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Witnesses: Duarte Figueira, Rt Hon Lord Smith of Finsbury, Dr Tony Grayling and Peter Baker

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Members present

Lord MacGregor of Pulham Market (Chairman)
Baroness Blackstone
Lord Griffiths of Fforestfach
Lord Hollick
Lord Lawson of Blaby
Lord Lipsey
Lord McFall of Alcluith
Lord May of Oxford
Baroness Noakes
Lord Rowe-Beddoe
Lord Shipley
Lord Skidelsky
Lord Smith of Clifton

Examination of Witnesses

Duarte Figueira, Director, Office of Unconventional Gas & Oil, Department of Energy and Climate Change, **Rt Hon Lord Smith of Finsbury**, Chairman, Environment Agency, **Dr Tony Grayling**, Head of Climate Change and Communities, Environment Agency, and **Peter Baker**, Director, Hazardous Installations Directorate, Health and Safety Executive

Q153 The Chairman: Mr Baker, Mr Figueira, Lord Smith and Dr Grayling, thank you very much indeed for coming. This is the ninth public hearing of our inquiry into the economic impact on UK energy policy of shale gas and oil. I would be grateful if those of you who have not appeared before a Select Committee before would speak loudly and clearly for the benefit of the webcast and the shorthand writer. Also, although our questions are to all of you, if you agree with what has been said by whoever speaks first or second, simply nod and I will record that for the transcript; that is fine. Do not feel you have to answer every question. Thank you very much indeed for coming, and thank you in particular to you, Mr Figueira, for your written evidence, which has been very helpful. Would anyone like to make an opening statement, or shall we go straight on? Well, perhaps I can begin by saying that the background for this particular session is that everyone that we have had evidence

from so far has agreed that stringent tests need to be carried out on all the various aspects of risk, including environmental. Some have assured us that the UK has a good—indeed, some said it was one of the most stringent—regulatory system, and we would like to probe that with you today. This is the background for this session, which we regard as a very important session for us, and it is these issues we wish to explore with you. Can I begin with a fairly straightforward question, just to set the scene? Could each of you outline the regulatory framework under which shale gas exploration and development takes place in the UK, and in particular refer to your respective roles?

Duarte Figueira: What I would like to do is to first of all lead off for DECC and explain what DECC does in the process, because, in a sense, DECC starts the process off. I will also cover the planning aspect, because we do not have anybody here from DCLG, who lead on planning policy for England.

The Chairman: We are having the Secretary of State in due course.

Duarte Figueira: Okay, but I will incorporate that into the overall description of the process, and then I will say a little bit about DECC, because DECC comes back into the process at the end, when the final drilling consent is given. Then I will invite my colleagues from EA and HSE to detail their parts of the process.

The process for obtaining a consent to drill a well is the same whether or not it is a conventional or an unconventional target. That is the first point to make. What happens is that DECC issues licences in competitive offerings—in licence rounds—that grant exclusivity to operators in a particular licence area, but they do not give any rights, or consents, to drilling per se. This is not done, in any case, by OUGO; it is done by the licensing part of DECC. When an operator wishes to drill an exploration well, their first step, therefore, once they have got the licence, is to negotiate access with the landowner, and they must also obtain permission from the Coal Authority if their proposed exploration is going to

encroach on a coal seam. The next step for the operator is to seek planning permission from the mineral planning authority, which in England is largely done by county councils or unitary authorities, and they will determine whether or not an environmental impact assessment is required. That is based on various thresholds that have to be met—whether or not the exploration will have a significant environmental impact. That is the first stage of the process: we issue a licence and, after a negotiation with the landowner, the company approaches the mineral planning authority. At this point, I will pass over to my colleagues from the Environment Agency and HSE.

Lord Smith of Finsbury: Thank you. We are the environmental regulator. That means that we look at those aspects of any drilling operation for mineral extraction that have an impact on the environment. In relation to shale gas exploration, we manage the use of water, the protection of ground and surface waters, and the management of wastes such as drilling muds, flowback fluid, gases and naturally occurring radioactive materials. If a significant or actual risk becomes apparent, we have the authority to stop the activity, but we would make a very clear assessment of the protections that the drilling company has in place, and, on the basis of those protections, we would issue permits. The range of permits required will vary from site to site. There will be some sites, for example, where there is no danger whatever of an impact on groundwater, so a groundwater permit might not be required. The range of permits that would be potentially required includes environmental permits for mining-waste activity, for radioactive-substances activity, potentially for groundwater activity, potentially for water-discharge activity, and potentially for industrial emissions. There would also be water abstraction consents required, because at the time of fracking a substantial quantity of water is required. Depending on location, there might be a flood-defence consent required as well. All of those are very specifically potential environmental impacts.

Peter Baker: The Health and Safety Executive is the health and safety regulator in Great Britain for all work-related activities. That includes activities involving shale gas. Our role is principally to make sure that employers and operators of shale gas activities are adequately managing and controlling those safety risks associated with those activities, which may affect the workers on the shale gas site, contractors working on the site, and also members of the public who may be affected by those work activities. For shale gas operations, our focus is on ensuring that the shale gas wells themselves are properly designed, constructed, operated, maintained and, ultimately, decommissioned. The principal process safety hazard associated with shale gas is an uncontrolled release of pressurised hydrocarbons and other pressurised fluids involved in the process, so the regulatory regime around that hazard is focused on containing the pressurised gas and other materials within the well itself.

On top of the Health and Safety at Work Act, which is of general application, there are two specific sets of legislation that are aimed at controlling well design, well control and well operations. One is the Borehole Sites and Operations Regulations, which date back to 1995, which require operators of sites to notify the HSE of a proposed well operation. The other is the Offshore Installation and Wells (Design and Construction etc) Regulations, which set out specific requirements for the standards associated with wells and also the safety regimes—inspection regimes—that are necessary throughout the lifecycle of the well operation.

HSE's role is principally in two broad areas. One is more generally engaging with the industry, with colleagues from DECC, the Environment Agency and other agencies, in encouraging and supporting the development of technical guidance and technical approaches that underpin the statutory requirements. The other is independently inspecting and regulating the well operations themselves. We receive the well notifications, which will include the operator's safety assessments and emergency arrangements, and we will assess

those before the operations take place. Once the operations are up and running, we will conduct inspections: principally, initially, before the operations take place, and then throughout the lifecycle of the well operations. Operators are also required to send us weekly operations reports on how the operations are going in accordance with their original design specifications, which we then scrutinise and can take action on as appropriate.

Duarte Figueira: Perhaps I can just conclude, Chair, by saying that DECC will then check that the Environment Agency—or the devolved equivalents, SEPA and the NRW—and HSE have no objections before consenting to drilling operations ourselves. If hydraulic fracturing is intended, then DECC will require a fracturing plan to address the risk of induced seismicity, and this will be submitted and reviewed before the operations are permitted. If the operator wishes to drill an appraisal well following exploration or to do production, then they will start again through the process that has been described to you by the witnesses.

I should say that all of this is done from the licensing side of DECC, and I would just like to say a very few words about the Office of Unconventional Gas and Oil. The Government announced that the office was established last December, and the office was up and running at the end of March, in order to help develop the shale gas industry in the UK and to ensure that it is environmentally safe, and also safe in the normal sense of the word. The office works very closely with the regulators, the relevant government departments and the industry to ensure the regulatory regime is as clear and simple as possible while safeguarding safety and protecting the environment. That is our role.

