



HOUSE OF LORDS

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Witness: Dame Sue Ion

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Members present

Earl of Selborne (Chairman)
Lord Dixon-Smith
Lord Hennessy of Nympsfield
Lord Jenkin of Roding
Lord Oxburgh
Lord Patel
Lord Peston
Lord Rees of Ludlow
Baroness Sharp of Guildford
Lord Wade of Chorlton

Examination of Witness

Dame Sue Ion, Chair, Nuclear Innovation and Research Advisory Board

Q1 The Chairman: Welcome back, Dame Sue. We are delighted that you have been able to join us again. I think you will know that since we produced our report on nuclear R&D capabilities in November 2011 we have kept an interest in the subject, and indeed a year ago Professor David MacKay, the DECC Chief Scientific Adviser, gave us helpful information. We failed to get the Minister on that occasion but he came back in December and we were able to congratulate him on your appointment then to chair the NIRAB. We had asked for an independent chair of a permanent committee on nuclear research. Although we may have to explore what is meant by “permanent”, nevertheless we are very pleased that you are chairing NIRAB and it appears to be fulfilling the role that we had in mind, so we will be exploring that today.

First, as we are on the record perhaps it would be as well if you introduced yourself. If you would like to make an introductory statement, please do so.

Dame Sue Ion: Thank you very much. I am Dame Sue Ion and I am the independent chair of the Nuclear Innovation and Research Advisory Board for the Government. I do not have any opening statement.

The Chairman: You would like to go straight into the questions. As I indicated just now, I think what we are particularly interested to hear is how NIRAB, which must have met three times since you were set up in January, sees itself fulfilling its role in advising Ministers and others. Perhaps you could give us a progress report.

Dame Sue Ion: Yes, I will do my best to do that. Clearly, having met only three times and the first meeting was an introductory meeting, a catch-up meeting for most of the members, most of the work has been done between that first meeting and the meeting last week. What I can report to you is that the board is working well and good progress has been made. It has a huge amount of goodwill behind it, with industry, academic and Government members all working well together. We have had to revert to a series of subgroups to do quite a lot of the detailed work because, with the committee the size it is, it is quite difficult to consider actions and have very detailed discussions during the course of the meetings themselves.

What we have tried to do is enable some high-level objectives that were articulated in the nuclear industry strategy to be underpinned with what we hope are sensible proposals. We have worked up some early recommendations that were in what we would call the interim report to the Low Carbon Innovation Co-ordination Group at the end of our meeting last week and we will be producing a detailed report for submission to Ministers early in 2015.

Our first meeting focused on a number of things: first, agreeing the terms of reference—and I understand the clerk to the committee has forwarded you a copy of those—and then sharing information from the current landscape, both public and private, to establish a starting point and to update the baseline position that was arrived at at the close of the Beddington review after your report. It is very difficult to establish that landscape because it is much more complicated and difficult than it was, say, 20 years ago when the number of institutions was much smaller. The industrial landscape is particularly difficult to get to grips

with in terms of who is funding what and why, so it has taken us a while to try to get a picture. We aim to develop that landscape, agree an approach on the high level priorities—we did that through subgroups—and then advise the Ministers and the Government departments on any issues related to nuclear research and innovation. We have to oversee a regular review of that landscape and we will be doing that on an annualised basis to try to improve the situation that we have at the moment.

Our terms of reference are to support—I would say, rather, advocate—the development of new specific areas of research and innovation programmes to underpin the national strategy and to try to foster greater co-operation and co-ordination across the whole of that landscape. We have a small dedicated secretariat to help us gather that and NIRO—as they are called—has four staff to act as a secretariat and to be the body that is the repository of that R&D landscape. We also have an objective to oversee the development of an international engagement strategy, both bilateral and multilateral, for nuclear research and innovation. We have not done anything towards that objective at the moment. Our initial objective was to try to identify gaps in the landscape as we saw it in order to give BIS and DECC some proposals for the Autumn Statement and to prepare for the CSR early next year. We will be coming back to the international dimension at a future meeting.

Q2 The Chairman: Thank you very much. That is very helpful. I think it would be particularly interesting to hear how you interact with some of the main players. Clearly, your membership is an important component, and we have a list of the members so we are aware of which organisations are represented. How do you interact with the Nuclear Industry Council and DECC and other Government departments?

Dame Sue Ion: NIRO has a formal relationship with DECC, which is its employing or sponsoring department, and one or other of the members of the secretariat that form NIRO attend the key meetings at which nuclear R&D is discussed within DECC, particularly the

Low Carbon Innovation Co-ordination Group. I have had meetings with DECC officials and BIS officials. With respect to the Nuclear Industry Council, although I do not have a formal seat at it, in fact I do attend when R&D forms part of its agenda. For instance, I will be at the Nuclear Industry Council tomorrow to give a report on NIRAB's recommendations as they were agreed at the meeting last week.

