arctic between industry, academia and subcontractors
and everyone, not least the local people in the Arctic. The way we have been doing it in northern Norway is very much in co-operation with local communities. We see that to be crucial in our development of this region.

For my final minute, I just say: why do we as a company want to be in the Arctic? It is very simple—we can see that the world needs energy, and will in future as well. Although we are trying to have more of other sorts of energy, such as wind energy, we can see that fossil fuel will be a big part of the energy mix for the future. To take 2040, for example, we believe that 60% of the energy mix will be fossil fuel, so we will still need a lot of energy in future, and current fields are declining, so just to fill the gap, we really need more energy, and we know that 25% of the resources that remain to be found are in the Arctic. That is the big picture of our view of the Arctic.

**Q99 The Chairman:** Excellent. In fact, you have answered part of the first question that I was going to ask which was about the distinction between those three areas, so I will not ask it. That is a very logical way for Statoil to look at the Arctic. We are always reminded not to see the Arctic as one homogenous area. Do other energy companies make those same differentiations, do they see it in the same way?

**Mr Rúni M Hansen:** Let me put it like this. It is very difficult for me to say exactly how they approach the Arctic and what they are doing, but for us as a company, because we are—or at least we have been—a Norwegian company, we take a stepwise approach to the Arctic. It is difficult for me to answer for the rest of the industry, but of course some other companies have been in the Arctic for many years and know the Arctic environment and circumstances. I am sure that they are aware of that, but whether they approach it just exactly as we are doing is hard for me to say.
Q100 Lord Oxburgh: To be a little more specific, would you like to comment on how the Barents Sea fits into the Statoil future strategy?

Mr Rúni M Hansen: The Barents Sea is a core area for Statoil. We have been there for many years. Let me give an example. We were drilling at the beginning of the 1980s in the Barents Sea and we made a gas discovery, Snøhvit. The first discovery there was in 1982 and it came on stream in 2007, so we used to say that our approach was not a sprint but a marathon. So we already have production in the Arctic in the Barents Sea. In some ways, we can say that the Barents Sea is the gateway to the Arctic for Statoil. There is no doubt that that is an area of focus for us. We have been there for many years. We have been drilling more than 100 wells in the Barents Sea. That is part of our stepwise approach to the Arctic: starting with the Barents Sea, the easiest one.

Q101 Lord Soley: Can you tell us a little more about the technological problems developing the Skrugard field and how much they go beyond the norm?

Mr Rúni M Hansen: The Skrugard field was discovered three years ago, so we have not started development yet or made a decision on development. The Snøhvit field, which we started in 2007 and which is on stream, is a gas field about 140 kilometres north-west of Hammerfest, and everything comes onshore there to the plant. With the Skrugard field, we made a big oil discovery there and we have not made a final decision whether to develop it yet.

Lord Soley: Is that because you are unsure of the reserves there; is it because of the technological difficulties of doing it; or is it for environmental reasons and problems?

The Chairman: Or just that the world price of everything has dropped?

Mr Rúni M Hansen: Yes, exactly. It is very much like that. We are trying to prove even more resources there. That is the reason that we have had a drilling campaign there recently: to
prove that there are even more resources. It is more that, to say it very simply, big costs require big resources or big volumes. That is very important for us. If you know about the politics around these things, there has been a little bit of discussion around the Skrugard development, so it is also something to do with the commerciality around the field but, technologically speaking, it is the same as many other fields in Norway.

Q102 Lord Addington: What scope has there been for co-operation with Russia and other international partners within the Norwegian sectors of the Barents Sea? What scope is there for international co-operation with Russia and Russian companies and others within Norway’s territorial waters? How much have you co-operated there?

Mr Rúni M Hansen: We have co-operation with many oil companies in the region. We are the biggest and strongest one here in Norway. In all our licences in the Norwegian Sea we have a lot of partners, as well as in the Barents Sea. It is more or less like everywhere else in the world; we reduce risk by having partners and getting knowledge. Our co-operation with international oil partners in Norway is the same as everywhere else in the world. I do not know if I have answered your question.

Lord Addington: The question was really about Russia because it is such a big part of the equation in the Arctic. Are there any particular Russian aspects that come to mind?

Mr Rúni M Hansen: Norway has solved the border with Russia. We made a co-operation agreement with Rosneft around two years ago, so we help them to find wells in the Okhotsk Sea and one well in 20 or 21 in the north Barents Sea. We have had close co-operation with Rosneft during that agreement.

Lord Addington: So you are effectively saying that it is normalised?

Mr Rúni M Hansen: Yes.
The Chairman: I suspect that if we have time later we will come on to some of the current political and sanctions issues around that, but we will leave that for the moment.

Q103 Viscount Hanworth: Some people might see a contradiction between the heightened environmental consciousness of the Norwegians and the fact that one of their main sources of wealth is from fossil fuels that are largely responsible for global warming. Is Statoil concerned about local and international environmental opposition to its drilling in the waters of Lofoten and perhaps further north in the Barents Sea? Do you have any great concerns or consciousness of such opposition?

Mr Rúni M Hansen: We are very conscious of this issue. As we were saying at the beginning, our company’s footprint for the oil and gas industry is probably one of the lowest in the world.

Lord Oxburgh: Sorry, how do you define “footprint”?

Mr Rúni M Hansen: Exactly. We have been discussing that. However, if you look at the Norwegian requirements, they are very high compared with many other parts of the world when you look at operations, HSE standards, rig standards and so on. Those standards are very high in Norway compared to many other parts of the world. We are very aware of the things that you mentioned and, as I said, we will not go faster than technology allows us to. We are not going to take a bigger risk in the Barents Sea than we take in the southern part of Norway. That is quite obvious to us and is something that has our highest focus because there is no room for error in the Arctic for us as a company.

Viscount Hanworth: Can you boast of a good safety record?

Mr Rúni M Hansen: Yes, fortunately. That is still our highest priority in the Arctic.

Q104 Lord Soley: Do you do any work on alternative energy sources? Are you involved in green energy at all?
Mr Rúni M Hansen: Yes, we have a focus on green energy. Actually, in the UK our focus is very much on offshore windmills. We are in Scotland now—we have just made a decision to build there—and offshore from the UK.

Lord Oxburgh: Offshore in East Anglia.

Mr Rúni M Hansen: Exactly.

Lord Soley: The evidence that we were given this morning on climate change, which is something that we know about but it is always very stark to see it, shows that there has to be some limit on the use of fossil fuels at the end of the day. Do you take that on board or do you think that it is always going to be fossil fuels?

Mr Rúni M Hansen: If you look at the scenario for the two-degree UN goal, we can see that even in our scenario in the future in 2040 we still see a need for fossil fuels. Even though fossil fuels will still be a lesser part of the energy mix, there will still be demand for energy, not least because of development in the rest of the world.

Lord Soley: So is your company worried about climate change?

Mr Rúni M Hansen: Yes, our policies are very much focused on climate change.

Viscount Hanworth: Do you believe that in the end Norway will have to depend upon nuclear fuel? If so, would you wish to participate in such an enterprise?

Mr Rúni M Hansen: Oh, that is a very big question, and I will avoid answering it if I can. It is difficult for me to say.

Q105 The Chairman: Let us move on. I am interested in your comment that Statoil operates primarily but not exclusively within a Norwegian jurisdiction and you have very high standards, as indeed does Norway itself. In the Arctic, does the regulatory framework vary a lot between the five Arctic Council littoral states? If I could follow up on that, with regard to the disaster side, we in the UK are particularly aware of Deep Horizon and the BP issue.
Obviously there was desperate corporate damage there in terms of reputation and environmental problems, and a whole question mark over marine exploration or drilling. Why should it be any different here from down there? This comes back to the point that Norway might be great in terms of its regulation, but is that also reflected around the polar circle?

**Mr Rúni M Hansen:** Let me answer like this: in our daily work, especially in Norway, there are high requirements. Our internal requirements very much accord with that; indeed, they are probably higher than the external legislation. That means that we do not compromise when we go outside Norway, which we do—we have made big discoveries in Canada and other places. We are not going to make any compromises with our internal requirements, which are also to the Norwegian standard. That is quite important for us. We are not going to say, “Now we’re in a different country…” We will have the same internal requirements wheresover we are in the world.

**The Chairman:** Okay, but given that not everyone might have the same level of standards in the oil industry and there are issues elsewhere, I come back again to the regulatory regimes elsewhere in the Arctic. Are they as high as the Norwegian ones?

**Mr Rúni M Hansen:** There are different requirements, but most of them in the Arctic are quite high. Or even all of them. You can see Greenland—

**Q106 Viscount Hanworth:** Could you possibly lose a partnership with another company in consequence of your higher requirements for regulation and safety?

**Mr Rúni M Hansen:** Could we lose a partnership? Yes.

**Viscount Hanworth:** Has it happened?
Mr Rúni M Hansen: We would not go on compromising. We are always in partnership when we drill wells but we will not compromise our internal requirements at all in our industry. We need to stick to our internal requirements when we drill or do seismic—

Viscount Hanworth: Have you ever ceased a partnership as a consequence of your concerns about the safety of the enterprise and its environmental safety?

Lord Oxburgh: It does not work that way.

Viscount Hanworth: I know; that is why I am putting the question.

The Chairman: I think that Stephen already asked you this question, but has Statoil itself ever had an oil spill on the continental shelf at all?

Mr Rúni M Hansen: No. Erik, you can correct me.

Mr Erik Haaland: Yes, I probably will. I can take that question. We have had spills but never one that has reached shore. We have had nothing even resembling the scale that you saw with Deep Horizon; they have been fairly minor. There have been a couple over a 45-year period on the NCS, but nothing has ever reached shore.

The Chairman: How long ago was that?

Mr Erik Haaland: The last one was about five or six years ago, I believe, at Statfjord.

Viscount Hanworth: Can you tell us where?

Mr Erik Haaland: It was the Statfjord field on the southern part of the Norwegian continental shelf.

Viscount Hanworth: So it should be an easy place to drill.

Mr Erik Haaland: This was not during drilling. It was a faulty loading buoy that led to the spill.

Q107 Lord Oxburgh: As you are probably aware, most of our group are not familiar with the way that the industry actually works, but would you like to tell us a bit about your joint
ventures in the Norwegian sector? Do you operate significantly alone, or is it almost exclusively with JVs with other companies?

Mr Rúni M Hansen: I do not think we are drilling any wells in Norway with 100% ownership. That means that we have licences where there are other oil companies as well.

Lord Oxburgh: In terms of the way it has to go, someone has to actually run the drilling operation. Sometimes that is the responsibility of one company and sometimes a special purpose vehicle is set up to do that. How many of these are you actually operating?

Mr Rúni M Hansen: If you are asking about Norway, I do not have the percentages, but we are the operators in by far the most. However, we are also partners in some cases. We made a discovery at Wisting in the Barents Sea where OMV is the operator, and we are going on stream with the Goliath oil field in the Barents Sea where Eni is the operator and we are the partner. For most of them, though, we are the operator.

Lord Oxburgh: To elaborate on something that was said earlier, would you agree that in fact you and most of the big companies operate around the world to the very highest standards that anyone sets and you do not lower standards in a place that does not have such a rigorous regulatory regime? Would that be fair?

Mr Rúni M Hansen: I can only reply on behalf of Statoil, but that is a fair statement. We will not compromise. It is very much about a mindset in our company; there is no room for error. We do not want to compromise on these things at all. That is very clear to the whole company.

Lord Oxburgh: Can you give us any feeling for the range of companies with which you have JVs in the Norwegian sector?

Mr Rúni M Hansen: Most of the biggest companies in the world—certainly all the well known companies, such as BP, Shell, Exxon and Chevron.
Q108 Viscount Hanworth: I believe that you also had joint ventures with the Russians in the Russian sector, some of which have not borne fruit. Can you tell us a little bit about that and about the difficulty of operating in those conditions?

Mr Rúni M Hansen: Let us say that, in the Russian sector for offshore, we are talking about the Okhotsk Sea and the Barents Sea—we do not expect to drill in the Barents Sea until 2020 or 2021 in the Russian part of it, where we have a joint venture. We will just be shooting some seismics there. So far it has just been shooting seismics; we have not been drilling anywhere offshore.

Viscount Hanworth: Another question that I have to ask you is whether there were any ambitions to take it further in the first instance and whether those ambitions have been forgone.

Mr Rúni M Hansen: Our agreement is that we are going to drill wells in this offshore area off Russia in future.

Q109 The Chairman: I know that you are not part of the EU, but Norway has gone along with the EU sanctions so far. What difference have they made to the investment feel or even the legal context around investment in resources in the Russian Arctic?

Mr Rúni M Hansen: The world is changing all the time in its geopolitics. We will stick to our agreement and also with this sanction, where we are a part of it, we will stick to that.

The Chairman: But have the sanctions so far made it more complicated, given where you are at the moment?

Mr Rúni M Hansen: At least the external environment has changed for us.

The Chairman: Lord Oxburgh, you had a bit more about the UK involvement.

Lord Oxburgh: We have talked about the joint ventures and range of companies involved. It is all markets.
Mr Rúni M Hansen: With all the companies, such as BP and all of them, we have close co-operation—and very close co-operation with Shell, too.

Mr Erik Haaland: And smaller companies such as Cairn and Tullow.

Q110 The Chairman: The emphasis of the question that we are interested in is whether UK business and industry is taking enough of an interest in this area. Is it getting involved as much as it should? Is British industry being proactive enough? Is it getting noticed, or is it not really paying the Arctic enough attention?

Mr Rúni M Hansen: BP is quite active and technologically focused, but of course they have not been very visible in the Arctic lately. With British subcontractors, we are very much involved in the UK now; in Aberdeen we have just opened a big office, because of the Mariner and Bressay fields, which we are going to develop. In the UK, we are mostly using UK contractors. As we can see, there are many UK companies in this industry; it is very difficult for me to say whether they are more aggressive than American or German ones. But our focus on the UK has become very high because of our development in Aberdeen now and because of our offshore windmills in the west of Shetland.

Viscount Hanworth: But we are asking another question—not your engagement with the UK, but vice versa. That is the issue, really. Are we providing services to you significantly, and what is the future prospect for UK industry?

Mr Rúni M Hansen: I have to say that when we talk about Aberdeen base—we had a discussion last week about the development of oil fields in the UK now, on which we are making a big decision—UK contractors will be very active there.

Viscount Hanworth: But what about here?

Mr Rúni M Hansen: They are still here, but I do not have the numbers of the distribution.
Mr Erik Haaland: A fair point that you can make is that the tougher areas of the Arctic require specific technologies and competence, which take years to build up, and some companies have that and some do not. If companies want to compete, they have to have that specialised competence or technology, and if UK companies do they will of course be able to do that.

The Chairman: You are saying at the moment that they are not really up to scratch.

Mr Erik Haaland: Probably less so than the littoral Arctic nations.

Lord Soley: What about subsea platforms and subsea work, where I thought some of the Aberdeen and other companies were rather advanced. Is that right?

Mr Erik Haaland: Absolutely. The whole UK and Norwegian continental shelf has been a great technology success story. It has been brought northwards; we take with us the technology that has been built to deal with the harsh environments in the North Sea. That is from UK and Norwegian suppliers.

Q111 Lord Addington: Briefly, how much do the changes in oil and gas demand due to the rise of Asia affect Statoil’s decisions to invest in, say, LNG facilities as opposed to pipeline investment in northern Norway?

Mr Rúni M Hansen: We can see that demand for energy is growing, especially in that part of the world, when the developing countries have a higher economic standard. Your question is about how we develop regarding LNG and so on in northern Norway, due to increased demand in Asia.

Lord Addington: Yes, as regards pipeline investment in northern Norway.

Viscount Hanworth: Is there a trade-off? Are you looking in both directions or are you bearing eastwards?
Mr Rúni M Hansen: When we were building the Snøhvit development, that is LNG, the intention was to export it to America. Then you have the shale gas revolution and the market disappears; so now it is going to another part of the world. As for the discussion about the pipeline from Norway to the Barents Sea, that has been a very big one over whether we should have a hub or a pipeline.

Viscount Hanworth: So the hub would be located offshore.

Mr Rúni M Hansen: Yes.

Mr Erik Haaland: That is for oil, but I think that the reference is to a trade-off between building a pipeline all the way to the Barents Sea versus LNG. That is a resource issue; if you discover the resources, you will have to have that debate.

Q112 Lord Addington: But also with the rise of demand from a new sector, how far can you go? How far have you developed ideas there and how far will that change where you are looking? Are you looking to invest further east or in shipping facilities further east?

Mr Erik Haaland: One of the elements for our portfolio is that we have made some very large gas discoveries in eastern Africa, in Tanzania, which is of course closer to the Asian market than is northern Norway. That is being developed as an LNG project.

Lord Addington: So you have gone global and we are still looking up here.

Mr Rúni M Hansen: Yes. We have definitely gone global. We have made very big discoveries for some years in Tanzania. The Barents Sea is one part of our portfolio, but not everything.

Viscount Hanworth: Are you looking any further south than Tanzania?

Mr Rúni M Hansen: In Mozambique also.

The Chairman: I think that we will keep off equatorial Africa. That will have to be next year’s Committee!

Viscount Hanworth: I have a particular vested interest.
Q113 The Chairman: Can I just come back to shale gas and unconventional oil, which has made a lot more reserves technically available for gas and completely changed the world market? Has that effectively, in terms of your stretch and third tier Arctic, meant that you will put it off for 30 years? Has it effectively closed down a lot of development potential in these difficult areas?

Mr Rûni M Hansen: Again, the external environment is changing all the time and it is affecting our view of the world. We have a global portfolio and, when we are looking at that portfolio and at the ones that are most economically viable, with the lowest break-even price, or however you define it, if you are getting competition or if you are in a sector with a lower cost, it is most likely that we are going to develop that. So all these things affect our view of the world. We have a lot of experience in the workable Arctic today and we produce resources from the workable Arctic in competition with the rest of the world. For some of the extreme Arctic we are far away from producing anything, because we need to develop technology and to drive costs down. So it is an influence, but all the time there are different scenarios. It depends very much on the development of the different areas in the world.

Q114 The Chairman: I do not want to overemphasise the spill that you had, but I am trying to use it as an example. I am not trying to make too much of it because, clearly, you have an excellent track record in comparison with others. What lessons were learnt from that and how was that integrated back into your management of these things?