Q154 The Chairman: You partly answered the question I am about to ask in your last comments, but, as you know, in June 2012 the Royal Society and the Royal Academy of Engineering produced a report on shale, in which they emphasised the importance of co-ordination and said that co-ordination of the numerous bodies “should be maintained” and recommended that “a single body should take the lead”. That was in 2012. In October of

this year, giving evidence to us, Professor Robert Mair, who led the working group behind that report, was asked how these recommendations were going on, and replied: “The Royal Society and the Royal Academy of Engineering have had subsequent follow-up discussions with DECC, and I think ... it is acting on our recommendations”. Can you bring us up to date?

Duarte Figueira: As I said, we set up the office at the end of March. We have had contact with the Royal Society subsequently. We set up the office to provide exactly the sort of co-ordinated approach that was recommended in the Royal Society report, so there was clarity on the roles and responsibilities of different regulators and we had mechanisms to support that. We have set up a shale gas strategy group, which involves the bodies represented at this table but also other government departments and other stakeholders, like the Planning Officers Society and so on, which meets regularly and talks about the regulatory environment for exploration and then, subsequently, for production, and has been working on various bits of work. For example, DCLG produced planning guidance in July, part of which sets out very clearly how local planning officers should view their own work and the work of the regulators, to ensure that it is as streamlined as possible. That is one of the things that has emerged from the work that we have done as a co-ordinated body.

Lord Smith of Finsbury: Within the Environment Agency we have focused all our shale gas work in relation to all the different aspects in one place. It comes under Tony Grayling’s team. That team, which works to Tony, works very closely with both DECC and the HSE.

Peter Baker: There is also a memorandum of understanding between ourselves and the Environment Agency, which sets out a broad framework for how we both work together and plan our interventions, both in terms of longer-term strategy with the operators and in terms of how we conduct operations at individual site level. This reflects arrangements we

have between EA and HSE across a whole range of other major-hazard industries, which have worked particularly well over a number of years.

Q155 Lord Smith of Clifton: Gentlemen, would you please explain to us in more detail how the planning process and the issuing of permits works for shale gas development? In particular—because you have gone into some detail on this—is it desirable to make the current process quicker? Some of the witnesses who have come before us have said that, while you have got to maintain these safeguards, the edifice you have constructed makes speedy decision-making difficult.

Duarte Figueira: I have mentioned that mineral planning authorities are responsible for planning permission and, effectively, ensuring that the use of the land is acceptable. Very briefly, the planning process involves a number of stages. There are usually pre-application discussions between the operator and the mineral planning authority, and, indeed, the industry has now committed publicly to doing pre-application engagement in advance of putting planning applications in. The planning authority normally screens to identify whether there is a need for an environmental impact assessment, and there is subsequently a submission of the planning application by the operator, with or without an environmental statement, depending on whether an environmental impact assessment is required.

Lord Smith of Clifton: When you talk about pre-application procedures, is that aimed at speeding the thing up? What does it actually involve?

Duarte Figueira: It is encouraged by the planning system, but the industry has adopted it to make sure that the local community fully understands what is proposed before the planning application is submitted. At the point at which the planning application is submitted, the mineral planning authority will validate it and advertise it, and there will be a consultation on it so that the views of statutory consultees—such as the Environment Agency—and

communities can be taken into account. Then the decision will be made by the planning authority, which may or may not set some conditions.

On the point about speeding up, I mentioned the fact that the guidance produced by DCLG in July specifically advised that planning authorities should assume that the regimes that exist already—the regulatory regimes run by HSE and the Environment Agency—will operate effectively, and while these issues may be put before the mineral planning authorities by consultees, they should not need to carry out their own assessment but could rely on the assessment of the regulatory bodies. So, planning authorities would need to be satisfied that these issues were being dealt with by the regulators, but they would not need to revisit them. That was a way of streamlining the process.

Lord Smith of Clifton: Do you think, as more applications are made and we get going on this, the various agencies will themselves be able to streamline with experience the processes that have to be undergone?

Lord Smith of Finsbury: The broad answer to that is yes. We already encourage applicants to parallel-track their application for planning permission with their application for environmental permits. We aim to issue the environmental permit within a 13-week period. That, however, has to include a period for public consultation. If it is a matter of high public interest, the consultation period might have to be a slightly extended one, which might push the timetable a bit beyond the 13-week period, but we try wherever possible to meet the 13-week deadline. In terms of gradually getting quicker at this, the answer is that we would certainly hope to do that, and in the new year we will be consulting on the potential for having standard rules permits, where, unless there is something that is very out of the ordinary, it can fit within a standard pattern, and that would enable things to happen much more quickly.

Lord Smith of Clifton: When there is a considerable increase in the volume of applications, are you ready to proceed without undue delay?

Lord Smith of Finsbury: We would certainly hope so, but we do have to get it right. That means that we would need to prepare the standard rules permit proposal well; we would need to consult very extensively on it; and then we would need to come to a determination on it.

Q156 Lord Lipsey: What you have said confirms what many of our witnesses have said—that we have got as strong a regulatory process as any in the world. But some of us worry about a situation where we have 4,000 wells. This is only an environmentally satisfactory fuel in a transitional phase—at least according to the conventional wisdom—to help us to get rid of coal quicker, until we move to whatever is going to be the long-term energy source. Are you really sure that this is not going to stop development occurring at the kind of pace it is necessary for it to occur to be a national asset?

Duarte Figueira: The industry says—or claims—that they expect 20 to 40 exploration wells to be put forward in the next two to three years, and that will give us an idea of how much of the resource that has been identified through the studies DECC has carried out—on the Bowland shale, for example—may be turned into technically and economically recoverable reserves. We are happy—all the bodies here would say—that for the exploratory phase of the process we have the right regulatory system in place and we have the resources to enable that exploratory phase to proceed. Our answer would be that we certainly have the capability and the regulatory structure in place to enable the exploratory phase to proceed in line with industry expectations.

Lord Lipsey: Going beyond that, what is the first date on which you can imagine commercial exploitation of shale gas coming on stream?

Duarte Figueira: The industry talks in terms of the exploratory phase taking two to three years, and then there will normally be an appraisal phase, when the flow rate from the exploratory wells is analysed, and then production starts some time after that. They would certainly expect production to start before the end of the decade, but to be at scale in the early 2020s.

Q157 Lord Lawson of Blaby: May I follow up on what Lord Lipsey was saying? It does seem to many of us that a distinction needs to be drawn between the exploratory drilling and the production drilling, and that it is very important to be getting ahead with the exploratory drilling as soon as possible so that we know whether the vast amount of shale that there is in the United Kingdom—which has been established, indeed, in the north of England alone, and no doubt elsewhere—will produce commercially exploitable reserves on a very large scale, only on a very small scale, or somewhere in between. With exploratory drilling, a lot of the things that have been mentioned really do not apply. The quantity of water, for example, used in exploratory drilling is miniscule. It is puzzling for us, and I think it is puzzling for some in the industry, that it is taking so long. In the United States, where the Environmental Protection Agency is alive and well—an effective organisation—it all happens much faster. Why are you so slow?