The Chairman: With other important interactions, who would you describe as the key players that you have to ensure you are interacting with?

Dame Sue Ion: In terms of the industry community, the academic community and the wider government community, through the establishment of subgroups what we hoped to do was to widen the stakeholder base that would have an input to the R&D portfolio. NIRAB members and a much wider constituency were present at workshops that sought to determine the detail of the academic and industrial research priorities, a working group that we called the advanced systems working group, which was a mixture of industry, academic and National Lab work but with input from a much wider constituency. We have kept a record of those interactions and that can also be made available to the Committee.

One of my concerns in setting up NIRAB was that the members are the members; they are not the totality of the UK's nuclear constituency. We were keen not to be exclusive. We were keen to make sure that we got as much input as we could, which is why we wanted the workshops and the working groups to have much wider input from both the academic and industry sides than they would have hitherto had.

Q3 The Chairman: In our original report, we laid some emphasis on the need for transparency, openness and inclusiveness—all the usual buzzwords. How do you feel that NIRAB is meeting those challenges?

Dame Sue Ion: We have been as transparent as we can in that there is no secrecy about the meetings or discussions that were held. NIRAB members are at liberty to seek input and

to share output. It is my expectation that we will seek to try to publish the minutes of the meetings and any information on a website that NIRO is looking to set up going forward.

The Chairman: You have had three meetings already. Have minutes of those meetings been published?

Dame Sue Ion: Minutes have certainly been taken and last week's were only just agreed, so they have not been formally published as yet, no.

Q4 Lord Wade of Chorlton: When we proposed this role, one of the things we had in mind is that the chairman would become a much more public-oriented figure than seems to be now in the pot, as it were. Whether it was because it was a political issue for the Government or due to other opposition, the thing did not actually get led by anybody. Do you think in your role now you will be able to fulfil that role? I am not talking about you personally; I am talking about whether you will be allowed to fulfil that role. Do you think there is an opportunity for you to become much more in the eye of the public on the development of these strategies and this energy source?

Dame Sue Ion: NIRAB is an unfunded committee, except for the usual committee expenses that are paid for the chair's attendance at committee. All the members of NIRAB are unfunded. NIRO itself is only four people strong and is funded from DECC in that respect. I can understand what you are saying, Lord Wade. I do my best in the public domain, not necessarily with a NIRAB hat on because I am limited as to the amount of time that I am allowed to allocate to NIRAB. I do my best to advocate nuclear issues on both the international and national stage in a personal capacity but not necessarily with a NIRAB hat on.

Q5 Baroness Sharp of Guildford: If we are looking at nuclear research, one of the key issues is the labour force and in particular the highly trained labour force. Is your committee taking a view on this and working with the Government? There are various measures in

hand to try to upgrade the labour force and develop new, younger scientists who have some knowledge in this area.

Dame Sue Ion: From a formal standpoint, the nuclear skills issue is not necessarily within the bandwidth of NIRAB's terms of reference. That is not to say we would not consider nuclear skills, as they are, as you point out, an important part of the overall pipeline for successful work in the future. The Nuclear Industry Council itself has a specific workstream on nuclear skills that it is overseeing and I am sure that we all pay attention to that. One of the fundamental tenets of research is a vibrant pipeline of domestically trained researchers that will be going forward into both National Lab and industry and remaining with academia, so what is more important is a vibrant R&D programme that pays for post-docs, postgrads and academic work, as well as National Lab work, in topics of importance.

Baroness Sharp of Guildford: Yes, but in terms of training people from this country as distinct from bringing them in from abroad, as you rightly say, there is a need to develop the pipeline there. It is necessary to have some basic training in order to develop that pipeline itself.

Dame Sue Ion: Some of the training is provided as a matter of course as a first base in the United Kingdom's universities. Many of the big universities now have nuclear modules within their mainstream degrees. As a nation, we have not taken the line that some nations have of teaching nuclear engineering, say, as a separate topic at undergraduate level. Most of the activity is within the normal mechanical engineering, materials, civil engineering, chemical engineering courses, with modules, and then students seek to stay on to do a master's or are sponsored by industry to do a master's. There are good courses at the universities where you would expect to see them, such as Manchester, Birmingham, Imperial and others.

Q6 Lord Jenkin of Roding: Perhaps I should declare two things. I met representatives of the National Nuclear Laboratory yesterday and I ought to declare an interest as honorary president of the National Skills Academy for Nuclear.

I think the point that Lady Sharp has raised is hugely important and this was very much stressed to me by the NNL people yesterday. They are looking for NIRAB to give a positive backing to what is going on here. The question of skills and future researchers and so on is hugely important and you are quite right that a programme that will attract able and committed people is immensely important but we need to get to the point where post-docs and postgraduates could be attracted. They are struggling to find the people to man phase 3 of the laboratory, which of course has been mothballed for a long time. I hope that NIRAB will be able to use its weight and you will be an influential body to stress the importance of this.