Mr Erik Haaland: That is one of the main things that we do. You see that in the airline industry and all large industries—taking lessons from incidents that you have and improving competence in people, as well as improving technology, how you survey and maintain things. In this specific incident, that led to a change of technology being used to ensure that it would not happen again.
The Chairman: The airline industry shares all that experience. Do you do that in this industry?

Mr Erik Haaland: Very much so. Safety is not a competitive advantage; it is something that you share. That goes for oil spill response and incidents. There are systems for sharing incidents and how you dealt with them.

Q115 The Chairman: We have two minutes left. I cannot resist asking one question that is not completely to do with the Arctic. If you take an investment decision in Aberdeen, which could be a state outside Europe, the United Kingdom and NATO, does that make you nervous?

Lord Addington: This will be published after the referendum!

Mr Rúni M Hansen: I am from a small society, from the Faroe Islands. When you talk about independence you can talk about the Faroe Islands and Denmark. That is the reason why I do not want to answer your question! When all these big companies and multinationals tell people that they should not do something, the experience is that they will do just the opposite. So it would be very stupid of us as a company to tell the Scottish people anything about whether they should vote yes or no. We will say that, whatever the outcome, we hope to stick to the issue. It would not be very wise of us to put our fingers into these matters. If we as a big company were to recommend something, I am sure that people would do just the opposite.

Lord Soley: It is the heart versus the head.

Mr Rúni M Hansen: Exactly. So you must not quote me for an answer. What should I say about it? We are following it very closely. We are just starting in Scotland.

Lord Soley: The economic consequences would be serious—we should not have any illusions about it—but I understand what you are saying.
The Chairman: That is a very wise answer. Thank you very much. It has been very useful. We were very keen to speak to someone from the industry.

Mr Rúni M Hansen: It was very nice to meet you. I hope that you got something out of it.
Professor Philip Steinberg, Professor Robin Churchill and Professor Maurice Mendelson QC – Oral evidence (QQ 50 – 62)

Professor Philip Steinberg, Professor Robin Churchill and Professor Maurice Mendelson QC – Oral evidence (QQ 50 – 62)

Transcript to be found under Professor Robin Churchill
1. What are the main issues arising from recent and expected changes in the Arctic region? How will these changes impact upon the Arctic and what is the impact for the UK?

1.1. Melting sea ice will allow the expansion of Arctic transit traffic and UK ports should be ready to benefit from this.

1.2. The extent of the summer sea ice in the Arctic Ocean has decreased by about 40% on average since 1979, when satellite measurements started. The decrease in winter is about 8% in comparison.

1.3. Reduction in summer sea ice will expand the navigable area and extend the season. Both the Northwest Passage and the Central Arctic Ocean route could become navigable under summer conditions by mid-century or even earlier.

1.4. For transit between ports in northern Asia and Northern Europe, the distances through the Arctic are shorter than via the Suez Canal. Nevertheless, it should be borne in mind, that speed is reduced in ice so savings in distance may not deliver the same in time savings. Sailing times may also depend on regulatory approvals.

1.5. If however potential cost savings related to shorter shipping routes are achieved then this will contribute to lower logistics costs for the European economy.

1.6. In our opinion, the UK needs to begin the process of assessing the part that UK ports can play in achieving this. In a previous hearing mention was made of the potential strategic importance of Hull as a port of entry for shipping from northern Asia arriving into the EU via the Arctic. The Humber ports of Hull and Immingham are well placed to benefit from this potential traffic and this would also link with the putative project to create a logistics hub in the Humber/South Yorkshire sub-regions which aims to encourage a move from long distance road haulage to sustainable methods such as rail, short sea shipping and river and canal transportation.

1.7. Recommendation

Conference (jointly with European Commission) located in Hull bringing together Arctic maritime specials, oceanographers, climatologists, shipping companies, port companies and others to assess the feasibility of the Humber ports acting as the main point of entry into the EU for shipping from northern Asia via the Arctic.

2. How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure the correct balance is found and maintained? How should the UK be involved in establishing this balance?

2.1. It is clear that the resilience of Arctic ecosystems to withstand diverse events such as ship accidents or incidents during offshore drilling activities is weak. While particular risk events such as an oil spill are not necessarily more likely in the arctic than in other extreme environments the potential environmental consequences and costs of clean up may be significantly greater.

2.2. Recommendations

The highest possible international standards should be used by oil and gas companies as well as by shipping companies in the Arctic. The UK government should insist that UK companies operating in the Arctic should not only employ those high standards but should be at the vanguard of discussions as to how those standards need to be supplemented for Arctic challenges.

The risks in the Arctic, both environmental and societal, call for new business models. International cooperation, both political and financial, is crucial in achieving this. Therefore,
an international finance institution or financing framework should be established in the City of London to provide loans and make capital investments and which would include an emphasis on environmental and social responsibility in Arctic hydrocarbon-related projects.

3. How effectively does the UK interact with Arctic governance structures? Is the UK government’s approach, as set out in the Arctic Policy Framework, proportionate and appropriate?

3.1 The UK (and other EU member states) is affected in the Arctic through changing climate, the opening of sea routes, fishing migration, energy supply, tourism and so on. It is only reasonable that the UK expresses its interests in the Arctic through its Arctic Policy Framework in the same way EU’s strategic approach to the region as first expressed Arctic Strategy of 2008.

3.2 The European Commission has been asked by the Council to draw up a renewed Arctic Strategy by the end of 2015. In our opinion, it is important that this document accentuates the EU’s leadership role across a number of horizontal policy areas particularly environmental, fisheries, transport, energy and tourism. In this way, the EU can focus on those areas where it can make a positive difference and also, as importantly, advance its image in the region.

3.3 Recommendation

That the UK plays a central role in the drawing up of the EU’s 2015 Arctic Strategy, in particular, supporting the EU’s focus on those areas where it can make a difference and thus shifting the strategy away from its current foreign policy and international relations base and towards more practical outcomes in the areas of environmental, maritime, energy, trade and other concerns.

September 2014
Sovcomflot Overseas Holding Ltd, Fednav and Lloyds Register – Oral evidence (QQ 131 – 141)

Transcript to be found under Fednav
Autonomous investigations of the Arctic’s response to changing climate

[1] Major scientific challenges can often lead to rapid advancement of technologies that are subsequently routinely adopted by industry and civil society. Understanding the response of the Arctic to climate change and other anthropogenic influences is difficult because of the region’s vast size, remoteness, partial ice cover, deep waters, complex bathymetry, seasonality, and inhospitable conditions. Traditional approaches using human observers, ships, aircraft, submarines, and satellites are expensive, often dangerous, and only provide limited spatial and temporal coverage. Robust, compact environmental sensors coupled with intelligent autonomous platforms could provide, at much lower costs, vastly improved observations of the Arctic and hitherto unavailable information of other hostile environments.

[2] The Arctic both influences and is highly sensitive to, global climate change, as illustrated by the recent rapid decrease in Arctic summer sea-ice cover. Changing Arctic conditions are having unquantified effects on ocean circulation, biogeochemistry (e.g., ocean acidification), and marine ecosystems and biodiversity. Changes in the Arctic region are thought to be a precursor of rapid global climate change. The stability of continental ice sheets such as on Greenland is strongly dependent on the submarine grounding of the ice shelves around their marine fringes. Loss of these protective ice shelves could result in the collapse of the continental ice sheet and rapid, major sealevel rise (>1 m/century, total rise 6-7 m; e.g., Grant et al., 2014, Nature Comms., 5:5076; doi:10.1038/ncomms6076). Climate change and reduced ice cover may open shorter, more efficient shipping routes and access to new energy resources but the exploitation of these opportunities could devastate highly sensitive Arctic environments, with global consequences (e.g., dissociation of permafrost-hosted methane hydrates due to sealevel rise).

[3] Earth, ocean, atmospheric, environmental, and polar sciences have traditionally relied on an “expedition” mode of operation, where small regions of the Earth are observed at spatial and temporal frequencies far greater than those at which the systems themselves are changing. Although satellites provide more extensive and near continuous coverage of the atmosphere and sea-surface for some parameters, the deep oceans, regions beneath ice, and Earth’s subsurface remain poorly accessed and severely under-sampled. The combination of low-density spatial and temporal data is a major challenge to our understanding of natural processes and the impacts of anthropogenic activities that can have global impacts. Meeting these challenges requires sensor systems that are rugged, can be deployed in large numbers, and have a degree of autonomy that enables them to function in extreme environments. Such sensor systems are now nearer realisation through new physical, chemical and biological sensor concepts and advances in bespoke design and
manufacture (e.g., 3-D printing), advanced materials, miniaturisation and micro-fabrication, microfluidics, and sensor robustness and calibration.

[4] The effective utilisation of these new sensor technologies requires the ability to project their observing capabilities into remote, hostile, dangerous, and highly variable regions. This requires the integration of new sensors with fixed (e.g., ocean observatories, down boreholes, or mounted in ice sheets) and mobile platforms such as aerial, surface (terrestrial or ice), surface marine, and submarine vehicles that can be rapidly and cheaply deployed. These platforms include rotary and fixed wing unmanned aerial vehicles and gliders, wave riders, submarine floats, gliders, and autonomous underwater vehicles. The recent loss of Malaysian Airlines MH370 (8th March, 2014; 239 passengers and crew) and the inability to locate the aircraft has illuminated the vast scale and unexplored nature of large parts of our planet, and that although we have nascent autonomous technical abilities, these are still developmental, few in number, and are costly in terms of ships and personnel. Effective deployment of autonomous platforms requires major advancements in their endurance, battery technology, energy usage, storage and harvesting, precision of navigation, communications with operators and between vehicles, data storage, processing and transmission, and command, control, onboard decision making and adaptive mission behaviour. Sensors and their autonomous platforms will need to be cheaply produced, expendable with low environmental impact, and able to be rapidly deployed en masse from ships, aircraft, rockets and balloons. Importantly it is essential for a small number of human operators to be able to control fleets of vehicles and sensor platforms.

[5] The data streams from these sensor systems will revolutionise the environmental sciences and our ability to interact with, and manage, the Earth’s environment including polar regions. However, these data streams will be vast, and this will require major advances in artificial intelligence, machine learning, information processing, image analysis and visualisation, and the development of new generations of environmental scientists and engineers who can devise, design and construct sensor systems that operate under control or autonomously for deployment in routine, remote, extreme or hazardous environments, and analyse and interpret the large datasets and image portfolios. Together these advances will include aspects of at least five of the Willetts’ Eight Great Technologies (Robotics and Autonomy, Energy Storage, Advanced Materials, Space, Big Data). New national and international legal and regulatory frameworks will need to be developed to enable the responsible deployment of these autonomous technologies.

[6] Major scientific challenges are important drivers for the advancement of nascent technologies. Despite the importance and sensitivity of polar regions to global climate, our knowledge of the role of the Arctic and the effects of climate change on the Arctic remain curtailed by its remote, inhospitable, and partially ice-covered nature. New technologies have the potential to revolutionise the environmental sciences by providing 4-dimensional information on air and water masses, biogeochemical cycles (e.g., carbon, nutrients), and ecosystems, and enable observations to be made in previously inaccessible regions. The scientific and technical challenges posed by designing components and systems able to survive and function in the extreme environments encountered in environmental sampling are strong drivers for the development of new technologies that may be routinely used by industry, defence, and civil society (“The Science Dividend”). Such improvements will provide major benefits for science but also for many industrial sectors that require long term monitoring and remote or hazardous area operations (e.g., flooding, landfills, transport systems, nuclear infrastructure, pollution monitoring, oil spills, carbon storage reservoirs,
boreholes, seismically active, volcanic and geothermal regions, national security). Advanced technologies are often useful mechanisms for improving awareness of, and engaging the public in, complex environmental issues. Autonomous vehicles, robotics and hostile environments provide great inspiration for numerate school children to continue in science and technology fields and to attract graduate physical scientists and engineers into environmental research.

[7] The environmental challenges of the Arctic will require sustained international scientific collaboration by members of the Arctic Council and other nations with advanced technologies. UK universities, research organisations (e.g., National Oceanography Centre, British Antarctic Survey), and small and large industries have cutting-edge technologies and world-leading expertise in sensor development and autonomous platforms, and experience in their successful deployment in challenging environments. Maintaining UK leadership in the development of these new technologies and their deployment for Polar and environmental research will require improved collaboration between the Department for Business, Innovation and Skills, Research Councils UK (in particular the Natural Environment Research Council and the Engineering and Physical Sciences Research Council), Innovate UK, the Department of Energy and Climate Change, and the Foreign and Commonwealth Office.

[8] With support from the BIS Global Partnership Fund, the Great Britain Sasakawa Foundation, the University of Southampton and the Natural Environment Research Council, the British Embassy in Tokyo will host a workshop for UK scientists and engineers and Japanese colleagues (Japan Agency for Marine-Earth Science and Technology (JAMSTEC), National Polar Research Institute, Japan Space Agency, Atmosphere & Ocean Research Institute and the Institute of Industrial Science, University of Tokyo) to define specific science challenges and develop an action plan of technical developments required to improve our observations and understanding of the Arctic’s response to climate change and anthropogenic activities. Future delivery of this plan will require national and international collaboration between funding agencies.

[9] Improved observations (e.g., currents, bathymetry, ice volumes, dissolved CO₂, biodiversity, environmental baselines) and better understanding of key processes in the Arctic (e.g., ocean circulation, ocean acidification, sensitivity of eco-systems, stability of continental margins) are essential for policy makers and businesses to make informed decisions and investments. Presently much of the required data and measurements can not even be collected because we lack approaches to make sustained observations in remote, hazardous locations such as beneath the Arctic ice sheet or along the fringing ice shelves of Greenland. The UK has world leading expertise in environmental science and the development of autonomous systems and sensors required to address this data gap. There is a growing small business sector, closely linked to Universities and Research Organisations, which can bring to the broader industrial market, monitoring and observing instruments, systems, and approaches that were initially developed to tackle the major environmental challenges presented by the Arctic.

*September 2014*
Dr. Aki Tonami – Written evidence (ARC0008)

Dr. Aki Tonami, Researcher, Nordic Institute of Asian Studies, Department of Political Science, University of Copenhagen

In response to the Committee’s questions no.7 and no.8, I believe it is useful for the UK Government to be informed on the Arctic policy of Japan, one of the Asian states that became a new Permanent Observer of the Arctic Council. You will find my recent article on Japan’s interests in the Arctic, titled “Future-Proofing Japan’s Interests in the Arctic: Scientific Collaboration and a Search for Balance” at: http://nbr.org/publications/element.aspx?id=765

The main points presented in the article are:

1. Japan is no newcomer to the Arctic. This is backed by its long history of engagement in the Polar Region, both Arctic and Antarctic. The country’s primary aim of engagement in the Arctic is to understand and protect the natural environment. However, a strong, influential shipping industry lobbies the government to ensure that scientific knowledge is used to bring economic benefit to the Japanese economy, for instance through the use and development of the Northern Sea Route (NSR).

2. Japan views the Arctic Council as an appropriate forum to participate in discussions on Arctic governance. It did not see the need to discuss security problems, which are not dealt with at the Arctic Council, at the time of application. However, with the changing geopolitical/security situation, particularly with Russia, Japan may begin to perceive the limitations of the Arctic Council.

3. Japan sees scientific research as what it does best as a technologically advanced industrial nation and this is what the Arctic Council expects it to do. Japan also seeks opportunities/partners for cooperation to better contribute to Arctic governance and Arctic science.

4. In choosing an Arctic partner, Japan was forced to choose between Russia and the United States. Until the Ukraine crisis it appeared that Japan leaned more toward Russia than the US for political and economic reasons. The Ukraine crisis and the subsequent hardening of attitude of Russia have made Japan’s cooperation in business development in the Russian Arctic difficult.

Drawing from this, the points that are of relevance for the United Kingdom are:

1. It would be useful for the UK Government to study the possible options of effectively using science and technology as a diplomatic tool to gain more influence in the existing and (possibly) future Arctic governance structures. Japan views science as the key for it to gain more presence in Antarctic governance and would like to replicate this experience in the Arctic to a certain degree.
2. In doing so, furthering scientific cooperation with Japan and its research institutes formally and informally would be of great advantage. Japan is a democratic, well-established industrial nation, has a long, established history of Polar research, and is a like-minded country of the United Kingdom, above all respecting the rule of law. China has established a China-Nordic Arctic Research Center in Shanghai with various Nordic Arctic stakeholders, however so far its political merit has exceeded its scientific research results. The UK could consider setting up a similar forum with countries such as Japan to engage political, business and scientific communities on the Arctic, or play a more active role in existing forums such as IASC with this in mind. Japan already has made bilateral agreements with Canada and Germany to prioritize Arctic research, and the United Kingdom might consider something similar.

3. Japan respects the rule of law and signalling this to the international community is a diplomatic objective of Japan as an island, maritime nation with more than a few territorial disputes. Japan understands the significance of securing Japanese personnel at relevant international organisations, such as the International Maritime Organisation and International Tribunal for the Law of the Sea. In this regard, some aspects of Japan are very similar to those of the United Kingdom. This would help create a sense of solidarity between the two countries when discussing possible areas of furthering cooperation.

*August 2014*
1. Since the beginning of 2000's the Arctic has evolved to become a new strategic action area of global affairs. Although there remain some unresolved border disputes, namely in the Beaufort Sea, over Hans island and in the central Arctic basin, it is safe to say that the future development of the region will follow a peaceful trajectory. Harsh environmental conditions and abundance of natural and logistical resources create favorable conditions for cooperation between circumpolar and non-regional countries in the Arctic.

2. Development of the Arctic region unveils a whole range of opportunities for the British economy and businesses.

3. Firstly, Norwegian and Russian parts of the Arctic could be of great significance for the UK as a potential hydrocarbon province, which can eventually substitute depleting oil & gas resources of the North Sea.

4. Secondly, the necessary prerequisite for a full-scale and responsible development of the Arctic shelf deposits is the availability of a wide range of cutting-edge technologies and equipment, tailored for hydrocarbons exploration and production in harsh environment conditions. Many British companies - not only major offshore operators like BP and Shell, but also engineering enterprises, like Rolls-Royce, Subsea7, Converteam, Precision Polymer Engineering, e.t.c. - have valuable experience in this field. So there are good reasons to claim that Arctic technological expertise of the British industry will be in-demand asset during the implementation of Arctic offshore projects, as already confirmed by the regional experience of Sea Drill Offshore, Rolls-Royce and Tullow Oil.