Lord Smith of Finsbury: That question is directed primarily at us. First of all, it is worth gently pointing out that the United States did start rather a large number of years before us on this, but I would argue that we are not—in inverted commas—“so slow”. The ability to determine permits within 13 weeks seems to me to be quite expeditious given the circumstances. We would certainly hope to do better than that as more applications start to come through and as we get the standard permit rules very firmly in place.

Q158 Lord Hollick: I wonder if we can just look a little bit more closely at the length of the process. Various stages have been mentioned. Some may be concurrent; some may be sequential—I do not know. Pre-application discussions: is that a process that takes place?

Duarte Figueira: That is a process that the company would undertake, and be encouraged to undertake, and it is really up to them how long that would take.

Lord Hollick: That is a matter of a few weeks, is it?

Duarte Figueira: It would be purely a matter for the company to determine whether it wanted to engage in local discussions, hire parish halls and have meetings with local communities and so on. That is purely a matter for them.

Lord Hollick: Then the Environment Agency takes 13 weeks. Maybe more, maybe less, but that is what they are currently.

Lord Smith of Finsbury: Simultaneously with a planning application that has gone in. All of these things happen in parallel.

Lord Hollick: Right. Is the HSE also happening simultaneously with that?

Peter Baker: Yes. The HSE role, before the operations start, is not a permissioning or permitting role. All the operator does is notify us within 21 days, or longer, of the operation starting and we carry out our assessment within that 21 days.

Lord Hollick: Is it the case that the environmental permit does not really commence until the owner has signalled his or her agreement to this?

Duarte Figueira: Normally, getting permission from the landowner would be the first stage. That would take as long as the commercial negotiation took for the company.

Lord Hollick: Then that is the slowest ship in the fleet, maybe: the planning process itself.

Duarte Figueira: The planning process will depend to some extent on whether or not an environmental impact assessment is required, and that will require a period of work by the company to pull it together. Once the submission is made by the company of the planning

application, together with the environmental statement that reflects the environmental impact assessment, the mineral planning authority would normally validate it, place an advert and consult for usually around 21 days, and then the planning permission would normally take 16 weeks if it involved an environmental impact assessment, and, if it did not, around 13 weeks. These are indicative dates that are part of the planning system. As Lord Smith said, the environmental aspects can go along in parallel to that.

Lord Hollick: Is it the case that if you were drilling half a dozen exploratory wells within pretty much the same area—maybe a mile or so apart—this could be done as a group application, or does each one have to be done singly?

Duarte Figueira: This is a planning question and I will double-check it, but my understanding is that normally a planning application would refer to a specific development, or a pad. Normally, another pad with a well on it—if you are talking about exploration—would be a different development elsewhere, and it would not normally be very close; it might be a couple of miles, or further, away.

The Chairman: So far, very little drilling has taken place. Why?

Duarte Figueira: Essentially because the companies have been looking at the licences that were issued by DECC in the last licensing round in 2008 and preparing themselves through doing various activities, including seismic work and speaking to local communities. As in the case of Cuadrilla in Lancashire, they have carried out some activity. There was a period after the seismic event when there was a moratorium on hydraulic fracturing, which was lifted in December 2012, but since then the companies have started to take forward their work and we have seen commercial activity, including investments by other companies in those licence-holders.

Q159 Lord Griffiths of Fforestfach: Can I ask how many licences, or permits, have so far been given?

Duarte Figueira: DECC issued approximately 176 licences for activities under the last licensing round in 2008, and we intend to have another licensing round next year.

Lord Griffiths of Fforestfach: Do you know the average length of time it took for those to be issued? You mentioned 13 weeks.

Duarte Figueira: The licensing process is a separate process. Under European law, to carry out a licensing round, we have to do what is called a strategic environmental assessment of a plan or a programme, which is what we are doing at the moment for the next licensing round. Once that process is complete, once it has been consulted upon and once Ministers have decided what size the round is going to be, a commercial competitive approach is taken to this, and those licensing rounds are normally done in 90 days.

Lord Griffiths of Fforestfach: Given that the companies have been objecting and saying this could have been faster, do you have any idea of what their experience has been in relation to what you would like the norm to be?

Dr Grayling: If I might come in here on the issue of environmental permits, since the Government gave permission for hydraulic fracturing in principle to resume, we, the Environment Agency, have not yet received any permit applications to undertake hydraulic fracturing. The applications we have received have been for conventional activities—for example, the exploratory well at Balcombe, which was looking for oil; and, more recently, an application from IGas to drill and take core samples from a well at Barton Moss, Irlam, near Manchester—but not involving hydraulic fracturing. In both of those cases, we issued our permits well within the 13-week deadline. I think we did it in six weeks in the case of the well at Balcombe and nine weeks in the case of the well at Irlam.

Lord Lawson of Blaby: Are you in discussions about permits for hydraulic fracturing with any operator?

Dr Grayling: Yes. We are in discussions with a number of operators who are considering bringing forward proposals next year for hydraulic fracturing, notably Cuadrilla. We are expecting that they will come forward in the new year with a number of permit applications, alongside seeking planning permission.

Q160 Baroness Blackstone: Could I ask what the reasons were for your rejection of those two applications that you have just mentioned?

Dr Grayling: Rejections?

Baroness Blackstone: You said there were two that you rejected.

Dr Grayling: No, we granted the mining-waste permits within, respectively, six and nine weeks. In the case of Balcombe, we also issued a radioactive-substances permit.

Baroness Blackstone: Sorry, I misunderstood. So you have not rejected a single application for a licence for exploratory drilling so far?

Dr Grayling: No, there are some circumstances in which we would.

Baroness Blackstone: Or have?

Dr Grayling: We have not so far, because nobody has yet come forward with a proposal that we consider objectionable.

Baroness Blackstone: What are the reasons that you would adduce for a rejection?

Dr Grayling: Particularly if there were proposals to drill in a location that was particularly important for supplies of drinking water—what we would call source protection, zone 1. We would object to developments in those areas.

Baroness Blackstone: Because of the risk of water contamination?

Dr Grayling: Because of the heightened risk of water contamination.

Q161 Lord May of Oxford: By whom and how will the shale gas operations be monitored for environmental and public-health impacts in both the exploration and the

production phases—which, as Lord Lawson emphasised, are rather distinct? Who is going to carry it out and what engagement and oversight will the regulators have?

Dr Grayling: The Environment Agency will require monitoring, including baseline monitoring before operations start, as part of the conditions of our environmental permits, notably the mining-waste permit that is a requirement for all drilling activities, and we will ourselves examine the results of that monitoring to ensure that the operator is complying with their permit conditions. In addition, we may also carry out our own monitoring, which we do on a risk basis or if we think that an activity is being undertaken that is novel and contentious. For example, in relation to the well at Preese Hall, which is the only one where there has been some hydraulic fracturing so far, we took our own samples of the waste fracking fluids and analysed the contents of that waste, and we published the results of our analysis on our website.

Lord May of Oxford: You will be aware that the Royal Society report highlighted five main areas of risk, and I would add a sixth. The notes I have in front of me for the question go on for a page and a half and I will try to go through them quickly, but I would like to have some specificity on each of these six topics: groundwater contamination; treatment of waste water; methane emissions; well integrity; fracture propagation-induced seismicity; and air quality. First of all, groundwater contamination. I should declare a non-interest, in that I had nothing to do with the Royal Society report. The Royal Society recommended that the UK environmental regulators work with the British Geological Survey to carry out national baseline surveys of methane and other contaminants in groundwater. What is the standing of that?