Dame Sue Ion: We will do our best, Lord Jenkin. At the end of the day, we are an advisory body and we hope that Government will take notice of the advice that we give. We are emphasising the need for appropriate new capital assets, which are essential to plug gaps in the UK's nuclear landscape, but more importantly programmes that will enable those assets already invested in to be utilised, like phase 3 of the National Nuclear Lab and other assets that Government has already paid for as well as programmes to support the new assets that we request. There is no point in having shiny new buildings and equipment if you do not have an effective programme of work in order to train people and allow people to become subject matter experts, respected on the international stage.

Lord Jenkin of Roding: Exactly right and we will come to that point about capital and revenue later.

Q7 Lord Rees of Ludlow: I wanted to ask about the R&D funding. The most dramatic thing that has happened in the last 20 years has been the colossal plummeting of the overall

level of R&D. What could one do to revive it, in particular by ensuring that the private sector, which is well represented on your committee, sees an obligation to supplement the public funding, as happens in the pharmaceutical industry and other industries? Can you say what can be done to ensure that the private funding is enhanced?

Dame Sue Ion: Certainly exhortation, and pleading in some instances, can be effective, but one of the issues that we face is that the gaps that we see as a committee in the R&D landscape going forward are in the areas of fuels and recycling and future systems. Most of the industry players, in terms of those gap areas, have overseas supervisory boards and very effective R&D programmes in most instances in their own nations, so the incentive for them to fund to fill the UK gaps is not as high as it would be if they were getting the same pleading from their own nations. In areas like waste management and decommissioning, it is not such an issue because the work that the NDA does and the companies with which it interacts are able to demonstrate a more balanced approach to industry funding as well as Government funding.

Lord Rees of Ludlow: Going back to what Lady Sharp was saying, if you want to send a signal to young people that there is a good career in this country, how are we going to do that? I remember we had a Minister who talked to us when we were having the original hearings who said that the UK was just going to provide a watching brief on future developments. That is supremely uninspiring to any young person choosing a career; you have to turn that around completely. I wonder if your committee can do something to do that, maybe by going more public and having a higher profile for your committee, talking to the press and so on, to raise the importance of this issue for the long-term future.

Dame Sue Ion: I am hoping, Lord Rees, that some of the topics that we have put on the agenda for priority funding, like accident-tolerant fuels for instance, will be things that would be attractive to a future generation of researchers but also as an important step forward for

the UK to play a niche role internationally and to create jobs and wealth in an important area for the sector.

One of the issues that we have is residual uncertainty about nuclear energy's role going forward. We all have high hopes of Hinkley Point and the first phase of new power stations but we have waited a long time for those. Students are sensible people and they look for where there is vibrancy and jobs growth. Until we actually see mobilisation properly of the new build phase in the UK, students are reluctant to tie their careers to an industry that has not yet moved but almost certainly is going to; certainty in the nuclear landscape that not only are we going for a first phase of nuclear reactors but that we do intend to pursue the nuclear industry strategy as articulated, that we intend to have nuclear energy as part of the portfolio for the long term and that we intend to keep options open for the long term.

Lord Rees of Ludlow: Even if the process of Hinkley and so on does move ahead, given that the major companies are not UK owned and controlled, do you think that is going to improve the situation very much?

Dame Sue Ion: Yes, I think it will because there are significant opportunities for the UK supply chain within the three systems that are to be deployed. There are discussions about small modular reactors, which may or may not proceed. There is just a general greater vibrancy within the academic world in terms of challenging topics being researched and greater numbers of academics being appointed to many of our universities. I am generally optimistic on that front and students will come where there is good work to do, so it is the programmatic money that we want to enable these good endeavours to proceed.

Q8 Lord Oxburgh: I am declaring a possible interest as president of the Institute of Measurement and Control and as director of several small renewable energy companies.

I have various questions, some of which follow on from the discussions that we have had. My reading of the NIC minutes and its terms of reference was that the Government seems to have put a public perception duty on the NIC. Is that your view as well?

Dame Sue Ion: I do not think it means that the Government itself does not have a responsibility for public perception on matters nuclear. I am sure that it would wish industry members to play a full role in that, but I do not think it removes the basic responsibility from Government to make sure that there is proper information out there on which the public can make sensible decisions.

Lord Oxburgh: I am sure that is right and there was discussion of the various good museum-type exhibits that there had been and there used to be at Sellafield. Unfortunately, that has gone. Let us talk a little bit about the way that NIRAB works. Do you find you have good access to Ministers? Where are your contact points?

Dame Sue Ion: My key contact points would be the sponsoring officials in DECC and BIS, but DECC formally. The reports that come from NIRAB, which I would author on behalf of NIRAB, will go straight to Ministers. There will be a report going to Ministers from last week's meeting. We do the courtesy of making sure that the NIC has seen it—it would not be changed in the light of what NIC might say, but it would be helpful to have the NIC see it before it goes—and then it goes direct to the Ministers of State. I was due to meet Mr Willetts tomorrow after the NIC, but I understand that two Ministers who were relevant to NIRAB's activities will have moved to other opportunities, so we will wait and see who the lead Ministers are.