5. Thirdly, if in the long term, Europe-Asia trade turnover increases substantially, it can inspire the UK to take a closer look at Arctic shipping opportunities, namely the Northern Sea Route (NSR), which provides the shortest distance between British and East Asian ports. A pioneering voyage of „Beluga Group“ vessels in 2009 triggered the demand for Arctic transit. Due to the involvement of the international shipping community the NSR transit cargo turnover reached a record level of 1.2 million tonnes in 2013. However, in spite of all optimistic claims and statements, made by President V. Putin and other senior Russian officials, still much preparatory work should be done until the NSR potential becomes attractive enough for foreign stakeholders. So far UK cargo owners and shipping companies prefer to stay aside from „Arctic euphoria“ because of the NSR unpreparedness for regular shipments213 of containerized cargo, which dominates in the structure of British export, and comparatively high level of icebreaking fees.

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213 Arctic is navigable only 4-5 months a year

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a Lecturer at the School of International Relations, St. Petersburg State University (Russia).
b Expert in Arctic Affairs at the Russian International Affairs Council.

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6. If the Northern Sea Route transit development still follows a favorable scenario, Lloyd's of London can take advantage of this trend and emerge as one of the leading financial organizations, providing maritime insurance for sailings in the Arctic. The level of maritime insurance rates, fixed by Lloyd's, would be one of the key factors, determining economic efficiency of Arctic shipping in general. Another strong asset, which could serve as an additional pillar of the UK presence in the Arctic is the outstanding excellence Lloyd's Register in the sphere of ice technologies research and ice classification of ships.

7. While pursuing a balance between economic benefits and environmental protection considerations, we should proceed from the premise that development of Arctic ocean resources is inevitable. Readiness of stakeholder countries to provide maximum safety of Arctic nature amid increasing industrial activity in the region should be expressed in disposal of sophisticated technologies for environmental emergency response. For example, in the sphere of Arctic oil spill recovery the majority of equipment is currently produced by three European companies: Desmi (Denmark), Lamor (Finland) and Vikoma (UK). Though it should be admitted that existing technological solutions are not enough to provide maximum environmental preparedness in the Arctic. The UK can contribute to further work in this field by establishing environmental engineering cluster(s) in Aberdeen and/or Sullom Voe, which will be dealing with R&D and production of a cutting-edge oil spill response equipment, specifically tailored for Arctic conditions.

8. Since the beginning of 2000's a fairly extensive volume of Arctic-related data has been produced. However, the extracting of relevant information from the bulk of Arctic knowledge turns out to be an uneasy task. On the basis of my professional experience, I would like to suggest several points on how to streamline the information support of the UK Arctic policy decision-making.

- The key condition for success is a simple and reliable methodology. Collection and analysis of information on various Arctic issues should be continuous, comprehensive and comparative. Meeting these three C's can provide the Foreign and Commonwealth Office with the most acute understanding of key interests, capabilities, comparative advantages and disadvantages of stakeholder countries, as well as driving factors of regional development in general.
- Officials and experts, preparing the ground for Arctic policy decisions, should be particularly fastidious and critical about the sources of information in use. Most relevant information on regional issues comes from the first-hand sources, i.e. Arctic strategies, governmental papers, statements and interviews of senior political officials, reports of research organizations, e.t.c. Publications, based on interpretations and commentaries, which are so wide-spread in the mass media, should be treated with caution, though not disregarded.
- Verification of technical data, statistics and other specific information, pertaining to the Arctic development, is absolutely necessary as well.

9. It seems reasonable to establish a special analytical division within the FCO's Polar Regions Unit (PRU) framework. A team of 5-7 highly qualified specialists will be enough to carry out full-fledged information support of the UK Arctic policy decision-making. For purposes of getting valuable current information on various Arctic issues PRU should keep in

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214 (please, refer to Report No. 32 on Joint Industry Program „Oil Spill Contingency for Arctic and ice-covered waters”
close touch with UK diplomatic missions accredited to circumpolar and non-Arctic states. If it is necessary, Polar Regions Unit can also outsource Arctic expertise from relevant research organizations, like Chatham House, London School of Economics and Royal Geographic Society.

10. Generally speaking, the UK’s Government approach to the presence in the Arctic region seems to be balanced and well-thought. Threefold vision, outlined in the Arctic policy framework, sends a positive signal to other stakeholder countries. Working in the IMO and the Arctic Council gives the UK a room for manoeuvre to push for Arctic environmental compliance measures. However, when it comes to promotion of UK commercial interests in energy, shipping, banking and technological spheres, international organisations turn out to be irrelevant. For this purpose, bilateral intergovernmental forums or meetings are much more effective, because they create a platform for direct discussion and promotion of concrete regional projects between senior politicians and business leaders from both sides. Thereby, I would recommend the HM Government to consider opportunity of establishing a UK-Russian forum or commission on Arctic cooperation. Due to the negative impact of the War in Ukraine on diplomatic relations between Russia and the West, further practical elaboration of this idea will become possible only in the long term. But nevertheless the Arctic cooperation has good chances to become a brand new dimension of the UK-Russian agenda, which will cool down mutual controversies and misperceptions as well as open a new space for cooperation.

*August 2014*
Arctic Risks: Outcomes from an Arctic risk scenario meeting

Background

UCL Institute for Risk and Disaster Reduction (IRDR) is a trans-disciplinary research institute that leads research, knowledge exchange with industry and humanitarian agencies, and advanced teaching, in the area of risk and disaster reduction. The Institute’s programme in Arctic Risk has strong links to the UCL Centre for Polar Observation and Modelling (CPOM), and collaborations with industry, the humanitarian sector and academia, in Canada, Norway and Svalbard, Russia, and Finland.

We believe that the risks associated with Arctic development often involve the overlap of disciplines and sectors. Based on this belief, we organized an Arctic Risk Scenario meeting on the 12th September 2014. Invited participants worked through two Arctic disaster scenarios. The scenarios chosen were: (1) a cruise ship sinking off north east Spitzbergen, and (2) an oil well blowout in the Kara sea. Participants came from the oil and gas industry, shipping, law, politics, humanitarian agencies and academia: one aim of the meeting was to bring together diverse perspectives on the Arctic.

Two invited speakers presented relevant background. Dr Nataly Marchenko (The University Centre in Svalbard (UNIS), and author of the book “Russian Arctic Seas”) discussed a series of recent Arctic shipping near-disasters. Dr Rocky Taylor (C-Core, St John’s, Newfoundland, Canada) discussed the complexities of oil exploration and production in Arctic seas, again based on a number of reference events. The rest of the meeting was held under the Chatham House Rule. Diverse views were expressed, and in this document we highlight topics of broad consensus and areas of disagreement.

This document highlights observations and outcomes from the meeting which may affect the UK’s ongoing interests in Arctic development. Of the questions listed in the call for evidence, this submission is particularly relevant to numbers 1, 3, 5, 7 and 8.

Summary

- The Arctic has very significant commercial potential from mineral extraction, including oil and gas, shipping transport, fisheries, tourism, and forestry, and from the financing, development and deployment of the infrastructure necessary to support these industries.
- The pace of exploitation of the Arctic resources and opportunities is ever-increasing as the Arctic warms at a rate faster than any other region on Earth.
- There is a wide range of very significant risks in development and exploitation of the Arctic, including environmental, social, economic, and political. These risks are complex
University College London, Institute for Risk and Disaster Reduction – Written evidence (ARC0027)

and interact, and their impacts have a range of timescales from immediate, to many decades.

- Some of these risks are illustrated through analysis of two case studies given below; a tourist ship sinking and an oil production blow out. These demonstrate that, whilst significant risk mitigation measures have been developed in recent years, serious issues remain arising from the remoteness, the limited distribution of safety support infrastructure, the extreme environmental conditions, and a lack of key knowledge e.g. how to deal with oil under sea ice. These specific scenarios also highlight broader uncertainties regarding, for example, international cooperation and the regulatory framework in the Arctic.
- The UK has the capability to take advantage of the many opportunities and to contribute significantly to mitigating the risks, but needs to develop a robust, integrated plan (coordinated jointly by Government and business) as a matter of urgency.

1.0 Tourism and Cruise Ships

1.1 To predict the response to an Arctic sinking, we have to know the location and depth of the sinking; the legal jurisdiction and the political groups (government and other) involved; the immediate coastguard availability; and so on. Since the aim of the meeting was to understand dynamics which might occur following any Arctic sinking, we steered away from specific technical details and towards more general principles and trends. Overall, a future Arctic shipping disaster was not thought to be improbable. The Costa Concordia and MV Explorer were considered useful recent reference events. Our invited speaker Nataly Marchenko also discussed other recent crises involving fishing vessels and tankers in the Arctic.

Scenario 1 – An Arctic Cruise Ship Sinks

June 2015: a cruise ship is holed off the north-east of Svalbard by collision with an ice floe. The ship carries 300 passengers, mainly European, but also from East Asia and North America.

The incident occurs at 0300. A mayday signal goes out at 0400. All passengers are evacuated and in lifeboats by 0800. Weather conditions are difficult, and a Norwegian Coastguard vessel reaches the scene at 1000. The ship is completely submerged by 1800.

Dimensions: Human safety, technology, logistics, communications, pollution, wreck removal, jurisdiction and geopolitics, cost and insurance, local and indigenous interests

Responses: Arctic tourism and the media; coastguard; shipping; governmental; public perception of the Arctic; legal; environmental...

Timescales: immediate; same season; the following summer; long-term.

Wildcards: disaster tourism; the wreck is trapped for the winter; loss of communications; and severe regulatory change in Arctic shipping.

1.2 The incident as described had a nearby coastguard vessel which was able to reach the accident site within hours, and no life was lost. Participants felt that this was highly optimistic, since the Arctic has few ports and limited search and rescue facilities. There was
confidence in the ability of the Norwegian authorities to respond. It was noted that Svalbard emergency services are to run a full-scale rescue exercise this winter. There was less certainty about the ship’s crew: would they be trained in Arctic environments? Although the IMO’s Polar Code should in the future take care of this aspect, many crews at the moment come from warm climates. The passenger demographic is likely to skew old, and the passengers and crew may not all share common languages. As well as taking a view of the whole, we must consider that each individual on board will need personal help. Survivability is highly dependent on the precise details of the sinking. Also, the recovery brings its own risks, particularly as coastguard ships and other well-meaning vessels enter an area which is known to be dangerous.

1.3 Norway has an excellent and ever-improving rescue helicopter network. However, accidents are likely to occur when the weather is poor, and so helicopters may be unable to help significantly in the rescue. With the retreating ice edge, ships are moving further away from land (looking for polar bears) and hence the range of each helicopter journey might be large. Further, Svalbard is well-placed for such rescues, but tourist boats may try to traverse the Northern Sea Route, for example, with increasing regularity. Accidents are therefore increasingly likely to occur away from locations where rescue infrastructure is in place and organized.

“Accidents are increasingly likely to occur away from locations where rescue infrastructure is in place and organized.”

1.4 The proposed scenario is, however, most likely to happen near popular tourist destinations (that’s where the ships are). An accident will damage the local tourism industry (there was uncertainty about the extent to which the MV Explorer sinking was responsible for the recent strong downturn in Antarctic tourism.) In places like Svalbard, where tourism is a large part of the economy, this is likely to be the most significant local effect.

1.5 Media management is different in the Arctic, since it will be difficult or impossible to get journalists and photographers to the scene. This (along with general media trends) may lead to an increased reliance on eyewitness accounts and photography. How does this change the filter through which the world sees the event? Costa Concordia and MH370 were raised as evidence that both visibility and uncertainty will tend to keep events in the public eye and on the front pages.

1.6 In the medium term, the flag state of the vessel would produce a report on the incident, and this report would be submitted to the IMO. Some information might be concealed to preserve reputations. Depending on location the wreck might be removed or left. It might become a maritime grave.

1.7 In the scenario discussed, jurisdiction was clear (the Norwegian coastguard would be in charge) but there were still open questions about international cooperation. If the ship is largely populated by, say, American or Chinese tourists, those governments would certainly demand answers. A clear decision-making hierarchy is necessary, both immediately and in pollution control and wreck removal, but such a hierarchy may not be widely agreed
(although immediate operations would be run out of Longyearbyen). Legal and contractual disputes are likely to be drawn out over many years. Every additional step in the recovery and cleanup – for example those discussed in our wildcard scenarios – increases the legal complexity and the difficulty in assessing what actually happened. There are very few precedents in the Arctic, and so insurance rates and actuarial calculations are somewhat speculative.

1.8 In extending the scenario, participants noted that much larger ships (up to 3000 passengers) are now visiting Svalbard. Capacity on coastguard ships would be much less than this, and the consequences could be disastrous. Some doubt was expressed about whether the passengers and crew (perhaps 500 people in total) in the scenario could be accommodated on any ice-class rescue ship. It was suggested that if jurisdictions wish to encourage high capacity cruise ships in their waters, they should be required to invest in adequate SAR capacity to respond to potential events in case of an emergency.

Scenario 2 – An Arctic Blowout

In mid-October 2016 a near-shore Arctic exploration well in the Kara sea experiences a blowout due to an unspecified technical failure during an extreme storm. The well is 1000km from the nearest large port and its well-equipped hospital. There is no immediate loss of life and all workers are evacuated to life vessels. Early estimates suggest the well is leaking around 1000 barrels/day. Ship access to the rig is likely to close in early- to mid-November.

**Dimensions:** human safety, pollution and cleanup, cost and insurance, technology and engineering, jurisdiction and geopolitics, local and indigenous interests

**Responses:** coastguard; technological; shipping; governmental and intergovernmental; media and public perception of the Arctic; legal; environmental...

**Timescales:** immediate; overwinter; spring; long-term.

**Wildcards:** storm drift complicates the rescue; concurrent leaks; takeover of the rig by an engineering NGO; and loss of market confidence in, and public enthusiasm for, Arctic projects.

2.0 Oil and Gas Exploration and Production

2.1 The risk of oil spills is often cited as a reason not to develop in the Arctic. It’s one of Greenpeace’s two pillars for opposing Arctic development (the other is the symbolic importance of preserving a wilderness). Oil spills (by volume) have decreased markedly in the past forty years, largely due to improvements in shipping technology (e.g. double hulls and advanced navigation tools), and storage technology, as well as increased regulation. Wellhead blowouts are sufficiently rare that trends are hard to interpret. However, Macondo/Deepwater Horizon reminds us that accidents are always possible. The Arctic has about 13% of the world’s undiscovered oil reserves and as much as 30% of the world’s
undiscovered natural gas reserves. This is equivalent to several years’ current global production, and we have yet to go one year globally without a notable oil spill. Policies geared towards zero harmful emissions are necessary, but we should also be prepared for spills. In the meeting, some participants made a convincing case that Macondo was an extreme outlier and that several safety measures have since been put in place; others observed that accidents seem to keep happening.

2.2 There are some important reference events which relate to Arctic development. One paper which was highlighted was “Kolskaya and Kulluk: a disaster and a near disaster” (Gudmestad, 2014). In both the Kolskaya and Kulluk incidents, towing a rig in high weather led to unexpected loss of stability. In the Kulluk, Shell was able to get all personnel to safety, while in the Kolskaya 53 people died. One conclusion of the paper is that “the companies’ safety programs must be updated in the case of Arctic operations with an emphasis on the need for patience and an awareness of the costs for Waiting on Weather.” These events serve as a reminder that extreme weather, as often experienced in the Arctic, is a contributor to risk. The mechanics of sea ice are also an important factor in Arctic risk, and this was evidenced by the ice-induced vibration of the Molikpaq and by structural failures in the Bohai sea. The presence of sea ice, and its management, affect disaster management plans as well as risk likelihoods. Seasonal variability further complicates the picture, since structures and vessels which are optimized for ice may not be optimized for open water, and vice versa.

“Extreme weather and the presence of sea ice lead to elevated risk in Arctic oil and gas development”

2.3 Developments in the Bohai sea also highlight some relevant trends. In the 1960s and 1970s, several structures failed. In the 1980s and 1990s, regulation and conservatism led to much stronger designs. However, current demands are leading to the development of more marginal fields, where costs must be minimized to make production economically viable. Will this lead to reduced safety margins? And are similar trends likely to hold in the Arctic? It was noted that research should help to reduce costs without reducing safety.

2.4 The proposed scenario details a substantial well leak which begins during the shoulder season, just before winter, when the well location (in the Kara sea) becomes inaccessible by ship (unless year-round icebreaker support is available). Similar scenarios – of a wellhead blowout which lasts a whole winter – are considered a worst-case. As with the previous scenario, the first priority is human life, and support vessels would be mandatory to evacuate personnel. Sea ice may complicate, for example, the deployment of lifeboats. Once human safety is managed, pollution control becomes necessary. Post-Macondo safety developments include improved blowout preventor systems; a mandatory local capping stack; a mandatory containment system; and the possibility of a rig on standby to drill a relief well. Oil in the environment can then be contained by some combination of mechanical recovery, subsea dispersants, sprayed dispersants and in-situ burn. Currents will affect the fate of the oil, and from north of the Kara Sea the oil might be drawn into the Fram drift. The interaction of oil with sea ice was a key area of uncertainty. Sea ice may trap the oil, reducing its dispersion but making it more difficult to manage, since oil under ice is

“The interaction of oil with sea ice is a key area of uncertainty.”
difficult to remove. The presence of sea ice also makes it extremely difficult to track the oil as it spreads. Typically methods for skimming and burning oil have very low recovery. Added to this, burning oil will produce black carbon in the atmosphere, accelerating melting elsewhere in the Arctic. Monitoring is important, and the oil might be collected during the spring melt. Pollution, and events which pollute, can have a long lifetime: oil is still leaking back to the surface at the **Exxon Valdez** accident site.

2.5 There was some suggestion that local effects may be slight. Local populations in northern Russia tend to onshore herding, as opposed to, say, west Greenland, where an oil spill could be hugely damaging to fishing and sealing. Perhaps, with this lack of local impact, cleanup and rig removal are less urgent.