Dr Grayling: We are indeed carrying out joint work with the British Geological Survey, in particular on assessing groundwater levels of methane as a baseline. In addition, in relation to

its specific developments, we will require the operator to do that. For example, we required Cuadrilla to carry out baseline monitoring from a sampling borehole on their Balcombe site.

Lord Smith of Finsbury: It is probably fair to say that groundwater contamination is the biggest environmental risk in this activity, so we do have to be pretty careful about it. At Preese Hall, which is the one site where fracking has taken place thus far, there were no groundwater aquifers anywhere near the drilling location, as far as I recall.

Dr Grayling: The only groundwater nearby was saline and would not be suitable for potable use.

Q162 Lord May of Oxford: On the question of well integrity, the 1996 regulations apparently require that the design and construction of onshore wells be examined by an “independent and competent person (well examiner)”. The well examiner—if I believe this—is currently commissioned and paid for by the operator, and it is true that the 1996 regulations state that the examiner “might be someone employed by the well operator’s organisation”, but Robert Mair, the person who chaired the Royal Society thing, regarded that as a very undesirable thing to do and recommended that these guidelines be clarified so that one is really ensuring the independence of the person. I would welcome responses to that.

Peter Baker: The guidance that goes with the independent-examiner requirements under the regulations sets out very clearly how to ensure independence. It is right that operators have the option of using someone that they directly employ.

Lord May of Oxford: Do you not find that inherently contradictory? I do.

Peter Baker: In the majority of cases they do not; they use external operators.

Lord May of Oxford: What are they doing in this case?

Peter Baker: In the majority of cases they use independent contractors. This is not unusual in major-hazard industries. The offshore industry uses third-party verification as well, for a

number of significant integrity issues to do with offshore installations. Our assessment and the evidence indicate—and the Select Committee inquiry into deepwater drilling following Deepwater Horizon also indicated—that it does not necessarily follow that having your own people do third-party verification is a bad thing.

Lord May of Oxford: Do you not draw a distinction between the wells being in the midst of a community and something being in the ocean?

Peter Baker: There is a difference, clearly.

Lord May of Oxford: There is a difference, and it makes it more sensitive. Even if there are not conflicts of interest, you should be avoiding the appearance of them.

Peter Baker: But similarly, on an offshore installation, a lack of well integrity can have very serious consequences as well, as we all know. This is in addition, though, to the independent regulation by us as HSE; it is not the sole assurance that the operator will get. They will get the independent inspection by HSE well specialists, and, as part of our inspection system, we do concentrate on how the operators ensure both the efficiency and integrity of their well-examination scheme, and, where they use their own employees—which is quite rare—they maintain that necessary level of independence. It is an important barrier in the well-integrity control system.

Q163 Lord May of Oxford: Ticking the next box, the Royal Society report recommended an appropriate body carry out national surveys to characterise stresses and identify faults in UK shales: site-specific surveys. I take it that is before, during and after fracking. I take it that is in hand.

Duarte Figueira: DECC has already published various bits of work outlining the tectonic history of many areas that are prospective for shale, but we commissioned them to complete a Bowland shale regional mapping project, which was published in June this year. We have a further study to map the Jurassic shale gas potential in various areas of

prospectivity. In terms of our specific requirements within DECC, as I mentioned at the outset, one of the things that we require if fracking is contemplated in a particular project is a fracturing plan from the company to address the risk of induced seismicity, related to the licence. We will review that plan before any operations are permitted.

That involves a series of stages. First of all, the operators have to review the available information on faults in the area. Secondly, there has to be background seismicity monitoring carried out for a period to provide a baseline. Then the actual hydraulic-fracture programme has to be completed and submitted by the company to DECC, which is essentially a risk assessment. That should be designed to use only the amount of fluid required to fracture the rock sufficiently to allow the gas to flow, and the pressure should be quickly reduced thereafter. We have introduced a traffic-light system for when fracking actually occurs. You may have heard of it. That essentially involves operations being halted in the case of a seismic event of more than 0.5 being registered. The reason we do that is because, when we had the seismic events at Preese Hall, which were 1.5 and 2.3 on the Richter scale, they were preceded by some seismic events that could have potentially led to anticipation of the later ones. Once the fracking and the flowback are completed, the monitoring continues for at least 24 hours after, to identify any abnormal events post-frack. In addition, we have a requirement for equipment—tiltmeters and seismometers—to be installed to determine the penetration of the frack into the rock, just to make sure that is consistent with what the company said it would be. There is quite a detailed process that is required when fracking resumes.

Q164 Lord May of Oxford: I will take the next two boxes together, because they should be more straightforward: monitoring potential leakages of methane or other emissions before, during and after operations and submitting them to the regulator; and also minimising the use of waste water and recycling and reusing it. I take it that is all in hand.

Dr Grayling: Again, we require monitoring of methane as a condition of our mining-waste permit before and during operations, and we expect complete containment.

Lord May of Oxford: Good. The last thing comes back to the question of how confident one can be that well examiners and other people involved are truly independent of the operators who have appointed them. We have one anecdote here. You will understand that it comes indirectly, via some of the people who live around there. Cuadrilla has appointed Ground Gas Solutions (GGS) independently to monitor the air quality for the duration of its activity at Balcombe. One of the residents rang GGS just to find out how independent they were, and she was told that it was none of their business, and that, "All requests for information are to be directed to Cuadrilla's enquiries contact address". I see this as at best a failure of tact, and I hope it is no worse than that. Could someone reassure me?

Dr Grayling: That is possibly one for the companies involved to answer rather than ourselves, but we would take air quality seriously. For that reason, for example, we would require very stringent standards to be applied to the flaring of any waste gas on the site, although at Balcombe they have not yet got to that stage.

Duarte Figueira: There are a couple of other bodies involved in air quality. Mineral planning authorities have a role in ensuring that the air quality impacts are acceptable. That can include, for example, issues like dust rising from the construction. That is particularly important in an area where there might be poor air quality. They can set planning conditions and they can also have Section 106 agreements as a result of their planning permission. In addition, within DECC we have a very strong policy on minimising the release of gases as a condition of the licence. For example, we would allow venting as part of the licence conditions only in the case of a safety requirement. In the case of flaring, we would seek to minimise it to the technical and economic minimum. That would be at exploration, and at

production we would certainly expect there to be much more of a green-completions approach going forward.

Lord May of Oxford: I did have a last question, but I am not going to ask it, because we have had a statement about it.

Q165 The Chairman: I think it is worth asking. It is the question about the concern that has been expressed by Professor Richard Davies from Durham University over how well wells will be monitored once they have stopped producing. Are there regulations in place to deal with abandoned wells?

Duarte Figueira: The position from the licensing point of view is that the operator remains liable for the well, essentially. The liability stops with the operator and, if there were a difficulty with the well, we would expect to ask the operator to remedy it going forward.

The Chairman: There is no independent monitoring.

Duarte Figueira: I am not aware of independent monitoring

Lord Smith of Finsbury: We would expect, as part of the monitoring of the operation of the well while it was happening, that the plans to ensure that anything was properly contained subsequently were very firmly in place, and we would be making sure that that happened. In relation to what happened subsequently, we would, I imagine, in the same way as we do for abandoned coal mines, from time to time need to monitor and regulate if a problem were to arise—but we would want to make sure that problems did not arise in the first place.