To answer your question, Lord Oxburgh, if I felt it necessary to see a Minister on any matter associated with NIRAB, I do not think I would have any problem in getting to see him or her.

Q9 Lord Oxburgh: Thank you very much indeed. First of all, let me say that the whole co-ordination scene of nuclear activities is just immeasurably better through the existence of your group than it was previously, but that does not mean that there is not a big challenge, as you touched on in your introductory remarks. You have work done by research councils, universities, Technology Strategy Board, NNL and so on—you have emphasised the difficulty in getting a full picture here—but how does the NDA come into this?

Dame Sue Ion: The NDA has a seat on NIRAB. I discussed with the chair of the NDA research board the importance of making sure that the two committees operated in synergy and that the NDA committee would do its best to make sure that what it was overseeing and looking after in terms of the NDA remit would not duplicate what we were doing and would hopefully build synergies between the two committees. That is not to say that, downstream, NIRAB will not take a look at the NDA's overall research portfolio. It is just that we elected to seek first where the gaps in the UK's landscape were rather than to try to look to improve efficiency across the totality of the landscape, which I am sure we will try to do going forward.

Lord Oxburgh: Fine. That deals with that. As Lord Jenkin pointed out, one of our concerns was the relatively low level of funding for nuclear research. How do you see the role of NIRAB in this area in future? First of all, there is the funding for your activities. I think you have £700,000 that expires in spring of next year and, as you say, that supports a staff of four, which is not a lot to cover the whole canvas that concerns you. I gather that that roughly £700,000 is split more or less evenly between BIS and DECC. Are you content with that level of support? Do you feel able to ask for more support if necessary? Then at a later phase you are going to be making recommendations to Government in different areas for a whole range of activities, from international collaboration to particular research facilities or research activities in the UK. You are going to have to put price tags on those and effectively

advise Ministers of Government what is good value for money and suggest prioritisation. Are you confident that you can do that as things stand?

Dame Sue Ion: I would not want to understate the challenge. Let us deal with the two things separately. One is the secretariat support in determining what we do. NIRAB's job is to advise Government on what needs to be done and why, and hence what it is going to cost. It is not NIRAB's job to do that work itself or to dispense the money. We have no money to give away to anybody because it is not within our gift. The secretariat support—in the four very able people, led by a chief executive, who we have—has been good enough to date to try to get to grips with the totality of the landscape. It may well be that, on review, we decide that we need more in order to do a better job on giving Government visibility and transparency across the totality of the landscape. I do not know the answer to that.

The £700,000 that you mentioned was split over two years, so the monies for this year I think were £450,000, something like that, and that is purely staff costs for the four people concerned and the other overheads that a committee has through renting places for workshops, bringing together people and that sort of thing. It is a relatively minimalistic amount and so I would argue exceptionally good value for DECC and BIS, given that the rest of the committee's work is free and goodwill. I think they get extremely good value for the investment that they are currently making in that.

When it comes to the monies sought, I think it was Lord Rees who pointed out that the Government funding for research and development, outwith that that falls within the NDA battery, has been driven to a very low level, with the exception of small amounts from the research councils for the advanced systems work and participation in international matters. Outside of waste management and decommissioning, which you would expect to be hopefully well funded, the rest has been rather poorly considered. Going from a very poor situation to a much better situation takes time. It would not be value for money to just

throw a vast sum of money at it now. It has to be grown properly on the back of assets that we already have or would like to have and on the back of building a programme in priority areas.

The sort of monies that we are asking for are of the order of up to £200 million over the next CSR, which would be a programmatic element of about £30 million per year to pay for researchers to work on nuclear topics, from the academic landscape all the way through to National Lab and some co-sponsored industry work. We determined that sum independently, but it happens to coincide with the sort of monies that were proposed by those who participated in John Beddington's review.

Q10 Lord Peston: I must confess I am still a little lost as to what NIRAB actually is supposed to do or actually does. Following Lord Oxburgh, I am not very clear whether your role includes advising on the total sum of money that should be devoted to nuclear research.

Dame Sue Ion: Yes, it does.

Lord Peston: Are you allowed to say that the Government are not spending remotely enough money on it?

Dame Sue Ion: I am allowed to say that, yes.

Lord Peston: You are allowed to say that and that is quite different from what your own budget is about.

Dame Sue Ion: Yes, because NIRAB itself does not have a budget. It is there as an advisory body to advise Government on what R&D should be funded and why without boundary in the UK's landscape but, as I indicated, we have not yet looked at the R&D element of the NDA's boundary limits because we wanted to identify as a first step priority areas that were currently unfunded. Unless they are funded, the Government does not have a hope of fulfilling the national nuclear strategy that it published last year.