2.6 The international attendees of the meeting agreed that geopolitics was crucial to understanding the risk of oil spills. Risk management philosophy varies by region. Canada has a strong dialogue between industry, regulation, and academia, and was felt to have a good regulatory regime. In Russia, only Rosneft and Gazprom are allowed to operate. They have tended to collaborate with western companies who have strong Arctic experience. However, sanctions on Russia and fear of reputational damage may lead to European and North American companies withdrawing from the Russian Arctic. To some extent this is already happening, and the void is being filled by, for example, CNBC and PetroVietnam, who have less experience in polar waters. Severe worries were expressed that this is effectively a reduction in Arctic expertise, in the place where most development is occurring. This ties in to a broader question of whether overly strict local regulation simply moves development to less well-regulated regions.

2.7 Again, the control of information is crucial. Traditional media access will be limited, and first-person accounts will be promulgated through social media. Public perception of the incident, and trust in the regulatory regime, will vary internationally, but any hint of a coverup will damn all operations. The outcomes will be uncertain and worst cases will be reported. In discussing the final wildcard it became clear that public relations will heavily influence future development, insurance and regulation.

3.0 **Broader Arctic trends, risks and opportunities**

3.1 Priorities following an Arctic disaster mirror more general priorities. First, the focus is on the immediate safety of people involved in any incident. Once the direct and local human impact is understood and minimized, resources are moved into pollution reduction and control. Environmental risks - waste and spills - are contained and wrecks are removed. The next phase is reputation management, and views of the incident are presented in traditional and social media, corporate explanations, and political messages. The final phase is likely to be a litigative phase, in which blame is assigned and costs are allocated.

3.2 Although these four phases inevitably overlap, the consensus in the meeting was that they represent widely shared priorities: there was no suggestion, for example, that
reputation management might be prioritized over technical management of the direct consequences of an accident.

3.3 Precedents in the Arctic are not always available, and there was a worry that standards and control measures may be implemented on a design-by-disaster basis. Several recent near-misses were discussed, and participants noted that there is always a measure of luck in avoiding a crisis, and a measure of bad luck in accidents. Have we just been lucky so far, and do we have a good system for measuring and understanding this?

3.4 In both scenarios, there was a strong sense that just one major accident may change the public and political will for Arctic development for decades. Even fairly minor incidents may change the regulatory climate such that Arctic projects become economically unviable. An Arctic disaster is in no-one’s interests.

3.5 New International Arctic offshore design codes (e.g. ISO 19906, 2010) use a risk-based design approach to help ensure acceptable target safety levels are achieved in the design of offshore platforms for Arctic conditions (for example achieving comparable safety levels to those the public expects from the airline industry, etc.). The oil and gas industry is highly aware of the financial and reputational risks associated with Arctic development and operators understand very clearly that an oil spill in the Arctic could mean financial ruin for even the largest company. Correspondingly, Western companies have taken very conservative approaches to Arctic development and invested heavily in technology, training and the development of modern risk-based design codes (by comparison, Polar Class rules for Arctic ship design used by the shipping industry still follow a prescriptive philosophy, not a risk-based philosophy as has been adopted by the offshore industry).

3.6 Other risk scenarios could easily be developed: maritime conflict, slow pollution from Siberia, loss of biodiversity, an Arctic aircraft loss, terrorism. Gradual trends may also lead to new risks. For example, there was uncertainty about the effects of increased Arctic traffic and changes in global trade patterns. Onshore, melting permafrost may alter risks and opportunities over the next few decades. All these risks may have interconnections, and researchers were encouraged to keep an open mind.

3.7 One helpful frame was to consider different types of risk: reputational (Exxon Valdez), price (the effects of shale gas on the market), tax, environmental, socioeconomic (mining in Greenland), political (Russia and Ukraine), technological and exploration risk, and so on.

3.8 Arctic development offers important opportunities, both globally and locally. Diversity of energy supply is crucial, and obtaining oil from, say, Saudi Arabia or the Gulf of Mexico is not without complications. Arctic indigenous people are enthusiastic about well-managed development, in which proceeds are shared.

Appendix: participant list
Our thanks to the participants.

*September 2014*
Professor Peter Wadhams, Professor Daniel Feltham, and Professor Andy Shepherd – Oral evidence (QQ 29 – 36)

Professor Peter Wadhams, Professor Daniel Feltham, and Professor Andy Shepherd – Oral evidence (QQ 29 – 36)

Transcript to be found under Professor Daniel Feltham
It occurs to me in thinking over the testimony given on Tuesday that many members of the Committee will have been left with conflicting impressions about how fast the retreat of sea ice is, largely due to Prof Feltham’s statement that models predict that it will be 2050-2080 before the Arctic is ice-free (even in summer) while my own prediction, and that of the overwhelming mass of scientists who actually study the ice, is that an ice-free summer Arctic is imminent.

To do Prof Feltham justice, he did tell me afterwards that he intended to say more about the limitations of models and that they are failing to predict the observed retreat rate, but he didn’t have time because the session was rushed at the end.

The natural response of an inquiring non-specialist (such as the members of the Committee except Lords Hunt and Oxburgh), when confronted with apparently conflicting testimony, is to conclude that disagreements exist among scientists and therefore urgent action on this subject need not be taken until such conflicts are resolved.

My plea is that their Lordships do not take this tempting view. The actual data on sea ice volume in summer, which is shown in some of the supporting material that I sent (notably the Pontifical Academy paper) and which is solidly based on satellite observations (for area) and submarine observations (for thickness), shows that the ice volume is now only 25% of what it was in 1980. There is a continuing rapid downward trend (with occasional rallies), and this indicates a complete loss of ice somewhere between next year and 2020. There is absolutely no possibility of a survival of summer ice into 2050. It is really important that this result is accepted for the purposes of policymaking, because

a. It determines the dates at which the Northern Sea Route and Northwest Passage become routinely open, plus a possible full transpolar shipping route
b. It determines how the distribution of sea ice affects the spread of oil from possible under-ice blowouts
c. The albedo feedback from this additional loss of ice will accelerate global warming.

But most important of all is the fact that a retreat of the sea ice from the wide shallow continental shelves of the Arctic is already causing summer seabed temperatures to rise way past their original 0°C level, to 7°C last year, and this is causing a rapid thawing of the offshore sediments in the East Siberian and possibly other seas. This in turn is causing a rapid growth in methane release. The well-grounded fear, based on observation and measurement of the near-surface sediments, is that a very large amount of methane will be released in a pulse in the very near future (estimates are 50 gigatons within the next 10 years). This would be a catastrophe for the planet, warming it by 0.6°C within only 1-2 decades (faster warming that that induced by CO2). This risk is serious enough to make Arctic offshore methane the no. 1 immediate problem facing mankind, in my view and that of many other Arctic scientists. You will not have heard this from the group that accompanied or preceded me, but none of them works directly on Arctic sea ice in the field, so appreciation of this problem has been dangerously slow. Risk equals (chance of...
something happening) multiplied by (severity of result if it does happen). In this case the chance is high – at least 50% - while the severity is catastrophic. It is therefore vital that this be placed in the forefront of our concerns and our research efforts. A way of trying to reduce or stop the methane emissions must be sought – if not by geoengineering (which may not work locally) then by techniques such as those suggested by geologists which amount to neo-fracking, ie drilling underneath the thawing sediments and bringing the methane into voids from which it can be pumped out. Research efforts on these questions need to be started now and given high priority. I offer this as a heartfelt warning.

Yours sincerely,
Peter Wadhams
Professor of Ocean Physics
Cambridge University
Professor Frances Wall, Professor Michael Bradshaw and Dr Richard Powell – Oral evidence (QQ 142 – 157)

Transcript to be found under Professor Michael Bradshaw
In response to the request for comments on how the Government should relate to the Arctic Council in the area of mining, I carried out some more research on the remit and outputs of the Arctic Council with respect to mining.

1.1 The Arctic Council has been active in ensuring that Arctic populations are well-informed about the issues involved in exploration and mining operations and thus better able to participate in decision-making processes. This seems a useful and sensible role. The Sustainable Development Working Group of the Arctic Council produced an information guide on mining in 2011 (Sustainable Development Working Group of the Arctic Council Circumpolar Information Guide on Mining for Indigenous Peoples & Northern Communities, 2011, 120 pp. http://www.sdwg.org/media.php?mid=1206, accessed 15.10.14)

‘The purpose of the Guide is to increase the ability of Indigenous peoples and residents of northern communities to understand, influence and participate in mining-related processes in order to maximize benefits and minimize negative effects on their lives, culture, land and the environment.’

The guide is well written and is based on similar material produced by Natural Resources Canada (the Canadian geological survey). The best practice in that earlier document has now been made relevant and available to the whole Arctic community. In my opinion, this is a good and useful initiative.

1.2 As mentioned during the oral evidence, I do not think that the mining industry would welcome an additional set of regulations implemented by the Arctic Council. However, a useful role is in information sharing amongst its members so that all can incorporate best practice into their relevant legislation and procedures. The Government could help ensure that there is a mechanism for results of relevant new research and best practice recommendations that originate in the UK to be shared with the Arctic Council.

2 I was concerned that the Select Committee had heard evidence that countries other than the UK are viewed as the best practice operators when dealing with indigenous populations.

2.1 In my opinion, there is no reason, and no excuse, why UK companies should be anything other than world leaders in responsible mining practices. My advice from an international mining consultancy company is that, in a sensitive environment like the Arctic, an environmental and social impact assessment (ESIA) could cost several million dollars in order to undertake a sufficient depth of studies. Companies vary in how willing they are to do this work, with a key factor being the ability to acquire project finance. All companies will be
required to do an ESIA but the amount of work will be variable. It is important to encourage UK companies to invest in best practice.

2.2 It is difficult to evaluate UK company performance in the area of responsible mining. Firstly because there is no simple good practice stamp of approval but also because mining is a very international business and companies are often listed on multiple stock exchanges, with operations and subsidiaries in multiple countries. There are only a few UK mining companies operating mines or exploration projects in the Arctic region but an important point is that there are many more companies working as consultants (see 3.2) who can encourage best practice although of course they are reliant on their client’s willingness to pay. I have given three examples of mining companies with UK connections below.

2.3 Anglo American, primary listing on the London Stock exchange, is currently exploring the Sakatti Copper-Nickel-Platinum Group Element deposit in northern Finland and is 85% shareholder in De Beers, which operates the Snap Lake diamond mine, ca. 200 km south of the Arctic Circle in Canada. Anglo American is a founder member of (ICMM) and so uses the Global Reporting Initiative (GRI) A+ standard of reporting with independent third party assurance to report its sustainability performance, including work with indigenous communities. The ICMM (International Council on Mining and Metals) is a CEO-led organisation based in London that brings together 22 large mining companies to set and promote good practice.

2.4 ArcelorMittal is developing the Baffin Island iron ore deposit through its 50% shareholding in Baffinland Iron Ore Mines in Canada. Although it has a London address, it is listed on eight overseas stock exchanges. ArcelorMittal is among the largest mining companies in the world with mining operations in ten other countries. Its web pages and annual reports articulate a strong commitment to sustainable development but it is not a member of the ICMM (International Council on Mining and Metals). The ArcelorMittal corporate responsibility report meets application level B+ of the Global Reporting Initiative (GRI) G3.1 guidelines. The company also uses the well-recognised AA1000 Accountability Principles Standard (AA1000 APS 2008) and is implementing the United Nations Global Compact (UNGC) principles (2012 corporate responsibility report achieved ‘advanced level’ reporting status by the UNGC).

2.5 London Mining PLC is a much smaller company that has been developing the Isua iron ore deposit in Greenland. It has one operating mine, the Marampa mine in Sierra Leone. Its head office is in London and it is listed on the London AIM stock exchange. The company has a large section on sustainability on its website, including an award, but no mention of any international management or reporting standards. As of 16 October 2014, London Mining PLC is in administration; financial viability is an essential part of responsible mining.

3. Comments on Government funding and enabling UK bodies to participate in international engagement on the Arctic

3.1 There has been support from UKTI to help companies participate in mining activities in the Arctic. In March 2013, the UK Trade & Investment Europe team organised an event in
London called ‘The Arctic Challenge: Mining in the High North’, where invited guests gave presentations on opportunities in the Arctic. One hundred UK companies, primarily made up of companies in exploration and junior mining, construction and infrastructure, financial and professional services, mining consultancy and analysis, and other service providers attended. This initiative has now finished but company interest would have been followed up by the relevant country UKTI staff (information confirmed by communication from Martin Olds, UKTI, 6th October 2014.)

3.2 There are more UK consultants than UK mining companies working in the Arctic region. I have listed some examples below. They would have benefited from the UKTI initiative but also may benefit from a mechanism to ensure they are involved in, and kept up to date with, the results of research and best practice studies in the UK.

- AMC Consultants (UK) Limited [www.amcconsultants.com](http://www.amcconsultants.com) Independent mining consultancy, providing services exclusively to the minerals sector.
- CSA Global [http://www.amcconsultants.com](http://www.amcconsultants.com) Privately-owned consulting company that provides multi-disciplinary services to our clients in the global resources industry. Has an office in UK, and in Russia
- Golder Associates [www.golder.co.uk](http://www.golder.co.uk) Employee-owned, global organisation, consulting, design, and construction services in our specialist areas of earth, environment, and energy
- SRK Group ([http://www.srk.co.uk](http://www.srk.co.uk)) Mining consultancy services, wholly owned by SRK employees, with offices in many countries, [http://www.srk.se.com/en/contact-us/se-offices-map](http://www.srk.se.com/en/contact-us/se-offices-map), including UK, Denmark, Sweden, Canada (5 offices), Russia.
- Tetra Tech [www.tetratech.com/services/arctic-engineering.html](http://www.tetratech.com/services/arctic-engineering.html) Has specialist Arctic engineering
- Wardell Armstrong / Wardell Armstrong International [www.wardell-armstrong.com/mining](http://www.wardell-armstrong.com/mining) Geological and mining consultants providing consultancy, management and contracting services to the mining industry. Based in UK but also has an office in Russia.

3.3 There is relevant research in a number of UK Universities. I am most familiar with, and thus listing, examples of universities that have relevant geological projects and mining studies. Besides Camborne School of Mines, University of Exeter, these universities include the Department of Earth and Environmental Sciences, University of St Andrews; Department of Earth Sciences, University of Cambridge; Earth Sciences Department, Natural History Museum, London; School of Environment and Technology, Brighton University and also the British Geological Survey. There are research connections to companies based in Scandinavia, Greenland and Australia, as well to overseas universities working in the Arctic region. It is an important point that there will be other environmental and socio-economic studies that are also be relevant to development of resources.

3.4 The Natural Environment Research Council has an Arctic Research Programme, focussed on climate change, running from 2010 to 2015. It might be timely for the UK Research Councils to consider whether an integrated research programme on the Arctic, including
resources and socio-economic issues, as well as climate change, and involving industry partners would be a productive next step for the UK.

October 2014
Matthew Willis – Written evidence (ARC0043)

The present state of security in the Arctic and implications of the tensions in Eastern Europe

1. Contrary to the impressions conveyed by labels like the ‘New Cold War’ or the ‘Scramble for the Arctic’, the Far North is a stable region where tensions are, and have every reason to remain, low. In the absence of the conditions that could trigger jockeying for territory or resources, the Arctic states have focused mainly on the sustainable economic (and in some cases social) development of their respective northern zones – an activity in which all can engage more effectively by co-operating than competing.

2. The tensions between Russia and the ‘West’ in Eastern Europe are not likely to overflow into the Arctic in a meaningful military-strategic way. From a Russian perspective, there is too little to be gained and too much to be lost from belligerence, and no other Arctic state has any reason to alter the status quo. There is a danger, however, that the Western bloc could shift Russia’s strategic calculus inadvertently. Defensive moves involving the Arctic, whether through the strengthening of the NATO missile defence system or the expansion of the Alliance to Sweden and Finland, would appear distinctly offensive to Moscow. In a worst-case scenario, they could turn what has so far been only a regeneration of Russian military capabilities in the Arctic into something closer to a remilitarisation.

3. This submission offers an assessment of the current political and military reality in the Arctic, followed by a brief discussion of Russia’s Arctic interests, mindset and plans. After addressing the present tensions’ conceivable military-strategic implications, it touches on their plausible politico-diplomatic impacts and concludes with a short list of policy recommendations for Her Majesty’s Government.

4. On a definitional note, ‘Arctic security’ is treated herein as the aggregation of the Arctic states’ mindsets, policies and activities concerning the region as a military-strategic theatre. The term, and the variations on it that appear below, should therefore be understood in the traditional sense of security, involving hard power; this submission does not touch on other ‘securities’ such as environmental, energy or human security.

The Arctic so far: an economic zone of low tension

5. For the eight states with Arctic territory, the Far North figures prominently as a source both of national identity and economic prosperity. This mixture, whose composition varies country-to-country, makes it important to all of them, and especially to the five with Arctic Ocean coastlines. Crucially, however, since the end of the Cold War and the subsidence of geopolitical tensions between the blocs, the region’s military-strategic importance has declined even as its economic importance has risen. This phenomenon explains why, although every Arctic state has released an Arctic strategy over the past decade, the profile

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215 The Arctic states are: Canada, Denmark (Greenland), Norway, Russia, the United States, Iceland, Finland and Sweden. The first five are the acknowledged coastal states, although Iceland considers itself one as well.
of defence and security in these documents is consistently low. To illustrate, in Canada’s 2011 Arctic Foreign Policy, the terms ‘defence’ and ‘security’ figure fewer than five times between them; in Norway’s 2009 High North Strategy update, ‘defence’ appears a mere three times and ‘security’ eight – including in food- and energy-security contexts.

6. Energy resources have been identified as a potential driver of competition, even involving extra-regional actors. The basic assumption underpinning talk of inter-state competition is groundless, however, since the vast majority of accessible hydrocarbons lie in undisputed national jurisdictions. It should also be noted that extraction of Arctic hydrocarbons, an extraordinarily complex undertaking technically and technologically, typically requires not only political stability, but also consortia comprising oil and gas firms from different countries. Extraction activities are thus inherently co-operative, although commercial disputes can arise, as the case of British Petroleum, TNK-BP and Rosneft showed.

7. Unanswered questions over maritime boundary delimitation, primarily in the Bering Strait and around the Lomonosov Ridge, mean that potential for political friction exists. However, given the 2010 Ilulissat Declaration, whereby the five Arctic coastal states committed themselves to the orderly settlement of overlapping claims, the odds favour a negotiated solution to current and future differences.\(^{216}\) The resolution of the Barents Sea dispute between Russia and Norway in 2011 showed both the sincerity underpinning the Ilulissat document and the incentive for co-operation that unexploited hydrocarbons can present.