Q166 Lord Hollick: I will just start with a follow-up to a comment that you made, Dr Grayling, about saline water. One of our witnesses, Professor Muller from Berkeley University, told us that the hydraulic fracking technology had improved dramatically, to the point where substantially all of the water that would be used would be saline water. Are you familiar with these developments?

Dr Grayling: I would not claim to be a particular expert in that area, but we would encourage operators to look at ways of managing their use of water to reduce the impact on the environment, and one of the options would be the use of non-potable water—water that would not be suitable for drinking purposes. We would also encourage the recycling of fracking fluids to reduce the amount of further water you need to take from the environment. It is very important to understand that if you want to take large amounts of water from the environment, you require a licence from the Environment Agency or our sister bodies in other parts of the United Kingdom, and we would not license levels of abstraction beyond that which would be environmentally safe. We undertake a catchment assessment to make an assessment of what level of water abstraction is sustainable.

Lord Hollick: It would be well worthwhile following that up with Professor Muller.

Duarte Figueira: Perhaps I could just add to that. I did recently visit the Eagle Ford Shale in Texas and I had a number of discussions with individuals around the possibilities of using non-potable water. The general picture that we got back was that yes, it is certainly possible to start moving in that direction, but it will take some time and the technology is not completely there yet. There are certainly possibilities in that direction at the moment.

Q167 Lord Hollick: We heard from Balcombe residents about cancer concerns. They referred us to a report from the Colorado School of Public Health, which the Royal Society also referenced, which suggested that there are higher cancer risks for residents living within half a mile of a well than for those living further away. Would you like to comment on that?

Dr Grayling: We certainly take the risks of emissions of pollutants, including carcinogenic pollutants, extremely seriously. I am not personally familiar with the Colorado study, but it is important to note that there are practices permitted in the United States—or at least certain states—that we would not permit in England or, indeed, in other parts of the UK. For example, we would not permit the use of venting of gas, as Duarte has already outlined,

which can result in toxic pollutants getting into the atmosphere. We would not allow waste fracking fluids to be stored in open pits or lagoons, which are sometimes used in the United States and which can mean that you also get pollutants getting into the atmosphere. We take our responsibilities on this front very seriously. For example, we would also not allow the use of substances in fracking fluid that we consider to be hazardous to groundwater in the first place. In many ways, we have a tighter regulatory regime than is the case in some states in America.

In addition, the industry is at a much earlier stage of development in the UK, and I suspect that part of the air-quality issue that has been identified in Colorado will be because they are at the production stage, where you have got a higher density of operations, including probably the use of diesel engines and other sources of pollutants on sites. We will certainly need to be mindful of the cumulative risk that you might get when operations scale up, and we will adapt our regulatory approach accordingly to ensure that you do not get unacceptable levels of pollutants going into the atmosphere.

Duarte Figueira: Can I just say a couple of quick things? One is that I had the pleasure of speaking to Balcombe parish councillors and reading the report—it was one of the first things I read when I started the job—and they did an enormous amount of work to identify the potential risks, which is incredibly helpful for the local people. Just briefly, though, the work that I think is being referred to in that quote was analysed as part of a document that was published in October by Public Health England, which was an analysis of all the various chemical and radiological risks that may occur as a result of shale, and that study is possibly something that your specialist adviser is aware of. That referred to a study in Colorado by McKenzie et al, and it did suggest a higher risk of adverse health effects, but it pointed out that the results were preliminary and needed more research and that, indeed, the methodology was not recommended by UK authorities. Public Health England's overall

summary was that, on current evidence, the impact of individual shale-gas wells on local air quality was likely to be low in the UK if operations were properly run and regulated, that any failures were largely down to management failures, and that the regulatory environment in the UK would not allow such risks.

Lord Hollick: Do you think further research is required? Clearly, the CEO of Cuadrilla does not feel that, because he said when we were discussing this with him that there is “zero correlation between any incidence of cancer and the drilling of our well”. He was referring to Balcombe.

Duarte Figueira: What I am saying is that the PHE report suggested that the risks arising were low if things were properly managed and regulated. Whether additional research is required is really a matter for PHE to consider as part of their ongoing work.

Lord Smith of Finsbury: The key principle for us here is to contain very securely any environmental arisings that might have a hazardous or toxic nature, and that would be particularly in relation to any fluids or gases. We would make sure in issuing any permit that there was proper containment in place.

The Chairman: If there is anything you would like to send us on that particular incident in a further note, please do so.

Q168 Lord Lipsey: I am sorry to raise Balcombe again, but the local Balcombe pressure groups have been very assiduous in keeping this Committee informed as to their concerns, and we are grateful for that even if we do not share them all. One of the main ones they raise is about noise. Here, the difference between the company and the residents is enormous. The residents speak of months of sleepless nights; the head of Cuadrilla, on the other hand, described a breaching of the limits laid down by the authorities for noise as “less than a whisper”. I do not think there is any doubt that he was being economical with the truth; I cannot say whether the residents were economical with the truth when they

described the sleepless nights. It would be very helpful to hear from you what the regulations are and how you make sure that they are adhered to and not just broken when it suits the company.

Lord Smith of Finsbury: Noise requirements are put in place as part both of the planning approval from the local authority and of the environmental permit that we issue. At Balcombe, during the drilling process, both we and West Sussex County Council received a number of complaints about noise. When we investigated and assessed it, Cuadrilla turned off their equipment and fitted noise-abatement measures to it, because that was required in order to meet the conditions that they were supposed to meet. After the equipment and the barriers had been put up, no further complaints were received by us.

Q169 Lord Skidelsky: In our notes, Mr Figueira, you are quoted as saying that the UK Government “is engaging with communities to explain the benefits of shale gas development”, and that “industry also needs to do that”. Presumably you would want the Government to explain the risks as well as the benefits.

Duarte Figueira: I do not know where that is quoted from. The position that we have is quite clearly that we believe that early engagement by companies with local communities is critical, and we have been encouraging the industry very strongly to make that happen so that they can explain their projects and the implications of them. Our role within OUGO, which is set out in our published objectives, is to support public engagement—including ensuring there is access to evidence-based information—so we can address the questions that they raise. For example, on the gov.uk website we have an extensive list of—I think 70—questions and answers on various aspects of shale, the majority of which are based on scientific information that tries to explain what the different aspects are, whether it is seismic or water or air quality, and so on. We are planning to increase over time the accessibility of that information and its use, so that it is public-facing and scientifically

objective. We are shortly planning to publish a regulatory road map, which will set out, not just for planners and for companies but also for people in localities, what the various aspects of the regulatory process are, not just in England but in Scotland, Wales and Northern Ireland. It will make it very clear what the regulatory requirements are.

Certainly, part of our role is explaining the Government's policy on energy, including shale's role within that and within the gas strategy, but a lot of our work is essentially trying to make sure there is explanation at both the national and the local level of what the regulatory system is and how it applies. For example, in Lancashire, we, the Environment Agency, HSE and the local mineral planning authority presented to local county councillors and district councillors the full range of the regulatory process and allowed questions and answers on that. I did a similar event with the Environment Agency and a well-known scientist in the area at the South Downs National Park Authority, which was attended by members of the public. Members of my team have been in Lancashire and other parts of the country, explaining to local communities what the science is, and essentially making sure that people understand what the regulatory process is. We are not being proponents for shale in that sense; we are explaining how shale fits into energy policy.