Lord Peston: Let me take a specific example. Ever since I was interested in the economics of electricity power generation, we have talked about fusion and the one thing I have discovered is that if you get into the fusion game you are talking about limitless amounts of spending. We are always being promised we are going to crack that one day but it is always “one day”. Is this a matter that is relevant to what you are supposed to do? In other words, is it within your remit to say either you commit yourself to spending limitless and unpredictable amounts of money on fusion or forget about fusion? There is no way anybody has yet got anywhere near cracking the problem.

Dame Sue Ion: NIRAB’s remit does not include scrutiny of the budget on fusion.

Lord Peston: The word "fusion" appears somewhere in the documentation.

Dame Sue Ion: That is true, Lord Peston, but what NIRAB does do is seek to try to make sure that we capitalise on wherever there is synergy possible between fission and fusion. When you look at some of the detailed physics, chemistry, engineering associated with fusion, some of the fundamentals on things like materials and robotics are common to both missions, and so NIRAB’s role is to try to make sure that wherever there is synergy to be gained we seek it out.

Lord Rees of Ludlow: As a quick follow-up comment, to outsiders it does seem extraordinary that the £30 million a year you said are needed could not be provided somehow, given that it is only 1% of what is being spent every year on cleaning up Sellafield, that in the context of that huge sum it is so hard to find this £30 million a year. Would you agree that it is hard, and can we do anything about it?

Dame Sue Ion: I would agree that I think what we are asking for is a sensible, modest, value-for-money amount and I would be extremely disappointed if the departments of state did not agree that that money was appropriate for the nuclear mission and to deliver their own strategy. For further clarification, Lord Rees, I would not like people to think that £30

million is the top line. It is a first stab at what we have to do on what we believe to be an essential journey to regain a sensible position on nuclear R&D in the UK. It is a first step along a journey that could lead to larger sums.

Lord Rees of Ludlow: I wanted to follow up on the international side. You said that your committee had not yet got round to doing very much on the international side, but the Ad Hoc Committee, as you know, recommended that you should develop an international strategy. This involves a plan for involvement in Euratom, getting back into the Generation IV International Forum, exploring the potential for collaboration on small modular reactors and all these things. Would you like to comment on how quickly you think this will develop and how important it is to develop these international links and get back into these long-term projects, which are quite inspiring?

Dame Sue Ion: Yes, indeed. That is one of the areas where the modest amount of funds does not always play to our advantage because other nations that have much bigger programmes—the United States, France, China, to name but three—obviously have very significant hundreds of millions going into their nuclear research landscape. But we have engaged, albeit on a first-time basis, with the CEA in France and the United States Department of Energy to look at areas where there will be scope for the sort of areas that NIRAB is recommending, like accident tolerant fuels, modelling and simulation, actinide chemistry, fast reactors and small modular reactors. We have sought to look at areas where they would find the UK's expertise particularly attractive and we will be developing those in future months and years.

The important thing is to collaborate, not to compete. There is no point in doing exactly the same as what other people are doing, because it is not good value. The important thing is to show where the UK has niche excellence and where we can really add value in these international endeavours, and I have no doubt that we will have a good position in

Generation IV going forward. We already do have a good position on quite a lot of the waste management and decommissioning, so most of my reservations are about the areas that are not waste management and decommissioning, where we are well funded and we have internationally credible expertise. The National Nuclear Lab has already developed over time good relationships with some of the USDE labs and the CEA in France on a bilateral basis but with only modest investment.

Euratom is an interesting one. I chair the Euratom science and technology committee and DECC officials are the UK representatives on the committees that determine the research priorities under Horizon 2020, which is the forthcoming programme. On the advanced reactors and future systems, Euratom spend in those areas is tiny in the overall scheme of things. It is single million spread right across the whole of the member states. That is because for Euratom research it is not a majority vote—it is a unanimous vote—and there are some nation states that would not wish to see the nuclear agenda taken forward other than in areas associated with safety, waste management and decommissioning and radiological protection, so it is in those areas where we would seek to gain maximum synergy. With respect to advanced systems, while we will be properly engaged with Euratom, the amount of money that Euratom has to dispense will not be that meaningful in a UK context.

Lord Rees of Ludlow: Do you directly advise the BIS officials or DECC officials who go to these meetings wearing another hat?

Dame Sue Ion: I do not. I do not know for sure; I assume it is the National Nuclear Lab and members of the academic community that advise the DECC officials in that respect.