8. The much-documentated enhancement of regional military capabilities is widely misunderstood and (save for the Russian case) less significant than depicted. Norway moved its National Joint Headquarters to Bodø – inside the Arctic Circle – in 2009-10, Denmark established a new Arctic Command at Nuuk, Greenland, in 2012, and Canada has been experimenting with a hub-and-spoke system of supply depots in order to project its forces northwards more effectively. But much of the Arctic states’ ostensible procurement has been either modernisation of existing, or replacement of obsolete, equipment, and little of it has been Arctic-specific.\(^{217}\) Even more importantly, bellicose intent is absent from their plans. The Arctic militaries’ role is to support civilian agencies in day-to-day activities and emergencies. These include: aerial surveillance, anti-smuggling inspections and fisheries monitoring; patrolling or simple provision of presence; search-and-rescue on land or at sea; and even assistance with oil spill-response efforts. Such tasks fall to the armed forces because, with some exceptions, only they have the training, equipment and other capabilities to operate in Arctic conditions.

9. The Arctic has never been a fundamentally military-strategic theatre. As Louis DeGoes, then-executive secretary to the US Committee on Polar Research for the National Science Foundation, remarked in the late 1960s, ‘In the Arctic and Antarctic the Russians and the United States have everything in common and very little in conflict. True, the polar areas are


of great strategic importance, but the development of modern weaponry has made physical
dominance and control less important than understanding and exploitation.’

10. Over the past 30 years, various initiatives have helped establish habits of regional co-
operation among the Arctic states. Almost exactly 27 years ago, on October 2, 1987, Mikhail
Gorbachev called for co-operation between ‘East and West’ to help make the Arctic a ‘zone
of peace’, where military activities could be reduced and natural resources better
extracted. Two years after Gorbachev’s proposal, in 1989, the Finnish government helped
launch a series of meetings designed to foster circumpolar co-operation on environmental
protection. Besides yielding the Arctic Environmental Protection Strategy, the meetings
laid the foundations of an intergovernmental forum for carrying forward discussions on
environmental protection and sustainable development: the Arctic Council.

11. A key condition of the Arctic Council’s establishment was that issues of defence and security
be kept beyond its remit. This stipulation allowed for a political atmosphere in which
potentially divisive issues could be kept off the table, helping to ensure that Russia never felt
itself encircled or otherwise threatened in the presence of four NATO members. As a result,
the organisation has been resilient at times of international discord, including the present.
(Incidentally, the Council may also serve, on occasion, as a venue for ‘offline’ discussions
about sensitive political issues, such as Syria.)

The Arctic as seen from Russia

12. The Arctic was a touchstone of Soviet national identity, and the Soviet Union’s ‘conquest’ of
the region – in the form of industrial development far beyond that achieved by other Arctic
countries – was a symbol of national greatness. The Arctic also gave the Soviet Union at once
strategic depth and an impenetrable rampart that allowed it to devote most of its attention
to its western, southern and eastern periphery. The basing of the Northern Fleet (and thus
the bulk of the country’s sea-based nuclear arsenal) at Murmansk made the Arctic a key
military zone as well. The severe economic and military decline that accompanied the Soviet
Union’s collapse drastically diminished the region’s profile.

13. The Kremlin’s plans to rebuild Russia’s Arctic military capacity have been interpreted as an
expression of territorial assertiveness motivated by hunger for offshore oil and gas, and even
an unvarnished desire for regional dominance. Given credence, such speculation provides a

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219 An article in the New York Times covered Gorbachev’s speech, and is available in the online archives:

220 Basic background on the Strategy can be found on the Arctic Council’s website: http://www.arctic-
council.org/index.php/en/about-us/arctic-council/history

221 See Alexander Pilyasov, ‘The Arctic Council’s Ukraine challenge,’ Barents Observer, May 12, 2014
plausible foundation for further concern – that the conflict in Eastern Europe could give President Putin a pretext to begin exerting pressure on the Nordic countries.

14. What some observers have labelled a militarisation is really an effort to return to the *status quo ante* – a level of capability commensurate with Russia’s self-image and perceived defence needs. The timing of this ambitious undertaking relates partly to the treasury’s oil-buoyed return to health, but there is an even stronger rationale: as it announced as early as 2008, Russia aims to make the Arctic its ‘foremost strategic base for natural resources’ by 2020.\(^{222}\) To do so, it must invest massively not only in economic infrastructure but, equally, in the military means to police a region being restored to national economic centrality. It certainly has no need to covet its neighbours’ seabeds: 43 of 61 large Arctic oil and gas fields already lie within its undisputed jurisdiction, accounting for fully 52 percent of the Arctic’s remaining reserves of undiscovered conventional oil and gas.\(^{223}\) The regeneration of the military should be seen as part of a much broader revitalisation of the entire Russian Arctic and, effectively, a ‘return to normal’ after two exceptionally grim decades.

**Potential fall-out from Ukraine for Arctic security**

15. Russia can therefore be expected to avoid any behaviour that could unsettle the region. That is not to say it will put an end to the ‘fly-bys’ its long-range bombers have carried out on the edges of its neighbours’ airspace since 2008. In June 2014, Ottawa reported an increase in patrols as compared to the two previous years, and in late August, Helsinki reported three airspace violations in a week. Nor does it mean it will halt the sorts of naval exercises and war games in which the Northern Fleet engaged in the Barents Sea throughout August and September.

16. But such activities do not risk shifting the Arctic’s military-strategic balance. (The aerial patrols in particular are unpleasant and unsettling, but little more.) In a region in which it has never been challenged, hemmed-in or humiliated, and in which everything it needs for prosperity is within its jurisdiction, Russia would gain nothing from raising hackles. It could, in fact, do itself considerable damage. Creating ‘incidents’ between Russian and Norwegian fishing vessels in the Barents, exposing Canada’s inability to enforce NORDREG (a mandatory self-reporting scheme for vessels operating in Canadian waters north of 60°N\(^{224}\)) or otherwise challenging established governance structures would likely backfire – most plausibly by diminishing the chances of recent sanctions’ being lifted.


\(^{223}\) Data from the US Geological Survey’s 2008 findings can be found at the accompanying link. It should be borne in mind that the estimates are probabilistic. Moreover, the mere presence of hydrocarbons is entirely separate from their extractability at an economically attractive price. USGS, ‘Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle,’ 2008 [http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf](http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf)

\(^{224}\) Information on NORDREG can be found here: [http://www.mondaq.com/canada/x/114788/Marine+Shipping/NORDREG+now+Mandatory+Within+the+Northwest+Passage](http://www.mondaq.com/canada/x/114788/Marine+Shipping/NORDREG+now+Mandatory+Within+the+Northwest+Passage)
17. Counter-intuitively, however, Russia is not the key player in the Arctic right now. Knowingly or not, it is the Western block that is playing with strategic fire. By imposing sanctions on Russia’s oil and – especially – gas sector, the ‘West’ struck at the heart of Russia’s economy, its prospects for long-term prosperity and, ultimately, its political stability. The message was clear and, given the situation as seen through Western eyes, no doubt deliberately calibrated. However, the sanctions carry more than economic meaning. Whereas Russia’s behaviour in Eastern Europe has been classically revanchist, that of a state believing itself to have been held down and ill-used, in the Arctic, Russia has never had any reason to behave that way. There, it is a (indeed, the) pre-eminent and respected power. Left in place, sanctions on the oil and gas sector could change its outlook.

18. Developments relating to the Western bloc’s military posture could be even more significant. Although NATO’s remit naturally encompasses the Arctic by virtue of Canadian, American, Danish, Norwegian and Icelandic membership, its low profile is clearly one reason for the absence of geopolitical tension. Events this year, however, have triggered renewed calls to make the Arctic a higher priority, particularly from Norway. Combined with the deployment of the NATO rapid reaction force agreed at Newport and the probable expansion of the ballistic missile defence system (conceivably via Norwegian AEGIS-equipped frigates), movement in that direction risks putting the Arctic ‘in play’. Finnish and Swedish NATO accession, unlikely though it is, would be sure to rile Moscow.

19. It does not matter that Western governments believe themselves to be reacting. As Mikhail Popov, Deputy Secretary of the Russian Security Council, recently observed, ‘We were assured about [NATO’s] good intentions [in 2010], but the actions of recent years suggest the complete opposite. [...] Russia is always expected to make unilateral concessions on many issues of international relations....’ Russia has a victim complex, and a defensive move by the Western bloc in the Arctic will only reinforce Moscow’s suspicion that Ukraine is but a pretence for expanding the ‘pressure’ under which NATO and the European Union have put it for two decades. That is not to say that the Arctic should at all costs remain insulated from geopolitics elsewhere. Simply, Western governments should be as careful about the messages they send as the ones they intend to be received.

Other potential political fall-out from Ukraine

20. Only in extremis will Russia respond to Western ‘provocation’ in such a way as to alter current military-strategic assumptions in the Arctic. Its long-term goals are too important to be sacrificed under any but the direst circumstances. If it seeks to retaliate for Western actions in the North, it is more likely to choose another time and place. Thankfully, the odds of other sorts of fall-out in the region are relatively low as well, though greater than nil.

21. The annual Arctic Security Forces Roundtable (ASFR) has been the most notable casualty. The ASFR is a response to the fact that civil contingencies in the Arctic will require co-

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225 RIA Novosti interview, ‘Russian official interviewed on key areas of new military doctrine’ (trans. BBC Monitoring), September 2, 2014.
ordination between the militaries of different countries, and not only between the civilian agencies and military of a single country. The ASFR’s purpose is thus to bring together military officials from the Arctic states (and northern Europe) to strengthen working relations and discuss technical-level aspects of co-operation. One of the Forum’s biggest virtues is the way it builds trust among participants. Unfortunately, Russia did not participate this year. If the absence of the Arctic’s single most capable player continues for long, the value of the ASFR will be substantially diminished. Most damagingly, the channels for military-to-military communication it has helped open between Russia and its neighbours – vital to co-ordinating a response to any emergency – are likely to close up.

22. On the whole, the consensus-based Arctic Council (AC) is weathering the storm. Canada’s non-participation in the meeting of the Task Force on Black Carbon made headlines, but it was a token gesture, and substantial efforts have been made to ensure Russian delegates attend AC meetings in Canada. In 2015, however, Canada will cede the chairmanship to the US. Washington will not unveil its agenda for some time, but Russia could prove an insuperable obstacle to any major American initiative should it so choose – without affecting the scientific work taking place within the Council’s six working groups.

23. Obstructionism is an option that cannot be ruled out. Should the Kremlin shift gears and abandon co-operation, it could harm its neighbours in any number of ways. If it banned its scientists from participation in international polar research or Arctic Council working groups, some projects would stall. If it refused to negotiate with Canada or Denmark over the delineation of national boundaries on the Lomonosov Ridge, it could keep parts of the Arctic Ocean in legal (and economic) limbo for decades. If it wished to needle the United States, it could find reasons to exclude Washington from discussions of maritime law on account of Congress’s refusal to ratify the UN Convention on the Law of the Sea. These scenarios are not beyond the realm of possibility, particularly if hard-line nationalists in the Kremlin strengthen their hold on policy-making.226

24. Fortunately, such scenarios appear extreme. Despite his palpable anger at Western governments’ actions, Mikhail Popov, quoted earlier, still spoke positively of the Arctic: ‘It should be noted,’ he said ‘that we are open to partnerships in the Arctic. We not only call for cooperation, but we support our intentions with actions.’227 Putin, too, appears to understand just how important good working relations are.

25. Moreover, the insulation protecting the Arctic is highly resilient to the vagaries of international politics. Let two examples suffice. The infamous Arktika expedition of 2007, which ended with Russia’s flag on the seabed, was made possible only by the international web of personal and professional relationships uniting a collection of veteran scientists, entrepreneurs and explorers from Australia, Russia, Sweden and the United States.228 And,

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227 RIA Novosti, op. cit.

228 The concise history of the expedition written by one of its participants deserves wider circulation: http://www.explorers.org/flag_reports/Mike_McDowell_Flag_42_Report.pdf
although states are often treated as the Arctic’s only political units, the regions are equally important. At a conference in September, the head of Troms County Government and the governor of Arkhangelsk both called for Norwegian-Russian co-operation to continue regardless of the geopolitics. There are, in other words, myriad interconnected sub-national actors able to keep the Arctic working. The strength of their bonds would almost surely withstand a real ‘New Cold War’ – but it would clearly be preferable not to find out.

Concluding observations and policy recommendations for the UK

26. There are excellent reasons, therefore, to believe the Arctic will escape the worst of the fall-out from Eastern European tensions. It is a region whose military-strategic significance is far lower than its economic-strategic significance, and in which habits of co-operation are well-established. Everyone has an economic stake in its continued stability, and Russia’s is of virtually existential size.

27. The regeneration of Russia’s Arctic military presence is partly driven by the felt need to restore a base level of capability following the post-Soviet atrophy. This imperative ties into the Arctic’s place in Russia’s psyche as well as concerns caused by the Arctic’s increasing accessibility – and thus diminishing defensive quality. But the region’s accessibility is driving military investment in a ‘positive’ sense as well: very simply, the security needed to anchor Russia’s all-or-nothing economic plans demands it. Along with the coast guard and FSB, the armed forces will provide the presence, surveillance capability and contingency-response capacity needed to support the government’s civilian agencies – and the operations of international commercial actors.

28. Western governments could change Russia’s strategic calculus if they carry their military response too far north. The imposition of oil and gas sanctions already qualifies as a strategic Arctic thrust, though one Moscow will aim to return somewhere other than the Arctic. Should it believe a military follow-up is in the offing, however, even its economic ambitions may not suffice to dissuade it from responding militarily too. This is a scenario the ‘West’ should take care to avoid.

29. Bearing these arguments in mind, what actions should the United Kingdom take? The ‘Arctic Policy Framework’ (2013) is the document defining the UK’s current posture towards the Arctic. It formalises Britain’s commitment to the region’s security and stability, and states its intention to pursue that goal through defence engagement and bilateral security co-operation. The UK should make good on this intention. Active partnerships (such as with Norway and Sweden, with whom it has bilateral defence agreements) and engagement in

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230 Importantly, as laid out on page 7, the document is an exposition of the UK government’s policies towards the Arctic, not a strategy: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/251216/Adapting_To_Change_UK_policy_towards_the_Arctic.pdf
plurilateral groupings (such as the Northern Group) have many benefits. They reassure allies of our intention to remain present; help them improve their defence capacities; yield cold-weather training opportunities for UK forces; and generally contribute to a strong political and military fabric across the ‘sub-Arctic’ region.

30. More specifically, the UK should demonstrate its intention to remain engaged in the north by replacing its stable of Maritime Patrol Aircraft after the next Strategic Defence and Security Review. Norway has picked up the slack since the demise of the UK’s Nimrods and now patrols a portion of the North Sea that would ordinarily be Britain’s responsibility. Oslo is understandably keen to see the UK resume aerial patrols, and given the likelihood that maritime traffic in the Greenland-Iceland-UK Gap and North Sea will gradually increase, there is every reason it should.

31. The British government should also commit to maintaining, if not increasing, the number of Marines and other personnel it puts through cold-weather training facilities in Norway’s High North. These facilities are expensive to keep open, not least because Norway gives countries like the UK such a good rate for using them. The UK would derive clear benefit from continued access to Norway’s facilities, but committing longer-term would also be the kind of tangible engagement Norway is seeking from its NATO allies. Similarly, the UK should continue participating in Exercise Cold Response, the Norwegian-led biennial international military exercise in which 14,000 troops (including Britain’s) partook in 2012.231

32. The UK should adopt a considered stance on a northward NATO ‘pivot’. Any change in posture that made NATO a de facto Arctic actor must only be made on the understanding that it is liable to trigger an energetic Russian response. In view of the Western bloc’s hesitancy to commit itself to anything more than a half-hearted trial of strength with Russia so far, opening up a second, potentially military-strategic front is probably unwise.

33. Finally, the UK should rebuild Russian and Eastern European expertise in the Ministry of Defence and Foreign Office. The atrophy in their capacities since 1991 may be partly responsible for the seeming failure to foresee the price of EU and NATO eastward drift. More importantly at the present juncture, its reversal now will not only improve the UK’s grasp of European geopolitics, but also strengthen its voice in NATO and on the Continent.

The author gratefully acknowledges the valuable advice and research input of Dr Igor Sutyagin and Ben Shook.

September 2014

231 Information on the last and forthcoming editions of Cold Response can be found here: http://mil.no/exercises/coldresponse/Pages/about.aspx
Dr. Nalân Koç and Dr. Jan-Gunnar Winther – Oral evidence (QQ 81 – 97)

Transcript to be found under Dr Nalân Koç
Dr. Richard Wood, Rear Admiral Tom Karsten RN and Roderick Johnson – Oral evidence (QQ 214 – 225)

Transcript to be found under Roderick Johnson
World Meteorological Office’s Polar Prediction Project–Written evidence (ARC0026)

1. Improved weather and environmental prediction is urgently required to safely and responsibly exploit the resources and opportunities that the Arctic can offer society. The Arctic is host to a variety of weather and weather-related hazards, including: severe wind storms, blizzards, poor visibility due to fog and low cloud, severe ocean waves and sea-ice.

2. Short-term weather and sub-seasonal climate forecasting is less skilful for the Arctic than elsewhere on the planet. There are numerous reasons for this situation, including: relatively few in situ observations with which to initialise Numerical Weather Prediction (NWP) models; the difficulty in accurate retrievals of observations from satellites; a sub-optimal observing network (for historical and geopolitical reasons); a historic lack-of-attention in NWP model development for processes that are unique or more prominent in the polar regions; and the importance of coupled atmosphere-ocean-sea ice processes for day-to-day forecasts (in contrast to mid-latitudes), which implies coupled models need to be employed (most current forecast models are atmosphere only). At present it is not known which of these deficiencies are the greatest blockages improving the skill of environmental prediction.