Lord Skidelsky: I am trying to visualise this. There is a meeting in the town hall and the operators say, "Look, this will bring wonderful benefits to the community because of *a, b, c, d*" and so on. Then Lord Smith turns up from the Environment Agency and says, "Wait a minute. There are these things you have to consider, too." Is that how it is going to go? Shoving reams of paper onto websites is not going to engage the local community at all in the debate, really. It might engage a few councillors. I thought there was something a bit more interactive being suggested here.

Q170 Lord Shipley: Can I add to that question and just ask who you think is responsible for leading consultation? We have applicants, we have local councils, we have government

departments in Whitehall, and we have government agencies represented here. I am not clear from the evidence you have given so far as to who leads a local consultation. Are you clear about that?

Duarte Figueira: Yes. When companies explain their projects to local people, they may ask us and the Environment Agency to be present and may ask us to explain what the Government's policy is on energy, and the Environment Agency to explain what the regulation is. Those are events the companies may put on, which are explaining their projects to local people. However, if we are engaging with local communities, normally we would expect the parish council, the county council or the district council to ask us to put on an event—as we did in Lancashire and we did in the Weald—where the range of the science and the regulation is explained objectively to people. What we are trying to do is to enable people to be well informed about the regulation and the facts about shale and the facts of the geology. We would take the lead in helping organise that with the parish council, or local council. We would have colleagues from HSE and EA present with us to give us the full range, because within OUGO we are not experts on well regulation, for example, if a question came up in that area. We would regard ourselves as being in the lead with, say, the district council in an area that is likely to have an application.

Lord Smith of Finsbury: On the whole, I would expect the local authority to take the lead in arranging and fostering any local consultation process.

Lord Shipley: To be clear, it is the planning authority, as opposed to a parish council, which is a consultee.

Lord Smith of Finsbury: It will depend on the circumstances, but I would envisage that it probably would be the planning authority, because they would need to be consulted in any case in relation to the planning permission. We would have the formal consultation process where we put out the documents relating to the permitting, but in terms of public meetings,

discussions and helping people with information, the organisation of that I would anticipate being done by the local authority. We would very willingly come along. It would not be our place to argue for or against shale gas; it is our place to inform people about what the environmental regulations are and how they could be met.

Q171 Lord Skidelsky: Thank you. I would like to ask one more follow-up, please. It is a question on inducements. The UK Onshore Operators Group has proposed that local communities receive from extractors—that is, operators—£100,000 per well site at the exploratory stage and then a 1% share of proceeds at the production stage. Is that based on a well worked-out premium for the risk that the communities would be running, or is it simply a bribe?

Duarte Figueira: You must remember this is an offer from the industry. The industry has brought forward its community-benefits offer and it has all been wrapped up in their community engagement charter. The Government has welcomed that, and we have done that at a very early stage. At the moment, we have got to remember that we are still in a position where we do not know how much of the resource that exists can be translated into technically and economically recoverable reserves. At a very early stage, the industry has come forward, largely on the basis of not really knowing how much is going to be produced, and made an initial offer. They have said in their community engagement charter that they will keep the matter under review.

Lord Skidelsky: So is it a negotiating position, as it is with a landlord?

Duarte Figueira: It is what they have offered the local communities at present.

Lord Skidelsky: It is not based on any serious cost-benefit analysis of rights being traded?

Duarte Figueira: It is very difficult for the industry to know exactly how to make that calculation in the absence of the explorations going forward.

Q172 The Chairman: Can I ask you one question on the issue of information? In your note to us, Mr Figueira, you say that your office “is now developing plans for engaging the public in a well informed debate on shale”. You have tended to concentrate on the regulatory process, procedures and so on in your answers so far, but are you intending—as the industry I think would like to see—to put more of the case for the benefits and contributions of shale to the wider population, if the exploratory wells prove that it is right?

Duarte Figueira: What we have done is a mixture of national and local. It is absolutely true to say that in the first six months of our existence, our focus has been very much on making sure that the regulatory position is clear. That included the DCLG’s work on its guidance, the Environment Agency’s own consultation on guidance and our own regulatory road map that we plan to publish shortly. Our focus now has shifted and we have started to do a lot more both local and national engagement.

When we say we want to inform the public, it has two dimensions. One is that there is very clearly a need to make sure that people understand fully the specific dimensions they may have concerns about. We have tried to make sure that issues are well understood through national publications and reports, such as, in terms of health, the Public Health England report; and, in terms of emissions, Professor MacKay’s study. In the case of Professor MacKay’s report, we made sure that we had a launch at the Science Media Centre, which was attended by journalists so that they could report it properly, and that the presentations on the science were given by scientists. We had a similar event in the House, sponsored by the APPG, for MPs and Lords.

At local level, we respond to requests from local bodies, whether they be county councils or lower levels of administration, to give presentations that outline the regulatory process and address any concerns they may have through questions and answers. They explain how shale fits into the Government’s energy policy—I would normally do that sort of presentation—

and they also outline the potential benefits of it if the resource can be translated into reserves. Those would be improved security of supply, tax revenues, and the like. That is part of our mission, and that is very much part of our work going forward.

Lord Smith of Finsbury: We have said at national level on quite a number of occasions that it is our view that shale potentially has a useful part to play in the energy mix for the UK, provided that it is done and extracted safely, and it is our job to make sure that that happens.

Q173 Baroness Blackstone: Turning from the local to the transnational, we gather that the European Commission is considering publishing proposals for an EU-wide framework for unconventional fossil-fuel extraction that they want to harmonise across all member states. Do you know what these proposals are likely to be, and do you agree with them?

Duarte Figueira: The Commission is currently reviewing the European legislative framework for unconventional hydrocarbon extraction, including shale gas. We expect them to publish proposals in the new year, so we will not know until then what they propose. We are talking to them, because that is the way you influence things in Brussels—by making sure you get in early—and we will have to negotiate more formally when the proposals are published. In terms of what we think the need for EU action is, we can see the value in developing guidance across the Union that would provide clarity and ensure that the directives are applied uniformly across member states, but we do not believe there is any need to legislate further. We must ensure that EU action is proportionate and does not result in new regulation in the industry that is not required. In addition, the uncertainty that would be involved in the timeframes for legislation would also be an issue for concern, given the fact that we think the existing directives cover the risks that need to be addressed, and we want to get the exploration phase away as soon as possible, in the way that has been described. We should also say that, in terms of discussions with the Commission, we have

been sharing best practice with them—that is something perhaps the EA might say something about—and we have in the UK over 50 years' experience of onshore regulation in oil and gas to draw on in doing that.

Baroness Blackstone: Are you saying that you do not envisage a great deal of change being necessary to the UK's regime once these are brought into force, or not? I do not quite follow.

Duarte Figueira: We do not believe there is a need for legislation. We believe that there might be a benefit in having some guidance across the European Union on how the directives should be applied.

Lord Smith of Finsbury: Our view, likewise, is that the current suite of directives that apply to these operations is entirely sufficient to secure environmental protection.