Q11 Lord Hennessy of Nympsfield: Dame Sue, listening to you a number of times this morning I have seen the wraiths of the past and heard echoes of the past: when you said the nuclear industry has not yet moved but is almost certain to do so; for Government to have a

hope of implementing its national nuclear strategy it will have to do this; and you talked about the essential journey to regain a position on nuclear R&D in the world. I can remember as a boy “too cheap to meter” nuclear-generated electricity; the Queen on the Movietone in the cinema pulling the lever to get the first civil electricity from Calder Hall into the grid; Reggie Maudling, the Minister of Fuel and Power, in the ruins of Suez saying, “If we cannot boast about our civil nuclear programme, what can we boast about?” I have every sympathy with what you are doing, but to regain a serious position of a primacy lost through a series of well intentioned but huge misjudgments, I think it is fair to say, what do we need to do to be a big player again? Can you sum it up? If I was Prime Minister—a post to which I have never aspired—and I said to you, “Give me a strategy to do that”, what would be the essential ingredients?

Dame Sue Ion: That is a very challenging question. I can remember as a young student looking to join what was going to be a vibrant nuclear industry back in the days when we were having lots of PWRs before they were cancelled and the UK’s programme reduced to what we have today, but I am still optimistic and I am optimistic for us playing a better role than we do currently. We still have operational assets in the UK and only a small number of countries in the world have those. We are currently still a country that is able to reprocess on an industrial scale, and we want to keep our options open in that respect. I think we can still maintain intellectual leadership and engineering leadership in next-generation reprocessing technologies if we choose to make the investment to do so. We have an extremely good track record in that, and we are still running operational facilities with the incredible expertise that the combination of research and operating an industrial asset brings you. We still have world leading capabilities in fuel, in our academic base and in our National Lab, and they can stand with any in the world in terms of advanced next-generation fuels.

The one fortunate thing about the UK's historic programme is that we did Heinz 57—we have been there, seen it, done it and got the T-shirt for most of the things that are considered in the advanced portfolio and still have people who can remember it and are training new researchers coming up through the university base in key elements of research that keep that expertise alive. So I do not have any worries about us competing in certain areas.

With respect to reactor development, you are quite right, we chose to go down a particular road and the rest of the world went down a different road of mainly light water reactors. However, we do have an opportunity, with respect to small modular reactors, to join in the international endeavour that goes along with small modular reactors. They have potential, but it is only potential. In fact, NIRAB has considered the interim report from the feasibility study that was set in train by David Willetts before Christmas last year to advise Government on what should be done with respect to Government's role in that. The study was seeking to determine whether there is a global market, because if there is not a global market the UK's market alone is not sufficient to make these as attractive as they otherwise would be. If there is a global market, then what is the scope for UK participation with others that are already in the field to gain IP and hence a position in design and engineering, as the designs are finalised, and in manufacturing going forward? If there is not a scope and a role for the UK in that, then you might as well just open the doors and ask the vendors to appear and give you a price. But if we do determine that it is the right thing to do, then there is very significant scope for research that will underpin the deployment of those systems. It would also give our regulator a primacy role on the international stage as being the regulator that was licensing one of these first.

With reactors, small modular reactors offer potential but only if certain questions are answered. On fuels and recycling, I think we can sustain a position that would be up with the

best in the world. On waste management and decommissioning, arguably we should be the best in the world because we have one of the most challenging sites and we have a great deal of expertise that is currently doing it as well as researching it. So I am not as negative as you would be.

With respect to fast reactors, I do not see any reason why we should not be full participants in a Generation IV programme that involves fast reactors. We have expertise on the fuel side and we have aspects on other parts of the system that because of our history are valuable to international players.

Lord Hennessy of Nympsfield: Do you regret that we let Dounreay, our fast breeder, go? Do you think that was another one of these regrettable mistakes?

Dame Sue Ion: Well, no, because the Dounreay systems were set up to be experimental and demonstrator systems. In the end, they fulfilled their mission. As regards just keeping them going at what would have been a major cost to the Government purse, when there was no signal that there was any commercial deployment in the foreseeable future, at the time I could not blame the Government of the day for taking the decisions it did. What I hope is that, while there is still time to recover some of the materials that were generated in that programme, we do not inadvertently throw them away as part of the decommissioning mission, because they are incredibly valuable assets that would help us leverage our position internationally.

Lord Dixon-Smith: Listening to this as an outsider—and I am completely naive about the nuclear industry—it does seem to me that NIRAB is uniquely situated to be, as you might say, a flag-bearer for the nuclear industry, which also seems to me to be the one thing you are specifically designed, in the way you are established, not to be. That is a conflict that is beginning to tease me, shall we say. Would you like to comment?

Dame Sue Ion: We are a board that is set up to advise Government on the research landscape, not to be the advocate for nuclear energy or anything else. The Nuclear Industry Association is there as a body to promote the interests of the industry sector. I am not sure what else you would want NIRAB to be. It is there to advise Government on research, not to be marketers for UK Nuclear Inc.

Q12 Lord Rees of Ludlow: How do we maximise our chance that we really do get involved in Generation IV reactors, where the lead will be taken by foreign companies? Is it by doing more R&D upfront to strengthen our position, or is it by commercial deals? How can we ensure that some of these things do happen?