3. Recognising this relative lack of skill for a region of growing significance, the World Meteorological Organisation’s World Weather Research Programme initiated a decade-long Polar Prediction Project (PPP), starting in 2011, with its mission being to “Promote cooperative international research enabling development of improved weather and environmental prediction services for the polar regions, on time scales from hours to seasonal.” The PPP has an International Coordination Office in Germany and a Steering Group of about 15 international experts, drawn from academia and national meteorological services, covering all aspects of polar prediction. The PPP has received modest operational funding from around a dozen national meteorological services, many of whom are committed to fulfilling the mission and aims of the project. Further details on the PPP can be found in a Science Plan (2013) and an Implementation Plan (2013), both available on the project website http://www.polarprediction.net/

4. A Year of Polar Prediction (YOPP) is planned to provide a focus for observational campaigns and a test ground for enhanced operational and experimental NWP from national meteorological services such as the UK’s Met Office and the European Centre for Medium-range Weather Forecasts. The YOPP is planned for mid-2017 to mid-2019 and, it is hoped, will include a major international effort to run a Multi-disciplinary drifting Observatory in the Arctic for at least a year. (The last time this occurred was twenty years ago in a region that no longer has summer sea ice!). The Polar Prediction Project are leading development of the YOPP, but other Arctic...

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Coauthors: Prof Ian Renfrew, University of East Anglia, Dr Jonny Day, University of Reading, and Prof Thomas Jung, Alfred Wegner Institute, Steering Group Members of the World Meteorological Organisation’s Polar Prediction Project
science committees, international science organisations and international & national funding agencies are starting to commit energy and resources to this initiative.

5. UK scientists have played key roles in developing the Polar Prediction Project and are well-placed to undertake world-leading research during the YOPP. The Met Office currently runs one of the foremost global operational weather forecasting systems, however this system (in common with all NWP systems) has known problems in the Arctic, which will require new research to fix or ameliorate. The YOPP will present an outstanding opportunity to undertake such new research.

6. The current status of weather and environmental prediction for the Arctic is relevant to a number of the Questions posed in the Select Committee’s Call for Evidence. In particular:

   a. **Q1**: recent changes have made polar prediction on daily to subseasonal time scales even more challenging, as previous observational data sets are becoming redundant (as the sea-ice has changed), and the coupling between the atmosphere/ocean/sea-ice system becomes more important.
   b. **Q2**: many new opportunities in the Arctic (e.g. shipping, natural resources, etc) will rely on skilful weather and environmental prediction for safe and responsible operation. Thus there will be opportunities for both national meteorological agencies and commercial environmental prediction services in this supporting domain, e.g. new services provided by ship-routing companies, new weather and hazard alert services, etc.
   c. **Q3**: improved environmental prediction, on a variety of time scales, has the potential to improve environmental protection and stewardship in the Arctic region. The UK could and should be involved in improved prediction services.
   d. **Q5**: There are currently insufficient data sets for the Arctic to allow the significant improvements in operational weather and environmental prediction models that are required. The Year of Polar Prediction presents an outstanding opportunity to obtain new high-quality data sets specifically tailored to improving pre-identified model deficiencies.

The above evidence is based on the Polar Prediction Project’s Science and Implementations Plans, which are available here: [http://www.polarprediction.net/en/documents.html](http://www.polarprediction.net/en/documents.html)

*September 2014*
Key points

- Climate warming and loss of summer sea ice is driving increasing pressure on Arctic ecosystems and communities. Tackling climate change at a global scale combined with a precautionary, ecosystem-based management approach to policy, governance and responsible development is needed to ensure effective stewardship of the region.
- Although not an Arctic nation, the UK has significant interests in the region, and the opportunity exists to strengthen the UK’s role by stepping up scientific, technical and policy engagement at Arctic Council (Working Group level), the IMO and other international fora.
- The UK Government should undertake an analysis of the 17 policy recommendations set out in CAFF’s Arctic Biodiversity Assessment (2013) and develop a plan of action.
- The UK Government should support a pan-Arctic network of protected and managed areas including areas of conservation importance identified on the basis of their likely resilience to climate change and continued importance to Arctic communities and species.
- UK business should demonstrate leadership in Corporate Social Responsibility and sustainable business practice, including responsible investment, in its dealings with the Arctic.
- The UK Government should commit to the principle of continuous improvement in the further development of its Arctic policy framework, including review and sharing of experience with non-Arctic nations.

1 Q1. What are the main issues arising from recent and unexpected changes in the Arctic region? How will these changes impact upon the Arctic, and what is the impact for the UK?
1.1 The Arctic has warmed at about twice the rate of the global average over the past few decades\textsuperscript{233} with much of the Arctic reaching temperatures above 0°C in summer. As a result, climate change is already de-stabilising important arctic systems, including sea ice, the Greenland Ice Sheet, mountain glaciers and aspects of the arctic carbon cycle including methane release from soils, permafrost, lakes wetlands and the sea-bed. Sea ice extent has decreased sharply in all seasons, with summer sea ice declining most dramatically. The last 8 summer sea ice extents have been the lowest on satellite record, and the rate of summer sea ice loss is now 13.3 % per decade\textsuperscript{234}. The Arctic Ocean is predicted to be virtually free of summer sea ice within a generation\textsuperscript{235}. Arctic change is unequivocal, and a return to

\textsuperscript{233} Sommerkorn, M and Hassol, SJ (Eds) Arctic Climate Feedbacks: Global Implications. WWF International Arctic Programme, Oslo, 2009. 97 pp.
\textsuperscript{234} https://nsidc.org/arcticseaicenews/
previous Arctic conditions is unlikely\(^{236}\). The impact of this on the Arctic’s physical and biological systems and people is large, has global implications, and is predicted to increase.

1.2 Climate warming in the Arctic will have far-reaching effects beyond the Arctic. For example, Arctic Amplification (the observed enhanced warming in high northern latitudes relative to the northern hemisphere) has been linked to more persistent weather patterns in mid-latitudes that can lead to extreme weather\(^{237}\), such as drought, flooding, heat waves and cold spells. Events such as the flooding experienced in the UK in December 2013 – January 2014, and the resulting social, economic and environmental impacts, may exemplify this.

1.3 Conservation of Arctic Flora and Fauna (CAFF), the Arctic Council’s biodiversity Working Group, published the Arctic Biodiversity Assessment (ABA)\(^{238}\) in 2013. The ABA, developed by more than 250 international experts including WWF, sets out the far-reaching impacts of climate change on Arctic biodiversity. The main conclusion is that climate change currently poses the most serious threat to Arctic biodiversity. Even though Arctic ecosystems and species could demonstrate some degree of resilience to climate variation, anticipated Arctic climate change will probably exceed the capacity for some species to adapt. ‘The key findings of the ABA are interrelated and responding to them would benefit from a holistic approach. When taken together, three cross-cutting themes are evident: the significance of climate change as the most serious underlying driver of overall change in biodiversity; the necessity of taking an ecosystem-based approach to management; and the importance of mainstreaming biodiversity by making it integral to other policy fields, for instance by ensuring biodiversity objectives are considered in development standards, plans and operations’.

1.4 Part 3 of the ABA: Report for Policy Makers provides a summary for policy and decision makers, with 9 key findings and 17 science-based policy recommendations to address the main pressures on Arctic biodiversity. The Recommendations, aimed at Arctic Council member states and Permanent Participants, are explicitly also directed at non-Arctic States. The ABA acknowledges that conserving Arctic biodiversity depends upon actions by such non-Arctic states, as well as industry. Despite being released in 2013, we are unaware of any response from UK Government departments to the ABA.

1.5 **Recommendation:** Relevant UK Government departments should undertake an analysis of CAFFs Arctic Biodiversity Assessment in collaboration with relevant stakeholders to determine how the UK might contribute expertise and capacity towards delivery of the recommendations, and publish a UK engagement strategy and action plan.

2. **Q3. How should economic development be balanced with environmental protection in the Arctic? Are appropriate systems in place to ensure correct balance is found and maintained? How should the UK be involved in establishing this balance?**

2.1 WWF supports responsible and sustainable development in the Arctic and for Arctic peoples. Commercial benefits must be balanced against the short and long-term risks to the Arctic people and environment. In its dealings with the Arctic, the UK must adopt a precautionary and transparent, cross-sector approach in the absence of comprehensive scientific understanding of how development might affect the region.


\(^{238}\) http://arcticbiodiversity.is/
2.2 London is a global centre for the Finance and Insurance sectors. UK-registered financial institutions therefore have an important role to play in backing sustainable business development which will also benefit the Arctic and its peoples, and in not supporting unsustainable activities in the Arctic.

2.3 However, there is currently little evidence to suggest that appropriate systems are in place to ensure a correct balance between economic development and environmental protection. One instrument that supports the integration of biodiversity into other relevant policy domains is the ecosystem services approach. WWF and partners are currently undertaking a scoping study for ecosystem services in the Arctic with the aim to identify their policy and governance context and highlight mechanisms where ecosystem services can help to advance Arctic stewardship and inform sustainable economic practices. Particular emerging concerns are the lack of available knowledge about services that are not or cannot be monetised (but underpin significant aspects of how Northerners and indigenous peoples benefit from nature), a paucity in integrated governance institutions and mechanisms that can accommodate appropriate consideration of the ways people benefit from nature, and a lack of available and implemented economic mechanisms that can consider ecological complexity and the insurance value of nature (resilience).

2.4 The Arctic Economic Council (AEC), a new coalition of Arctic businesses, was established in March 2014 by the Arctic Council. Made up of businesses appointed by the Arctic Council member states and Permanent Participants, it was given a broad mandate pertaining to economic development in the Arctic. However, the body will operate entirely independently, with no accountability to the Arctic Council. It may be that the AEC will assume the mandate currently held by the Arctic Council to deal with economic development in the Arctic.

2.5 WWF was supportive of the initial direction from Arctic Council Ministers to establish a circumpolar business forum. An open, transparent and accountable body could provide a valuable service in helping to define and encourage best practices to ensure sustainable and responsible development and business operations in the Arctic. But, as approved by the Arctic Council, the proposed body will be neither open nor transparent, and accountable to no-one but the large industries expected to cover the costs of the group. Instead, it will comprise an indeterminate group of business interests selected according to no clear criteria and acting on their own behalf, without any accountability to the Arctic Council or the diverse interests that have made the Arctic Council an important forum for addressing the most significant issues facing the Arctic. There is no mechanism in place to hold AEC accountable to the principles of sustainability, environment and responsibility. The next steps to implement the decision remain unclear.

2.6 **Recommendation:** The UK Government should join WWF in recommending that the Arctic Council establish clear criteria for admission to the AEC, ensuring the AEC operates in a transparent and open manner, and creating a broader advisory committee to the Arctic Council that will ensure the AEC advances only sustainable economic development and follows the Arctic Council’s major principles.

2.7 Past experience has demonstrated that the impact of an environmental incident such as a major oil spill in the Arctic can be severe and long-term. For example, the 1989 Exxon Valdez oil tanker spill resulted in 1, 300 miles of shoreline contaminated with oil; the mortality of 250,000 seabirds, nearly 4,000 sea otters, 300 harbour seals, 250 bald eagles and more than 20 orcas; billions of salmon and herring eggs destroyed; $20 billion in
subsistence harvest losses; $19 million in lost visitor spending the year following the spill; and at least $286.8 million in losses to local fishermen.

2.8 A report by WWF in 2009 highlighted that more than two decades after the Exxon Valdez disaster (and the extensive clean-up which involved more than 10,000 personnel and 100 aircraft), oil was still found on many beaches and intertidal zones in Prince William Sound, and up to 450 miles beyond 239 and continued to harm local wildlife, commercial fishing activities, coastal community cultures and the recreation and tourism industries. In 2003, scientists estimated that more than 80,000 litres of oil remained on the beaches of Prince William Sound. Oil that seeped deep into mussel beds and boulder beaches may continue to pollute the area for decades to come, as subsurface oil can remain unweathered and toxic for years before winter storms or foraging animals reintroduce it into the environment.

2.9 Despite the catastrophic and long-term impacts of this spill on Alaska’s people and marine resources, WWF concluded that oil companies and governments have made little progress in quickly and efficiently responding to oil spills in the Arctic. WWF predicts that, were it to happen again, a spill the size of the Exxon Valdez would likely prove equally as devastating.

2.10 The UK has a significant opportunity ahead of it to ‘raise the game’ at the International Maritime Organisation (IMO) negotiations taking place in London on the International Code for Ships Operating in Polar Waters (The Polar Code). WWF is concerned that despite clear original intentions to develop a comprehensive Code addressing all aspects of shipping safety and environmental protection in polar waters, the environmental protection provisions of the Polar Code have slipped.

2.11 The opportunity now exists to develop comprehensive environmental protection measures for inclusion in Phase 2 of work on the Polar Code (due to commence in 2016). Focused discussions should therefore progress requirements relating to the use and carriage of heavy grade fuel oil in the Arctic; the environmental and climate impact of ship air pollution including black carbon emissions; the prevention of the introduction of invasive species through ballast water discharges and hull fouling; the impact of underwater noise; the value of managing ship speeds as related to safety and environmental protection; restricting currently unregulated grey water discharges (galley, laundry and bathroom water excluding sewage); and ice strengthening / damage stability arrangements for category C240 ships operating in ice.

2.12 **Recommendation:** The UK Government should champion robust environmental protection measures in Phase 2 of the Polar Code.

3. **Q6: Are there climate change mitigation and adaptation strategies local to the Arctic that should be deployed or tested? What contribution can the UK make.**

3.1 A changing Arctic also means changing management and conservation needs. In order to adapt policies, planning and management to best support arctic ecosystem resilience, WWF developed *Rapid Assessment of Circum-Arctic Ecosystem Resilience*.

329 WWF-UK (2009). ‘Lessons Not Learned. 20 years after the Exxon Valdez Disaster Little has Changed in how we Respond to Oil Spills in the Arctic. 12pp. At: http://assets.wwf.org.uk/downloads/evos_final_report.pdf

240 Category A: ships designed for operation in polar waters at least in medium first-year ice, which may include old ice inclusions; Category B: a ship not included in Category A, designed for operation in polar waters in at least thin first-year ice, which may include old ice inclusions; and Category C: a ship designed to operate in open water or in ice conditions less severe than those included in Categories A and B.
**RACER**[^1], a new tool for identifying and mapping places of conservation importance throughout the Arctic on the basis of their likely resilience to climate change. RACER locates sources of ecological strength and durability (ecosystem resilience) and looks ahead to how they will persist in a climate-altered future. It involves a two-stage process: i.) mapping (principally by remote sensing) the current location of land and sea features which have high productivity and diversity and ii.) testing whether they will continue as sources of region-wide resilience against climate models.

3.2 The RACER methodology therefore looks ahead to anticipate the impact of change and the future capacity of ecosystems to adapt, rather than concentrating only on what is vulnerable now. This allows us to focus conservation and management techniques on priority areas where they will have the most benefit for the continued functioning of arctic ecosystems, including the ecological services people receive from them.

3.3 The RACER methodology has so far been tested in nine Arctic ecoregions, in marine regions off northern Norway, in the northern Canadian Archipelago and West of Greenland, in the Beaufort, Bering and Chuckchi Seas, and in terrestrial regions in western Greenland and Eastern Chukotka. WWF hopes this will inform national or regional spatial planning and decision making.

3.4 The UK Government has championed the trial of WWF’s RACER methodology for conservation planning in the Antarctic. WWF would welcome the support and endorsement by the UK Government of RACER as an important conservation planning tool for areas of the Arctic within, and beyond, areas of national jurisdiction.

3.5 WWF is working with Arctic governments to design and implement a pan-Arctic network of priority protected and managed areas. There have been efforts made to conserve areas of the Arctic, including notably the world’s largest national park in Greenland. However, these efforts are lacking in some important respects: firstly, they were established on a national and often opportunistic basis with little regard for the necessary representativeness of Arctic biodiversity. Secondly, with very few exceptions, the current protected area map of the Arctic covers only places on land – sea areas are severely under-represented. Thirdly, the areas of the Arctic that are protected were largely designated when the assumption was that the Arctic would remain in a steady state. Now that we know that’s not the case we need to ensure that a network of protected and managed areas in the Arctic responds to the challenge of change, that what we protect can act as a locus of resilience for Arctic wildlife and Arctic peoples, and is equipped with the necessary connectivity - corridors and linkages—that help Arctic biodiversity adapt to change. Without a circum-arctic plan, we may be creating pockets of biodiversity that will eventually be lost as they lack the necessary viability to persist.

3.6 One such example is the **‘Last Ice Area’** (LIA) an area of the Canadian Arctic islands and North West Greenland where scientists predict that year-round sea-ice will last longer than elsewhere in the Arctic. WWF is working with Inuit and local and national governments to chart a future for this area. We believe it will be critically important for the future of globally unique ecosystems and species that depend on ice, such as polar bears and narwhals, and for the Inuit whose culture and livelihoods are linked to the sea ice. CAFF has recently recommended that World Heritage Site status be considered for a part of the LIA, an option being explored by WWF. For the portion of the LIA that falls within the Canadian

4. Territory of Nunavut, WWF used the research it commissioned to inform a land-use plan for the territory showing the value of prioritizing conservation in the LIA.

4. Q8. How effectively does the UK interact with Arctic governance structures? Is the UK Government’s approach, as set out in the Arctic Policy Framework, proportionate and appropriate.

4.1 As a Permanent Observer, the UK plays a modest but constructive role within the Arctic Council Working Groups. Building upon the UK’s Arctic policy framework, the opportunity now exists for the UK to significantly step up its engagement at the Working Group level. Current examples may include:

- UK scientific and policy engagement in the Adaptation Actions for a Changing Arctic (AACA) project assessment and all other climate change, resilience and ecosystem approach work of the Council.
- Stronger engagement with the Emergency Prevention Preparedness and Response Working Group to contribute to oil spill response gap analysis and spill prevention measures, and the upcoming Circumpolar Marine Environmental Risk Assessment.

4.2 WWF welcomed ‘Adapting to Change, UK policy toward the Arctic’ as a first tentative step from the UK Government towards establishing a clear and transparent policy on UK activity in the Arctic. The policy contains some important principles against which civil society will hold the Government to account. Notably, this includes

- Promoting good governance of the Arctic through existing fora and legal mechanisms
- Respecting the views and interests of Arctic indigenous peoples and supporting their role in Arctic decision making
- Acting to limit global average temp. rise to below 2 °C above pre-industrial levels
- Promoting the conservation and sustainable use of biodiversity in the Arctic
- Minimising the environmental impact from responsible development of the Arctic.