Q174 Baroness Noakes: I want to turn to the potential for shale gas in the UK. We have recently had the British Geographical Survey assessment of the Bowland-Hodder shale, and they told us that they were going to produce a report on the Weald early next year. Do you believe that these studies are proceeding at a fast enough pace, or does there need to be some more energy put into the programme? There are other areas in the UK that remain unlooked-at by BGS.

Duarte Figueira: You had evidence from my colleague, Toni Harvey, early on, on the work that is being done in this area. I should say we have also started work on a study of the Midland Valley of Scotland—I am not quite sure whether that was mentioned by Toni—and that will cover various bits of work related to that. In general terms, the studies bring together a whole set of separate analyses, so many of these cannot be done in parallel, I am told by the geologists. The Weald study is proceeding faster because the study area is quite small and structurally less complex. The studies do take time to get right and, at BGS and across the UK industry—because the UK industry has been helpful in this respect, as Toni

outlined—the expertise is in fairly short supply. It is not as if any geoscientist can do the work, so throwing more people at the problem will not necessarily speed it up. We are trying to do this work as quickly as possible.

Baroness Noakes: Were DECC late to the party?

Duarte Figueira: No, I do not think so. The work is being carried out in line with the programme that was agreed some time ago. It just takes time to do the studies.

Baroness Noakes: So the constraint is the lack of people with expertise. Could they not be brought in from America?

Duarte Figueira: The constraint is simply the complexity of the work. The BGS already has the basic raw materials, but it takes a long time to process it. It also involves the use of external reviewers, who need time to peer-review, and these experts do this on top of their day jobs. It just takes time to include their contributions in the process. No, I do not think that the work has been done slowly; it is all proceeding at a reasonable pace.

Baroness Noakes: You mentioned three areas that have been done, or will be done. What other areas in the UK are planned to be covered by these surveys? Are there any no-go areas in terms of potential shale exploration?

Duarte Figueira: There are some areas of the UK that are regarded as not being highly prospective for shale. Toni may have mentioned the Scottish Highlands as being one such area. There is prospectivity, for example, in parts of Wales, and there will be further work done by the department in due course. If the Committee would like, I could ask my colleagues on the licensing side to do a note on the plan for those studies.

Q175 Lord Griffiths of Fforestfach: Do you think the development of shale in the UK requires a special tax regime?

Duarte Figueira: That is a difficult one for me particularly to deal with, because tax is a matter for the Treasury. They are planning to respond shortly to the fiscal proposals that

they consulted on in any instance, and certainly within the timescale of your inquiry. In general terms, in the offshore sector these targeted field allowances—which were consulted on in respect of onshore—are very similar, and they have contributed to record levels of investment. That type of incentive has worked in that way.

Q176 Lord Rowe-Beddoe: Let us turn now to the economic implications for the country, both in terms of employment and of use of this. There are, confusingly, some quite disparate figures here. We have from the IoD's publication, *All Hail Shale*, information that the production phase of shale gas could support 74,000 jobs. The Prime Minister himself used this figure, I understand, in the *Daily Telegraph*. On the other hand, AMEC—I believe it is now stated in a private meeting with DECC—used a figure of 15,900 to 24,300. Those are very precise figures, I must say, but there we are. We understand that they base this on different assumptions about the speed at which wells are drilled. However, with such a wide range of potential economic impact with regard to jobs and job creation, what are your opinions on this?

Duarte Figueira: To be honest, the economic impact of shale, whether it is jobs or other elements of economic activity, will very much depend on the level of production and, indeed, production costs—which, again, we do not know yet.

Lord Rowe-Beddoe: And the speed.

Duarte Figueira: And the speed. The IoD figures were hailed at the time because, in many ways, that was the only report that was around when it was published in May. It is a scenario of 74,000 jobs. They talk about £3.7 billion of capex. We will need to see. We are doing some work. DECC consultants are finalising the environmental report to be published as part of the consultation for the strategic environmental assessment for the next licensing round, which I have mentioned, and this will present some high and low-level scenarios for future development of the industry and the potential employment implications of that. That

is another set of figures that will appear shortly, and I think it will appear within a timescale that means you can take it into account in your inquiry.

I should mention that as well as the community benefits that I have mentioned already, there are some other benefits that will arise from growth locally, including the Government's reform of the business rates retention scheme, which will allow a higher proportion of rates to be retained locally where there is local growth. So, if there are shale developments locally, there will be a benefit to that once production takes place. There will be other aspects to take into account as well.

Lord Rowe-Beddoe: AMEC are now being commissioned to carry out the strategic environment assessment.

Duarte Figueira: They are our consultants to carry out the environmental report, yes.

Q177 Lord Rowe-Beddoe: In his evidence to this Committee, Professor Dieter Helm said it is "hard to make a case" that the UK and Europe will have energy-intensive industries in the future. The reason we have brought this in is because we have heard evidence that if we had much more competitive energy prices, it would greatly impact on our ability to attract energy-intensive industries. Professor Helm says he believes that the US gas price will continue to be "amazingly competitive" when compared to European prices. Do you agree with this analysis?

Duarte Figueira: It is worth bearing in mind that we have not yet had the exploration phase and, as a result, we do not know how much shale will be produced economically; we do not know what its production costs will be and how they will compare. It is important to keep reminding yourself of that when you are making assessments of this type. We had a piece of work carried out via a company called Navigant, which was published in the middle of this year. I do not know if the Committee is aware of that piece of work, but we are very happy to make it available; it is public on our website. That has a number of scenarios, and it does

talk about a scenario where it is possible that there will be a decrease in energy prices. It relies on production in the US being exported; it talks about production of shale in China; and it talks about production of shale in Europe, not just in the UK. There are some scenarios that you could analyse that result in lower prices. Certainly from the point of view of the department, we would say that large-scale shale production would undoubtedly have a downward pressure on prices; we cannot rule out a price, but we take a cautious view of any estimates of what that price will be. That is our position: we take a fairly cautious view on what the price impact might be.

Lord Rowe-Beddoe: US gas prices are about 25% of what we are currently paying. Is that right?

Duarte Figueira: I understand they are in that range.

Lord Rowe-Beddoe: \$3 to \$4 per million BTUs.

Duarte Figueira: \$3 to \$4, yes.

Lord Rowe-Beddoe: And we are somewhere around \$10 to \$12.

Duarte Figueira: Yes. You have to take into account the transport costs.

Lord Rowe-Beddoe: You could transport an awful lot for \$9 across the Atlantic.

Q178 The Chairman: We have taken a lot of evidence on the economic impact, and we had a very graphic description of the effects on some parts of the United States last week, when Mr McAleer described the tremendous benefits at great length. In your well informed debate on shale, do you regard it as your responsibility—or the Government's responsibility—to emphasise some of the economic benefits as well as all the security arguments, all the safeguards and so on?

Duarte Figueira: The important thing is, when we are talking to the public, we make statements that can be objectively backed up and are scientifically proven. In terms of the sort of discussion we have just had on price, for example, we would set out our analysis on

it and we would make it very clear, if we were asked, what that was. We would certainly make the point that if shale was developed in the UK at scale, it would have positive impacts in terms of security of supply, which is important, and it would have tax-revenue benefits and other economic benefits, including job benefits.

The Chairman: For energy-intensive industries, for example, and so on.

Duarte Figueira: Yes, potentially so.