Dame Sue Ion: On the Generation IV systems, almost all of the international effort is funded by Governments of one shape or form. I hesitate to say this, but I am pretty sure there is almost no direct private sector involvement that is not paid for by a Government somewhere for the work done. So I think that the programme that is being set out to enable us to participate in Generation IV, selecting the systems where we have most to give, will get us to a position. I am not sitting with a NIRAB hat on now; this is my personal view. If, for instance, France does decide to go ahead and build its ASTRID system, then there is no reason why the UK could not seek to negotiate a good role in, say, fuel or other components where we know we have a significant amount to add. In that case, NIRAB will be coming to the Government to say, “We think the UK should be full and high participants in this international endeavour, and this is the amount we think you are going to have to pay to do it”, but we are not at that position yet.

Lord Oxburgh: Sue, would you like to talk a little bit about NNL and the relationship of NIRAB with NNL and what you expect your future relations to be?

Dame Sue Ion: NNL has a full role in NIRAB, as do the other members. NNL’s chief scientist sits on NIRAB and so, in that respect, our relationship with NNL is the same as it

would be with the academic representatives and the industry representatives. It is no different in that respect from our relationship with the Nuclear Advanced Manufacturing Research Centre where Mike Tynan has a place on NIRAB. Graham Fairhall, the NNL Chief Scientist, is the representative on NIRAB.

Lord Oxburgh: You would expect to play the same co-ordinating role involving NNL as you expect in principle may happen with TSB and the research councils and universities?

Dame Sue Ion: Yes.

Lord Oxburgh: But, on the other hand, NNL is going to be a bigger fish than most of the others. Is that not right?

Dame Sue Ion: It depends how the money flows. At the moment NNL is a body that is not able to have research council funding unless that funding is provided by the academic route for academics to work in NNL's excellent facilities. It is the same normal rules as any public sector research establishment. NNL is therefore reliant in research space on funding such as the programmatic funding that I have indicated NIRAB will be calling for. I would expect NNL to play a significant role, along with academic institutions and some industry partners too, in executing the work of the programme that we have articulated.

Lord Oxburgh: Are you satisfied that the arrangements for access to national facilities, wherever they are located but for which NNL is at least in part responsible, are adequate?

Dame Sue Ion: It is not something that we have looked at in great detail, Lord Oxburgh, but as far as I am aware the arrangements for access are open. Academics are able to make proposals to use equipment. The research councils have funded some equipment to go into NNL assets on the back of academic research by academics that will be executed within. The relationship that the National Nuclear Lab has had with the Dalton Institute at the University of Manchester has provided a portal for academic work to be done in NNL's

facilities. I am not aware that there is any particular problem, but, if there was, I am sure NIRAB would want to scrutinise it.

Q13 Lord Jenkin of Roding: Lord Oxburgh and I are only co-opted for this particular study, but this Committee did a study a little while back about scientific infrastructure generally. I took part in the debate on that Committee report and I asked the Minister at the time, “Is this going to include nuclear research?” and to everybody’s astonishment the answer came “Yes”. I do not know whether you were as astonished as everybody else seems to have been. But the question then arises, and you have referred to this already: what about the supporting revenue? As you rightly said, it is no good having shiny new equipment if you do not have the money to operate it. Can you comment on that?

Dame Sue Ion: As I indicated earlier, we think that for the programmatic work—the work to do things and to stay at the cutting edge, to be excellent, to create subject matter experts—we need that funding to be allocated as well as the capital. As part of the consultation that has taken place on the science capital roadmap, the timing was not ideal because we have not yet identified in full the capital requirements but it is commentary that we have made into BIS, DECC and the Nuclear Industry Council. We have formally said that programmatic money is vital and it is no good just saying, “We have provided X and Y capital”, because that will not do it.

Lord Jenkin of Roding: A few days ago, I raised this again when there was a Question in the House about science spending generally and happily it was the same Minister who had given the earlier approach who was answering the Question. I reminded him of the answer and I said, “What is the point of spending large sums on capital if you do not have the money to do it?” Lord Ahmad of Wimbledon replied, “He mentioned nuclear in the Grand Committee and part of the thematic priorities within that are energy and how the challenges of a secure, affordable and sustainable energy sector can be maintained. The issues my noble

friend raises about sustainability are primary” in that dialogue. He did not really answer my question. Have you any confidence that this is now going to be taken forward in the CSR, in the autumn and then beyond that, as they said, up to 2020 and beyond?

Dame Sue Ion: I certainly hope so, Lord Jenkin. Confidence is perhaps too extreme in terms of the right end of the spectrum. I have hopes that programmatic money will be made available and I will wait and see, as I am sure your Lordships will. Without that programmatic money, we will struggle to improve on the situation that we have now and we will certainly fail to deliver the nuclear industry strategy for the nation.

Lord Jenkin of Roding: So it is absolutely crucial to NIRAB’s future role?