4.3 However, WWF remains concerned that through the policy framework DECC continues to look to Arctic fossil fuels for the UK’s energy security. The risks and potential impacts of offshore arctic drilling are unacceptably high.

4.4 **Recommendation:** The UK Government should commit to the principle of continuous improvement in the further development of its Arctic policy framework. This would include i. regular (every 2 years) review of the policy framework ii. a plan of action for enhanced engagement across the Arctic Council Working Groups and iii. sharing experience of developing Arctic policy with other non-Arctic nations with current or emerging interests in the region.

*October 2014*
TUESDAY 4 NOVEMBER 2014

Members present

Lord Teverson (Chairman)
Lord Addington
Baroness Browning
Lord Hannay of Chiswick
Viscount Hanworth
Lord Hunt of Chesterton
Lord Oxburgh
Baroness Neville-Jones
Lord Soley
Lord Tugendhat

Examination of Witnesses

Dr Martin Sommerkorn, Head of Conservation, Global Arctic Programme, WWF, and Rod Downie, Polar Programme Manager, WWF UK

Q237 The Chairman: Good morning, and welcome to this evidence session of the Arctic Select Committee. This morning we will be talking to representatives from WWF as our witnesses, and to a representative of the European Commission in our second session. Presumably both of you have had a copy of our own interests and you will have some idea of the questions that we will put to you. I should remind you that you do not both have to answer all the questions. I will leave it to you as to who will lead, but if you have something important to say, please do so. Perhaps we could start by you both briefly introducing
yourselves and then we will go straight into the questions. I am not sure why the screen has just come down, unless it is for a zany PowerPoint presentation that I was not expecting.

**Dr Martin Sommerkorn:** My name is Martin Sommerkorn and I work with the WWF Global Arctic programme. I’m a scientist and have worked on the Arctic for 10 years. I attend most of the Arctic Council working group meetings on behalf of the WWF.

**Rod Downie:** Good morning, everyone. My name is Rod Downie and I work for the WWF programme here in the UK.

**The Chairman:** Thank you for being so concise. I also thank you for the written evidence that you have already provided for the Committee. It will be most useful. Perhaps we can start by asking you about the WWF Global Arctic Programme. It has been operating since 1992, so you have been in this area for a long time. What has been achieved over that period, and what do you see as your current priorities for the Arctic?

**Dr Martin Sommerkorn:** I can answer that. We started 22 years as a small shop that had been motivated by the opening up of Russia. We dealt with small-scale issues, affected areas, particularly in Russia, but always with international interactions on, for example, bird migration flyways. Over the past 20 years the Arctic has grown in global significance. We are very aware of that, so the Global Arctic Programme has grown with that increased global significance. Nowadays we regard the Arctic as a place of shared opportunities and shared responsibilities on a global scale. The WWF is uniquely placed to take care of this as we now have offices in all the Arctic countries except for Iceland, and through our global network we have the ability to connect across issues from the global scale to the local one. We work on the ground and all the way up to international arenas. We are often thought of as a biodiversity organisation, and yes, we often symbolise issues through that lens, but really we have a wider focus through emphasising the role of nature for people in human well-being,
continued development and—a topic that is growing more important—making a critical contribution to people’s ability to adapt to change. Our unique position in the Arctic is one that integrates across scales, sectors and interests, with a solid focus on a living Arctic with functioning ecosystems for people. We do this by empowering local people to do conservation through co-operation and participating ourselves by leveraging funds to do so. There are many examples of this, and Rod will take a couple of them on in a moment.

We are a trusted observer and a knowledge contributor to the Arctic Council as the key international forum of the region. We also communicate the significance of Arctic ecosystems, species and biodiversity to many audiences. We publish a quarterly journal called *The Circle*, and critically through our global network we broadcast the Arctic essence of biodiversity and the threats posed to it through processes like the UNFCCC and the IMO Polar Code. The work we do in the Arctic contributes to the development of biodiversity conservation practices.

**Q238 Lord Hannay of Chiswick:** Perhaps I may ask you one factual question. The word “circumpolar” appears rather frequently in your evidence but is never explained. Can you tell us what it means?

**Dr Martin Sommerkorn:** When we talk about “circumpolar”, we could swap it with the word “pan-Arctic”. When nations refer to the Arctic, they often mean their own Arctic territory. We are talking about the Arctic biome—terrestrial on land and marine.

**Lord Hannay of Chiswick:** Are you talking about the area within the Arctic Circle or does it go wider?

**Dr Martin Sommerkorn:** Actually, we would say that it is wider because we are issue focused. While there are many delineations of the Arctic—including ecological and geophysical ones, and those which use the Arctic Circle—our aim is to connect the issues. I
can give an example. When we work on reindeer, we even have to reach out into some aspects of what are called boreal systems because caribou spend some of their time in woodlands. But these are the same issues that the Arctic Council is grappling with because the working groups have several different delineations of the Arctic. They are all issue-based and are informed by politics.

**The Chairman:** Were you about to follow on from that, Mr Downie?

**Rod Downie:** I would be happy to give the Committee a few concrete examples of what we have achieved over the past 20 years. I like to think that we have achieved a lot, so please interrupt me if I give too many. We support and fund research in the Arctic because we are a science-based conservation organisation. We have funded the University of New York to undertake research into the effects of climate change on the Greenland ice sheet. We support the study and conservation of polar bears across the Arctic, which includes tracking bears to determine the effect of changing sea ice cover, and we also do work to minimise human/polar bear conflict in remote villages in the northern Arctic. We have trained more than 4,000 volunteers in coastal communities to respond to oil spills in the Arctic, and we have worked with local communities and Governments in 35 protected areas covering more than 370,000 square kilometres right across the Arctic, mostly in the Russian Arctic. In 2008 we also helped to create Canada’s first Arctic whale sanctuary, the bowhead whale sanctuary off Baffin Island. We help to protect Bristol Bay as a no-go zone for oil and gas development. Of course, Bristol Bay is America’s fish basket. We have in place temporary protection of Bristol Bay until at least 2017—the duration of the Obama Administration. We have worked with the fishing industry, particularly in the Barents Sea, to commit to Marine Stewardship Council assessment, which we see as a benchmark for sustainability in fisheries. Currently, more than 50% of the Barents Sea fisheries are MSC certified. We have helped to
develop sustainable Arctic tourism guidelines, particularly within Svalbard. Those are just a few examples of what we have achieved over 50 years, and we have published a celebratory brochure that we will be happy to provide for the Committee.

**Viscount Hanworth:** You say that you have no office in Iceland. Does that imply that you are absent from Iceland? If that is the case, why?

**Dr Martin Sommerkorn:** We do not have an office in Iceland, that is correct. The reason is that there is no strong funding base for us in Iceland. In the past we have had some intensive co-operation with local NGOs which has worked well with regard to land-based issues, especially in the area of hydro power, but currently we do not have an arm in Iceland.

**Viscount Hanworth:** Does that distress you?

**Dr Martin Sommerkorn:** I do not think it distresses us because we participate in many fora in which Iceland participates as well. Those are at the international level and therefore not necessarily with any strong domestic engagement.

**Rod Downie:** I would add that we have 13 offices in the seven other Arctic nations.

**Q239 Lord Hunt of Chesterton:** I have to declare a rather strange interest. My sister Perdita Jago used to be the public relations person at your office in Godalming. One must declare these things. My question concerns Arctic biodiversity and which particular aspects merit your attention. One thing that we not talked about explicitly is radioactive waste. There was quite a considerable programme on that issue. In fact, the NGO I am connected with, the Advisory Committee on the Protection of the Sea, was involved in a programme on it. A huge amount of pollution results from the metal extraction industries and of course as a result of the Cold War. There are still many problems in the area. Is it part of your campaign to look at these
issues? Also, I would be interested to know which aspects of the biodiversity of the area you regard as being particularly fragile.

**Dr Martin Sommerkorn:** I will start with your first question. We are not currently working on radioactive waste, mostly because there is a lot of good activity around it. Basically, we think that these issues are in good hands with the Arctic Monitoring and Assessment Programme. It is a benchmark for monitoring programmes worldwide and does a really good job in the Arctic. I would add that recently quite a number of clean-up programmes have been established, especially in the Russian Arctic. These also take care of some aspects of radioactivity. The third aspect, which may explain the strategic element of our position, is that while radioactivity is an issue and will remain one for a long time in certain places in the Arctic, we need very much to focus these days on the broad range of issues that affect the Arctic. We focus on the issues that affect biodiversity through larger-scale global drivers that we can abate and mitigate, and on threats that occur at the population level, or at the species level and the habitat level. Not only are these the biggest threats, they are also the most worthwhile to mitigate in order to have the greatest effect on resilient biodiversity.

On your second question, Arctic biodiversity is both tough and fragile. It is tough when it comes to the extreme and variable conditions that prevail in the Arctic, but the biodiversity is fragile when it comes to things like the destruction of habitats and limiting the range that wildlife needs to maintain a viable population. These ranges can be huge in the Arctic. Polar bears can feed here today and be hundreds of kilometres away a couple of days later. That reflects the fact that it is an environment where the resources are often sparse and few and far between.

A second element of fragile Arctic biodiversity is the key threats that endanger species which, due to the nature of the Arctic food webs, are not only species but key elements of
the Arctic food chain. They are short food chains with not much biodiversity at each level. By threatening a certain species you can take out an entire functioning ecosystem. Because the resources and the production of material and biomass are concentrated at certain points, threats to these places can actually endanger the wider functioning of whole eco-regions.

The third element connects with your starting point. Low temperatures in the Arctic inhibit the breakdown of substances, and because of the nature of the Arctic food chain, can make for their extremely efficient transport and accumulation. Substances can quickly reach toxic levels in the higher predators, for example. Nowadays we are very concerned about the cumulative impacts that come from a number of the threats that I have mentioned, and those are on top of the stark changes that we are seeing already and which we have been advised will become even stronger over the coming decades. So the cumulative effect of threats arising from human use on top of climate change are issues that the current system in the Arctic is not prepared to deal with.

**Q240 The Chairman:** Does that cover everything that Members wanted to ask? Perhaps I could follow up briefly. We are to some degree only scratching the surface of biodiversity. Can you explain the dangers of what could happen if this is not managed properly? I am trying to get a feel for what the dangers are if we manage to cross into these areas. What will the result be? I am looking for a bit more touchy-feely evidence about what might happen and what we are looking at here. Do you see what I am trying to say? I am interested in the thresholds.

**Dr Martin Sommerkorn:** Let us start with two significant thresholds that are both related to aspects of the Arctic that are unique, globally unique – they are globally unique ecosystems. An example of one of these globally unique systems is the sea ice ecosystem. We can see that the threats that come to the Arctic contribute to potential thresholds on populations of,
for example, polar bears, walruses and ice whales. That is because very often receding ice means that the contact between that ice and coastlines or with shallow shelf seas is lost. There is no longer any overlap between the ice layer and either the coastline or the shallow seas that provide food for the polar bear, walrus and ice whale populations. When the ice recedes in the summer, we will have a threshold crossed for many populations of polar bears. They cannot survive on ice alone. They need to come out of their dens in the spring, for example, on land. That is one key issue.

Another is that we have a very dynamic system that produces most of the marine biomass and thus most of the energy that enters the Arctic food chain—the sea ice marginal zones. Wherever the ice is in the spring when the sunlight is at maximum levels—that would be the summer for us, but it is spring in the Arctic—at those times when the ice breaks up, sunlight can penetrate, which generates plenty of plant and animal activity. These zones are not fixed places. They can occur here today and somewhere else the next year, with an overall trend for the zones to move northwards, of course. We have hardly any instruments to protect these flexible places from oil spills, accidents on ships carrying heavy fuel oil, exploratory drilling and so on. There is just one instrument that could lend itself to a more flexible protection mechanism. We can see that if we do not put such an instrument into place in a proactive fashion, there is a danger that there will be significant threats to critical parts of the ecosystem. They will be taken over the threshold of productivity.

**The Chairman:** Are you saying that these areas move around each year? In the UK we are implementing marine conservation zones that are strictly delineated areas set out on charts and that must not be crossed, but you are saying that that form of management could not work in the Arctic because the zones change so regularly. Is that the case?
Dr Martin Sommerkorn: There are examples of areas that change every year while others do not change. An ocean upwelling will not change significantly over a period of years and it will still provide, together with other drivers, the key productivity that underpins many Arctic ecosystems. We are saying that we need to be proactive and look ahead. We need to take the information that we have on the changing ecosystem in order to establish a core conservation-oriented regime now: that is, before these additional destructive activities become key threats.

Lord Soley: I understand why it is important to identify the critical tipping points, but I am not sure that that is fundamentally different from other areas. Let us take the example of coral. A very minor change in sea temperature can wipe out whole areas of coral. Are we talking about something that is essentially different, or are you saying that you want to identify the tipping points in the Arctic because we are not clear enough about them?

Dr Martin Sommerkorn: The short answer is that I am talking about the latter. I am talking about identifying them and incorporating them into planning.

Viscount Hanworth: Is it not the case that viciously unstable prey/predator cycles can be set in motion in the Arctic by human intervention? I am thinking of the classical mink/muskrat cycle. Do you have any evidence of this?

Dr Martin Sommerkorn: I would say that in a broad sense there are two issues in the Arctic in respect of food chains and predator/prey relations. First, our knowledge is only of certain spots in a certain area. We do not have a good handle on or plenty of knowledge of something that can penetrates areas more deeply. We have plenty of knowledge, but in many cases we cannot assess the population levels of a given animal.

The second thing is that the global community, regardless of whether we are talking about the Arctic, does not have a good handle on the question of how ecological connections are
going to pan out, given the geophysical changes that will take place over the coming years. We can model where critical elements for wildlife would still be a given for these species to survive. An example of this can be found in the north of Canada and Greenland where the ice is projected to remain for the longest period over the summer. However, we do not have much knowledge of how the ecological interactions will pan out in terms of what kind of species will migrate north, and have the ability to do so, as well as at what speed.

Q241 Lord Addington: I have a small advantage over the rest of the Committee in that I was in Reykjavik over the weekend. Can you confirm how different the ice formation is in different areas from year to year? This point was made clear to me when considering the northern sea route. In one year the route would be blocked even though the ice had been shrinking because it had moved off to a totally different place. That had not occurred to me. There is no guarantee that with reducing ice or expanding ice it will remain in the same place. I think that that is relevant to what is being said.

Dr Martin Sommerkorn: That is similar to the many perceptions of the Arctic as an area covered in ice, lifeless and very far away. Actually, to our minds the Arctic sea ice shrinks quite uniformly, but really the climate develops differently in different parts of the Arctic. Wind can drive the ice to different places. Ice can be created in different places every year. You are correct. We are not able to guarantee that the sea routes will be open and that there will be areas where non ice-class vessels can move around in safely.

The Chairman: We will come on to that aspect later.

Q242 Viscount Hanworth: Are the right mechanisms in place for balancing economic development and environmental protection in the Arctic? Can the desire of native Arctic communities to pursue their traditional lifestyles be easily reconciled with their evident desire to participate in and profit from modern economic environments? Additionally, what
measures would the World Wildlife Fund like to see in place to support biodiversity and environmental protection?

**Dr Martin Sommerkorn:** In a nutshell, I must response to your first question by saying, sadly, that the simple answer is no. We do not see these mechanisms in place, as neither policy integration nor governance instruments are fit to deal with the challenges posed by change. By rapid Arctic change, I am talking not only about climate change but about industrialisation, social change and so on. One tends to believe that these are all developed nations with good environmental regimes in place. Many good things have been done, but there are two large gaps. The first of those is how to deal proactively with change and how to incorporate what we know is coming in the future into our current policies and practices. We need to be strategic in our use of resources and about what that means for biodiversity conservation. The second point is that there is a threat that comes from a lack of Arctic-specific and Arctic-adequate protocols, standards and rules for industrial operations in the Arctic. They should be based on a thorough and future-oriented understanding of the Arctic environment and its significance for people.

Coming to the second part of your question, currently we do not have sufficiently good instruments in place to capture the many values that Arctic biodiversity has for people living in the Arctic, let alone putting them into a form that will actually inform our economic decisions. I can give an example of this. I am leading a joint WWF and Arctic Council study on scoping for ecosystem services in the Arctic.

**The Chairman:** The phrase “ecosystem services” is used very regularly by witnesses and I think I know what it means. However, could you explain it for everyone?
Dr Martin Sommerkorn: It can be broadly understood as a term to describe all the benefits that we receive from nature: that is, from functioning ecosystems. It covers all the values that we place on those benefits.

Viscount Hanworth: Do you think that sufficient emphasis been placed on the interests of the native Arctic peoples or do you think that their interests are currently being over-emphasised?

The Chairman: We will come on to that area a little later. The question is fine but I do not want to broaden the conversation too much. We will talk later about the work of the WWF with indigenous peoples.

Lord Hannay of Chiswick: Would you elaborate slightly on what you have just said about Arctic-specific versus general regulation? Are you basically saying that practically none of the overall global systems on human rights and on oil and gas developments and so on are of any use in the Arctic unless there are Arctic-specific variants?

Dr Martin Sommerkorn: I am saying that they should be specifically tested for their applicability and appropriateness in Arctic areas. That means that risk, and therefore the whole financial side of operations, is calculated with Arctic-specific risks. That brings us back to the value questions. What is being risked here? What values do people have with regard to functioning Arctic ecosystems and functioning Arctic biodiversity? That is needed in order to demonstrate the risk. All this is part of the operational standards that I have in mind when I talk about Arctic-appropriate standards.

The Chairman: Viscount Hanworth, I rather cut you off.

Viscount Hanworth: No, that is fine. I can see that my question is subsumed into another question.
Q243 Lord Soley: I want to be clear about WWF’s role in relation to mining and oil and gas. Would you campaign against developments if you thought they were wrong, or do you just evaluate and monitor and then decide? How do you see your role in relation to those things?

Dr Martin Sommerkorn: We are definitely not saying no to development. In the wider sense, economic development relates to human development and we would not deny anyone who has the right to develop resources to do so. We do not view several recent developments as necessarily a good idea, but in a wider fashion we are also desperately urging, in the 21st century that we are in, where the world is a connected place and we see the limits of our planet in front of us, that policies on development and ecology come together and become integrated.

Lord Soley: Which of those developments do you think are not a good idea?