Lord Smith of Finsbury: One side-effect of what has been happening in the United States in terms of the gas price is that the United States has been selling coal very cheaply on the global market. Our use of coal here in the UK for power production has gone up to its highest level for many years as a direct result of that.

Q179 Lord Shipley: Could I ask a very specific question, first to Mr Figueira? You spoke at the *Financial Times* Global Shale Energy Summit in October, and you said, as it has been reported, that shale gas “is a transition fuel to 2030”. Is it a transition fuel, given that we do not quite know how much there is?

Duarte Figueira: Certainly from the point of view of energy policy, we have a gas-generation strategy that makes it very clear that gas will continue to play a very important role in the electricity mix in the coming decades. Certainly in terms of decarbonising the electricity system—we normally talk in terms of 2030—there will be a continued need for gas in the decarbonisation efforts. I also said—I do not know if it was reported—that it is potentially a destination fuel if we can get CCS working as we expect, in which case we can also have gas well beyond that. Of course, gas will be required for heat well beyond 2030. It is not purely a transitional fuel, but it is certainly part of the energy mix to 2030.

Lord Shipley: How quickly might we have carbon capture and storage?

Duarte Figueira: That is a matter that the Government has invested a good deal of effort in, in terms of our work, both in the R&D phase and in contracting, but I cannot give a specific date on that.

Q180 Lord Shipley: More generally, for everybody: does the advent of shale gas alter the Government's energy policy? Is it likely to have to be adjusted in the years ahead?

Duarte Figueira: In terms of unconventional gas from shale, it is purely a matter for us whether it is domestically produced or whether it is imported. Gas will continue to play a part in the energy mix even beyond 2030, for various reasons and for various purposes, so the reality is that what we are talking about here is purely whether or not we can produce it domestically at a cost that makes it economic. It does not have an impact on our gas-generation strategy, except that it improves our security of supply to some extent.

Lord Shipley: And it has no impact on our climate-change targets—or does it?

Duarte Figueira: The study that was carried out by Professor MacKay in this respect set out that the emissions impact of unconventional gas produced in the UK would certainly be lower than the impact from coal, and probably lower than the impact from conventionally produced gas from outside Europe—so its emissions impact was likely to be low compared to the normal case, if you like.

Lord May of Oxford: Can I just clarify that? My understanding of that—I am a member of the Committee on Climate Change—is that the trajectory to 2030 is one in which we are still putting fossil carbon back into the atmosphere, and we will put less if we do it with gas than if we do it with coal.

Duarte Figueira: Yes, of course.

Lord May of Oxford: That is a good thing, but that is not the only aspect.

Q181 Lord Lawson of Blaby: Baroness Blackstone referred to the European activity on the environmental front, which I must say I find rather puzzling, because the sort of things

we have been talking about today on the environmental front are supremely local issues. It does seem very puzzling that this is not a matter par excellence where the subsidiarity doctrine would apply. That aside, another thing puzzling me is that Lord Smith said—I think I took it down correctly—that he considered groundwater contamination to be the biggest environmental risk, yet we heard evidence that in the United States, over many years, with hundreds of thousands of wells drilled, there has been not a single authenticated case of groundwater contamination. I am puzzled, Lord Smith, why you consider that to be the biggest risk.

Lord Smith of Finsbury: I would simply say that, provided that drilling takes place in the right place and provided that it is properly regulated by the suite of European regulations that happens to exist, there should be no risk to groundwater. If a well were to be drilled in a location that was directly adjacent to a drinking-water source, for example, there could potentially be problems. That is why there needs to be proper environmental regulation in place to make sure that it is safely and properly done.

Lord Lawson of Blaby: I entirely accept that you need to keep your eye on it—that is absolutely right—but, as I say, the evidence from the United States is very clear. It is not surprising, because the aquifers that are used for drinking water tend to be at very shallow depths, whereas, characteristically, fracking and the drilling for shale is very deep down—something like a mile down, or sometimes more. Therefore, although I agree that you have to monitor it, that must greatly reduce the likelihood of any groundwater contamination, must it not?

Lord Smith of Finsbury: Yes, but some of the chemicals do come back up to the surface through the well.

Lord Lawson of Blaby: Nowadays it is 95% water and a tiny amount of chemicals, is it not?

Lord Smith of Finsbury: And they need to be properly contained when they get to the surface. Tony, do you want to add to that?

Dr Grayling: That is absolutely right. Where there have been problems, in a small minority of cases of wells in the United States, they have been to do with the poor sealing of the well nearer the surface, and that can apply to wells that are used for hydraulic fracturing as well as those that are using conventional extraction techniques. It is particularly critical from the point of view of environmental protection that the well is properly constructed and sealed in the first place. It is our responsibility to ensure, along with the Health and Safety Executive, that those regulations are properly applied.

Q182 The Chairman: To sum up, because you are dealing with all the environmental and other impacts and risks of the shale oil and gas development, is it your view that we have, and will have, a sufficiently robust regulatory regime to deal with all the risks that we have discussed and that are part of the public debate?

Lord Smith of Finsbury: Yes. That is partly because onshore drilling for minerals is not a new process. Some 2,000 wells have been drilled onshore in the UK over the past 100 years or so. There are currently 120 operating sites and around 300 operating wells. They produce in excess of 20,000 barrels of oil each year. Each of those is regulated for their environmental impact. They have to have environmental permits. Yes, there are some new aspects that come into the equation with fracking, but it is not an impossible process; it is something we are very familiar with.

Peter Baker: From a health and safety perspective as well, it is worth remembering that the current regime was introduced in the mid-1990s, on the back of Lord Cullen's recommendations following Piper Alpha, which introduced a series of important barriers in the control of wells both on and offshore. There is a very strong evidence base for the efficacy of the regulatory regime, which has been shown to be fairly robust.

Duarte Figueira: I have two quick things to add to that. People sometimes talk about the fact that we are adjusting the onshore regime from the offshore regime. In fact, originally, the regulatory regime was constructed for onshore; it was taken offshore in the 1960s and now the focus is back on onshore. There is that point to pick up. More generally, what we have been talking about for much of the discussion has been the regime that applies to exploration. We are not complacent about it; we have done quite a lot of work in the last six months to make sure that it is robust for exploration, and I think that all colleagues in the regulatory sphere agree that it is robust for exploration. Part of our role within OUGO is to start thinking now, two or three years ahead, to make sure that the regulatory regime is fine for production as well. There will be some impacts that will be different at production scale from those at exploration. That is a focus for the office's work, alongside the public engagement work that I talked about earlier.

Q183 Lord Hollick: In the light of what Lord Smith said about the adequacy of the current regulations and guidelines set down from Europe, do you fear that there is a danger that the European Union will simply gold-plate existing regulation and make it more cumbersome?

Duarte Figueira: Part of what I said before was essentially about ensuring that that does not happen. The position we have adopted on regulation is essentially that we can see that there is a case for making sure that different member states apply the suite of directives that already exists, which Lord Smith referred to, in a consistent manner, and we can see that there might be concerns about making sure that does happen—but we do not see the need to go beyond that and to gold-plate in the way that you have described.

The Chairman: Gentlemen, there were a couple of points on which you said you would send us a note, and we will look forward to those. Meanwhile, thank you very much indeed for coming this afternoon.

Duarte Figueira: Thank you for the opportunity.

The Chairman: Thank you.