Dame Sue Ion: It is.

Lord Wade of Chorlton: Can the advice you give to the Government be made public?

Dame Sue Ion: I do not see any reason why not.

Lord Wade of Chorlton: That might be one way for your ideas to be able to get across more to the general public.

Dame Sue Ion: The honest answer is that I do not know, but I personally do not see any reason why not.

Lord Wade of Chorlton: All you have to do is have a good relationship with a journalist you trust. That is another matter.

The Chairman: Are there any other questions any of my colleagues would like to ask? We have an unparalleled opportunity to ask Dame Sue further questions.

Q14 Lord Rees of Ludlow: I would like to go back to Sellafield and the huge cost of the clean-up. Is that within your remit to advise on? That is a disastrous legacy, where we have heard that the expenditure may rise to £100 billion over the rest of this century and if that is really true this is casting a whole blight over people’s perception of the future of nuclear. Do

you have any comments on this and do you see any way in which better R&D could somehow bring down these costs?

Dame Sue Ion: As I indicated, our remit is associated with innovation, research and development and we have not exercised any scrutiny on the area that is covered by the NDA as yet, although we may well do in future. From my personal view therefore—rather than NIRAB's view, as we have not yet considered it—I am sure that there is a scope for innovation to make a difference. One of the issues that I am sure other people will look at with respect to the relationship at Sellafield is that the NDA can put pressure on the managing contractors of the site to be funding the right R&D. However, the money that is directly within the NDA's own gift is relatively modest. I think what is of greater interest is how exactly Sellafield's management will be taken forward and the role that innovation will play in improving the situation with respect to the clean-up bill. It is not something that NIRAB would look at directly but certainly we will scrutinise the research aspects of it.

Q15 Lord Jenkin of Roding: Dame Sue, we are lucky to have you in front of us because you are free to express your personal view as well as a NIRAB view, and I quite understand that NIRAB has not considered this thing. I have already suggested that the Committee might do well to have a short study of what is happening with the whole of this decommissioning programme and particularly the Sellafield clean-up. It has been represented to me that there are very considerable problems, both for the NDA and Sellafield Limited, as well as the Nuclear Management Partners.

Dame Sue Ion: It is a reasonable question to ask, Lord Jenkin, but I honestly do not think that NIRAB is the right body to do that.

Lord Jenkin of Roding: No, I was asking your personal view. Are we entitled to do that?

The Chairman: You have every right not to answer.

Dame Sue Ion: I did provide some input to a previous review that was undertaken by the National Audit Office in my capacity as a fellow of the Royal Academy of Engineering, so if you read the National Audit Office's views about Sellafield and the issues then I think you will find that what they said mirror my own.

Lord Jenkin of Roding: They were very critical, and of course that was picked up by the Public Accounts Committee in the other place. Nevertheless, the same consortium was reappointed to do this.

The Chairman: Lord Jenkin, as you heard, has suggested that we look at this on a future occasion. While we have not committed ourselves to it, we have certainly taken note of his suggestion.

Q16 Lord Patel: Listening to the discussion that has been going on, what is not in NIRAB's remit that you wish were that would make your advisory role more effective?

Dame Sue Ion: To be honest, I think we have got a pretty wide remit. It may be that, on further reflection and as we scrutinise the landscape in more detail, there is something that crops up where I wish it was within the remit, in which case I would probably ask for it, but as we speak today I do not think that there is anything that I could tell you that I wished was within the remit.

Just building on Lord Patel's question, I think that this is not something within the remit per se but it is sort of related to the questions that Baroness Sharp and Lord Oxburgh asked about the skills and the National Lab. One of the things it is important to note, particularly now with the National Lab's status as a GOGO—a government-owned, government-operated business—is that it is a key public sector research establishment in the national space and it is very important that it is treated as such and that it receives appropriate scrutiny and is appropriately funded in that respect. If it is truly the National Nuclear

Laboratory, then it should be able to receive money from the departments of state for providing them with expert advice. That is the way it would work in most other countries.

The Chairman: I think we are coming to a conclusion of what has been a most illuminating and helpful discussion.

Dame Sue Ion: I have just one final comment. You very kindly invited me here today to update you. I feel I should point out that NIRAB and NIRO were set up and NIRO is funded until March 2015 and my role as committee chair is until March 2015. I will leave that with you.

The Chairman: I did earlier note that we suggested there should be a permanent committee and we do not yet have a permanent committee. We have taken note of that and clearly that is an issue that remains to be resolved and not in your gift at the moment.

When we did the original report in November 2011 on nuclear R&D capabilities, it was a pretty dire situation. I am not saying that everything has improved out of recognition but the fact that there is now NIRAB, with you as an independent chair, does mean that the research landscape looks as though it has some cohesion, and we wish you well. Thank you very much for all you have done today to help tell us of the progress you are making and will be making in future. Thank you.