Dr Martin Sommerkorn: With respect to developing fossil fuels in the Arctic, we think that there is an overarching problem and a clearly demonstrated issue with our need to leave additional fossil fuel resources in the ground; we saw it just yesterday in the IPCC synthesis report. There is a clear road to keeping our planet on an even keel.

Lord Soley: But that is not Arctic-specific, is it?

Dr Martin Sommerkorn: No, it is not.

Lord Soley: But your argument is that these developments are not desirable worldwide, not just in relation to the Arctic?

Dr Martin Sommerkorn: What I just said we are saying in relation to everywhere on earth, including the Arctic. We think that the Arctic is a good place for understanding this issue because it is the most affected.

The second issue for us relates particularly to offshore oil and gas development in ice-infested waters, because we do not think that the technologies to clean up spills or the
preparedness to deal with them in Arctic countries exist, so given that risk and all the values that an accident could destroy, we would advise not doing it before such practices are proven and in place.

**The Chairman:** We need to move on from that question and start moving through the others.

**Q244 Lord Oxburgh:** In your pan-Arctic network of priority protected and managed areas I think you said there were 35. Is that right?

**Rod Downie:** That is 35 that WWF has been explicitly involved in in planning for a future pan-Arctic network, including marine protected areas.

**Lord Oxburgh:** What role do you play in advising Arctic Governments on this, and do you feel that you are listened to? Does it have a bearing on fisheries management, wildlife and so on? What is your interaction with the Governments?

**Dr Martin Sommerkorn:** We have numerous ones and different ones for different countries. We are advocating pan-Arctic networks of protected areas, because they would be a strategic conservation planning and implementation instrument. We are saying that these have to be placed within spatial planning schemes in wider ecosystem-based management approaches. That sounds like a bit too much terminology, but it means that they should be centred in wider schemes that operationalise the goal of keeping the ecosystem in a functioning state.

**Lord Oxburgh:** You are saying that there has to be a system approach to this.

**Dr Martin Sommerkorn:** Yes, there has to be a system approach. Similarly, the network of protected areas would be a strategic conservation element inside such schemes. That does not mean only that there are areas that are off limits for everything; there is a key focus on the future and on where we need to invest strategically in order to address key features that
are a kind of nucleus of biodiversity functioning. As a first example we develop tools ourselves and bring them out through the Arctic Council working groups and others to identify such places. We have developed a tool called RACER, which we referenced in our written evidence. We are also working on how to identify potential places where protection can be done, and on exemplifying the management that can be done in these places. It is not all fences, it also has to be flexible.

I am part of an expert group called PAME—the Protection of the Arctic Marine Environment working group of the Arctic Council—which is now issuing a framework for a network of protected areas. A document on the marine environment that we are sending to the ministerial meeting next spring shows how this can be done, which instruments are available and what the objective and use of such a network would be. Through for example WWF Russia we are working specifically on gap analyses in the Russian Arctic that will show where to prioritise the establishment of marine protected areas.

As a last point, it seems to be very politically opportune at the moment, surprisingly—and suddenly, I have to say—to talk about this in the Arctic. Some of this is embedded in the wider conventional biological diversity—CBD—goals in relation to the need to protect certain percentages of our marine and terrestrial environment for biodiversity. The US declared its chairmanship programme under the Arctic Council just last week, and one of the things that it would like to see is building on the PAME framework document and urging Arctic Council nations to seek specific next steps on the implementation road. It seems to be politically opportune at the moment to talk about this, even though some nations might not yet be there.

**Lord Oxburgh:** You did not discuss this with the individual countries. You have basically done this through the working group. Is that right?
**Dr Martin Sommerkorn:** No, that is not correct. We are working on all these levels. As the Global Arctic Programme, we see ourselves not as a small office of 10 people co-ordinating and giving expert advise but very much as an integrated group across all Arctic countries and beyond. So whenever we do something at the Arctic Council, we also, critically, involve all our offices and relevant political people in the Arctic countries.

**Lord Oxburgh:** How damaging will it be if some countries do not take action on the areas that you have identified so that the system approach is disrupted, to an extent?

**Dr Martin Sommerkorn:** An honest answer is that that is reality. There are different rates of progress at different times. We are trying to stimulate that through various activities. We are advocating, for example, a regional sea approach and the implementation of ecosystem-based management schemes in Arctic countries. I am also an expert in the ecosystem-based management group of the Arctic Council, so there are various ways in which to contribute to knowledge building and maybe also to the political momentum.

**Lord Oxburgh:** I have a final question. This goes back a little to what we were discussing before. You were discussing the fact that the gaps in the ice, and the geography, vary from year to year. On average, one is going to see an increase in photosynthesis in the Arctic Ocean. Have you looked at all at the effect that that is going to have on the whole ecosystem balance? That is one of the few things that can be said with some degree of certainty.

**Dr Martin Sommerkorn:** We could talk about this for hours.

**Lord Oxburgh:** We do not have hours.

**Dr Martin Sommerkorn:** We have not worked on this ourselves, other than through the RACER tool that I have talked about. I will just give you a quick story and another fact. We had a workshop last year in Iqaluit, on Baffin Island, on one of our projects up there, and we involved a lot of Inuit fishermen and hunters from Greenland and northern Canada. These
fishermen said, “We have been catching a lot of big fish lately. We have no idea what they are, but they are big and they sure taste good”. As long as there is productivity, and increased productivity, many indigenous peoples will be very happy about their increased livelihood. However, and this is a scientific fact, this is not how this dimension of change that is forecast for the Arctic will actually happen and will affect it. To bring this to a point, it might not be bigger and better fish tomorrow, it could be all jellyfish. We do not know how the system will react.

Viscount Hanworth: What were the big fish called?

Dr Martin Sommerkorn: We did not know. They did not know either.

Q245 Lord Hunt of Chesterton: I visited Iceland in the 1990s, and they commented that in north-west Iceland the fishing has been very successful over many years—once they got the Brits out and preserved all their fisheries, as you know. It has the highest income per capita almost anywhere in Europe, maybe even the City of London.

You have talked a lot about the marine side, but there has been a huge change in the ecology that is associated with the melting permafrost. I am surprised at how few of our witnesses talk about the permafrost melting. It is a huge effect and it is not being modelled in the IPCC. Why are you people not banging on about it more?

The Chairman: A brief answer, please, although it is a big question.

Dr Martin Sommerkorn: A brief answer is that I am a permafrost researcher, so I should not have forgotten it. We will see huge changes to the tundra, which is extremely important. The result will be drying in some places and increased wetness in other parts of the surface when the permafrost melts. There is also a global effect on top of that: that will release potentially significant amounts of carbon into the atmosphere as either CO$_2$ or methane. That might be why so few people bang on about it: because we have no mechanism in place that could
capture this kind of stuff. There is no policy mechanism even at the UNFCCC, and believe me we have tried, to capture this aspect. That might be the real reason why we are not talking about this more.

**Q246 Baroness Browning:** We had an impressive sample from Mr Downie of the projects that you have been involved in, but, given your Arctic Council observer status, can you say something about recent changes in the structure of the council, and in particular whether you have concerns about longer-term projects? We get the sense from evidence that there is a bit of worry about the short-termism and the lack of structure in looking at the projects. Would you like to say something about that?

**Dr Martin Sommerkorn:** The Arctic Council is also wrestling with the opening up of the Arctic, and we believe that it should move forward on the premise that this is a shared opportunity and a shared responsibility that must include the observer nations. Many of the threats to the Arctic are actually coming from outside the region; they come through industrialisation, climate change et cetera. The Arctic Council is wrestling with this because while it realises this, it also wants to keep as much sovereignty and control over the place as possible.

We are saying that it should do so by moving very fast and more efficiently on enforcing policies that ensure that the development is sustainable and the environment is protected. We would like to see the council take on, as a more urgent programme of work, accommodating change, being proactive, and ensuring stronger implementation and stronger connections between the economic and the environmental issues. Sadly, what we see for some of that is the opposite. An economic council was recently established through the Arctic Council that we do not think is set up properly in order to contribute to the
integration of policies; rather, it is somewhat free-ranging and uncontrolled. While that might not be particularly harmful, it is also not particularly constructive.

I come back to the ecosystem services work. What we need for this—and this is also a recommendation of the Arctic biodiversity assessment recently issued by CAFF—is the mainstreaming of biodiversity throughout all policies and practices. If we keep them separate from economic practices, we will not actually come up with a proper, let us say, overall sustainable regime in the Arctic. The Arctic Council should really take hold of its remit on sustainable development and spearhead this.

**Baroness Browning:** When the chair changes every two years, does the focus move automatically on to whatever are the priorities for that particular chair over their term?

**Dr Martin Sommerkorn:** That is correct, but the work programmes for the working groups are mostly longer term, so there is a buffer mechanism in place for that. The working groups are quite strong: indeed, some would say that they are the strongest element of the Arctic Council.

**The Chairman:** Has the influx of observer states, including from some regions that are quite far away, affected the chemistry of the Arctic Council, your own influence, or that of other observer bodies?

**Dr Martin Sommerkorn:** It has affected the number of people who sit in the working group meetings, and sometimes it allows quicker links to be made to existing expertise and capacity beyond the Arctic nations by the countries offering them, especially in the area of science. But I do think that it has changed the essence of the game. Most of these observers are just observing; they are not stepping up to the plate and saying, “Well, shared responsibilities, shared opportunities”.

**The Chairman:** That is fine as an answer, and thank you. It is very useful.
Lord Soley: I have a brief question. Is there more that the UK could or should do?

The Chairman: We are coming on to that.

Dr Martin Sommerkorn: Perhaps I may make a brief further comment about the working groups. Some 20 years ago they were set up for conservation purposes, protection of the environment and then sustainable development. In the 21st century, what we probably need is different working groups. It is now really important to integrate the working groups and establish processes between them so that they can deal with the issues of our time.

Q247 Lord Tugendhat: How does your organisation work with the indigenous communities of the Arctic? Is there a great difference between the work that you do with these communities in, say, the western countries of the Arctic on the one hand and Russia on the other? Can you also say a word about how these relationships have changed over the past few years?

Dr Martin Sommerkorn: Our relationships with indigenous peoples have grown over the past 20 years, and I would say that recently there has been quite a bit of co-operation as we come to realise that there are some things we agree about and perhaps can work on together. This is happening even at the level of pan-Arctic organisations like the Permanent Participant organisations of the Arctic Council. Their work is not officially funded by the council. They are granted participation and a voice, but they lack the funds to do that. The WWF, along with the Arctic Council, has stimulated moves towards the building of a Permanent Participant fund, an engagement fund that would allow them to follow up on the responsibilities and opportunities presented at the level of the Arctic Council. To that end, we would ask the observer nations to contribute to the fund too.

At the local level, for a long time we have seen good co-operation on conservation-enabling efforts, particularly through our small offices in the Canadian Arctic. But throughout all this
we have been fighting, especially at the organisational level of the indigenous peoples, against being thrown into an animal protection bucket where we do not want to be and that does not fit with our work programme.

What we are interested in is the sustainable use of Arctic biodiversity. We are interested in viable populations, and as long as that is guaranteed, we do not interfere with or set up policies on hunting and so on. I think that this misperception has been cleared up a great deal over the past decade, although you can still find people who will not engage with us. We have always had huge success in engaging with indigenous peoples in Russia, and that has been the core of the programme for a long time. One place where we are currently making the greatest progress, because the situation was not good until a couple of years ago, is in Greenland. We now have a strong work programme in place which offers WWF’s capacity to deal with local issues, or at least to help and assist with them.

Viscount Hanworth: The Norwegian Sami people have told us that they have insufficient funds to participate fully in the Arctic Council, and they seem to be in a good place relative to others, so I think that your point is well taken.

Lord Addington: I was, as I said, in Reykjavik over the weekend, and there seemed to be a greater level of engagement with the indigenous peoples we saw there. What would you say is needed in order to bring them on towards talking to you? What is the tipping point? I ask that having spoken to Greenpeace about its very poor relationships. What is the difference for you?

Dr Martin Sommerkorn: The difference lies in us being able to be understood and our putting ourselves across as an organisation that is interested in nature for the benefit of people. Once that is understood, we have a solid basis on which to co-operate. We did not make those mistakes in the past, and specifically not in the Arctic where we have never said
that certain practices like seal and polar bear hunting are bad *per se*. We are simply interested in viable populations so that such use can continue. While that will produce clashes at certain points, we always try to be at the table in order to negotiate these issues.

**Q248 Lord Hannay of Chiswick:** I wonder if we could now look at the EU ban on the import of seal products. First, what has the effect of the ban been on the population of Arctic seals and on fisheries in Arctic waters? Secondly—this is really quite a different question—do the exemptions within the ban that were designed to favour the indigenous peoples and allow them to carry on some economic activity with seal products actually work in practice? In answering that question, if you have any evidence of your own as opposed to what the indigenous peoples or their representatives say, which may to some extent be a little biased, would you set that out for us?

**Rod Downie:** I will pick up on that, although it very much builds on what Martin has been saying. Our position on the seal ban is that we respect the diversity of experience associated with wildlife and with hunting. That can be seen at the individual level, the cultural level and the national level. As Martin said, we recognise that in some areas of the Arctic, the hunting of seals is an important part of the local economy, culture and heritage. We are a conservation organisation, so we are concerned with the impacts of human activity at the conservation level and in terms of populations. Currently, we believe that the hunting of seals in the Arctic is sustainable and has no impact at the conservation level, and so really does not require any further regulation.

On the impact on indigenous peoples, which you also asked about, I certainly would not evade the question. The WWF works closely with indigenous peoples wherever it is possible to do so, but we do not view ourselves as being experts in indigenous issues. I understand
that the Committee is to hear directly from representatives of the Inuit in a later session, which will provide a great opportunity to hear their views at first hand.

**Lord Hannay of Chiswick:** Would it be unfair to say that your views have changed quite sharply over time, and that when the ban was first introduced you were rather strongly in favour of it? However, from the evidence you have just given, you are trying to detach yourselves from any question of advocacy in this matter.

**Rod Downie:** As far as I understand it, the WWF has never expressed a strong opinion on the issue. We have not changed our position.

**Lord Hannay of Chiswick:** I see, so it was other organisations that campaigned so vigorously, and you were never involved in that.

**Rod Downie:** That is correct.

**Lord Soley:** I have been struck in the past by the WWF’s position on the whaling ban. Is this part of the problem that you have with Iceland? As has been said, you do not have an office in Iceland, and I am puzzled as to why that is. Is it anything to do with the view of Icelanders about the banning of certain activities, or is it about something entirely different?

**Dr Martin Sommerkorn:** I will take the second question first. I would not know whether that is a reason for it. I have been with the WWF for the past six and a half years and I have not heard that mentioned as a reason for us not having an office in Iceland. However, we are of course active at the International Whaling Commission, where we are working towards adequate population levels among the endangered species.

**Lord Soley:** What is your interpretation of why you do not have an office in Iceland?

**The Chairman:** We already covered that at the beginning of the session. Because of the time, I think that we must move on to the UK aspects.
Q249 Lord Addington: What assessment has the WWF made of the UK Government’s Arctic policy framework? What should the UK Government be doing post-framework in relation to the Arctic? Lastly, what role should they seek to play under the US chairmanship of the Arctic Council?

Rod Downie: I will take those three questions. First, it is important to state that we welcomed the release of the UK’s Arctic policy framework as a fairly modest and tentative first step by the UK Government towards establishing a clear and transparent policy on UK activity in the region. Indeed, we worked with the polar regions unit and other government departments on the development of the policy. It contains some important guiding principles that include taking action to limit global climate change, promoting good governance of the Arctic through the existing fora, promoting the conservation and sustainable use of Arctic biodiversity, and respecting the interests of the indigenous peoples. These are principles, of course, so the proof of the pudding will lie in what action is taken.

One positive example I can give is that in their Arctic policy, the UK Government have committed to taking a leadership role at the International Maritime Organization Polar Code discussions. Three or four weeks ago I attended a meeting of the Marine Environment Protection Committee and it was great to see the UK chairing the Polar Code working group. So I hope that there is some substance there. However, as we have already touched upon, we were a little concerned that, through the policy framework, the Government are continuing to look at the Arctic for fossil fuels and energy security. For reasons that Martin has already discussed, we have some concerns about this.

On what the UK should be doing post production of the framework, we have three very immediate recommendations to make. The first is to commit to continuous improvement in UK Arctic policy. It is important that this is done on a regular basis, and we have suggested
that it should be every two years, although clearly that is open to discussion. It should be noted that both the Arctic and the Arctic Council are evolving and changing rapidly, so a thorough review is needed. The second and perhaps the most important recommendation is that we would like to see a plan of action from the UK Government for better engagement across the Arctic Council working groups. It should look at how they are going to deliver these important principles through action within the council. The third recommendation made in our written evidence is that we would like to see the UK Government sharing their Arctic policy and the experience of developing it in stakeholder engagement with other nations that have emerging interests in the Arctic. I am thinking particularly of China, which we know is currently developing its policy, India, Malaysia and Singapore, and the EU. That is really fundamental.

The Chairman: Is the UK pulling its weight? Are we doing what we should be doing and are we participating enough?

Dr Martin Sommerkorn: I will make one comment on that and link it to the remarks I made earlier about the participation of observer nations in the Arctic Council working groups. Having been based in research in this country for five years, I think there is actually an under-representation of the knowledge that is produced here in the UK in Arctic Council working groups. A more active role there would certainly be welcomed by the Arctic nations.

Lord Hunt of Chesterton: The UK is pretty good on safety, but it is pretty damn bad on pollution in the Arctic. I have heard other people talk about that this week. The UK is not pulling its weight at the IMO to reduce pollutants from shipping, although we know that shipping in the Arctic will increase. Have you raised this issue at meetings in the IMO?

Rod Downie: We have certainly raised the whole issue of ocean stewardship and marine environmental protection with the UK Government, because it is critical. I agree that that is
one area where the UK is not pulling its weight, particularly within PAME, the working group on the Protection of the Arctic Marine Environment. The UK has a fantastic wealth of experience in pollution prevention and control in this country. I am thinking in particular of Oil Spill Response Limited, which is based in Southampton. The company is the world’s largest spill responder. The UK is not currently engaging in the whole issue of oil spill preparedness and response through the Emergency Prevention, Preparedness and Response working group, so there is certainly room for improvement.

The Chairman: Thank you both very much indeed for the evidence you have given the Committee this morning. I will now bring the session to an end.