Select Committee on the European Union

Energy and Environment Sub-Committee

Corrected oral evidence: Brexit: energy security

Wednesday 13 September 2017

10.30 am

Watch the meeting

Members present: Lord Teverson (The Chairman); Lord Curry of Kirkharle; Viscount Hanworth; Lord Krebs; Lord Rooker; Lord Selkirk of Douglas; Baroness Sheehan; Earl of Stair; Viscount Ullswater; Lord Young of Norwood Green.

Evidence Session No. 2 Heard in Public Questions 21 - 43

Witnesses

I: Silke Goldberg, Partner, Herbert Smith Freehills LLP; Robin McCormick, General Manager, SONI; Dr Owen Wilson, Chief Executive, Electricity Association of Ireland.

II: Dr Jenifer Baxter, Head of Energy and Environment, Institution of Mechanical Engineers; Dr Mina Golshan, Deputy Chief Inspector, Office for Nuclear Regulation; Angela Hepworth, Corporate Policy and Regulation Director, EDF.

Examination of Witnesses

Silke Goldberg, Robin McCormick, Dr Owen Wilson.

Q21 **The Chairman:** Welcome to this evidence session on our inquiry into Brexit and energy security. I will go through some housekeeping points. Clearly this is an open meeting. It is being webcast and we will also be preparing a transcript. We will be circulating that to you and if you feel we have made any mistakes on it, please let us know. If during this conversation you feel we do not cover everything that you wanted to say, we are able to take further written evidence from you. We would be very pleased for you to send that to our Policy Analyst or Clerk. Could I remind Members of the Committee to declare their interests in relation to this subject, should they have any, before they speak? I will declare a possible connected interest as a trustee of the Green Purposes Company Ltd and Regen SW, although I do not think that either of those has any interests in Ireland. Could I ask the witnesses to introduce themselves briefly, not just for us but for those who are listening in? Dr Wilson, could I ask you to start?

Dr Owen Wilson: My name is Owen Wilson. I am Chief Executive of the Electricity Association of Ireland. It is the representative body for generators, suppliers and distributors on the island representing about 90% of generation and supply activities and both distribution companies. I am also a former executive board member of EURELECTRIC, the industry association at European level, and Vice-Chair of the Brexit working group. You spoke with the Chair last week.

Robin McCormick: My name is Robin McCormick. I am the General Manager of SONI. SONI is the electricity system operator for Northern Ireland. Our parent company is EirGrid based in Dublin. We run an integrated business and my role in the wider business is director of operations planning and innovation, so I am responsible for the real-time operation of the system in Ireland.

Silke Goldberg: Good morning. My name is Silke Goldberg. I am a Partner specialising in energy law with Herbert Smith Freehills LLP. I am a solicitor admitted to practise in the Republic of Ireland as well as England and Wales. I specialise in particular in downstream electricity and gas markets across the European Union, specifically in England and Wales and Ireland. The views I am expressing here are however my own.

Q22 **The Chairman:** Thank you very much. The reason we have a particular session on Ireland and energy security is because we have a unique situation here: not just a land border but a Single Electricity Market between two EU current members. I would start off by asking very generally what the implications of the UK's withdrawal from the EU for Northern Ireland's energy sector are and where is energy security at the present time? We will move on to the Republic later, but we are interested in your view of Northern Ireland's energy security to begin with.

Robin McCormick: Could I give a brief overview of what is happening in Northern Ireland? We are part of the Single Electricity Market at the moment. In May 2018 a new Integrated Single Electricity Market will be introduced, so we are testing systems, bedding in software and are about to run a market trial. The May I-SEM go-live date is an absolutely critical business milestone for us. That introduces a better market on the island than currently exists. The market has three elements: an energy payment, a capacity payment and revenue to generators for systems services. On the island of Ireland we have some rain and lots of wind and from that wind we generate lots of electricity. However, we are a small island and there are all the technical challenges around integrating wind. We would consider ourselves to be world leading in that respect. That is all tied into the market that is being developed and how we run the system. Both Governments have set a 40% target for renewables on the island by 2020, so there is a lot of activity in renewable energy on the island.

The deadline for the I-SEM is May 2018 and for that to work properly across the island we need more infrastructure to link the northern transmission system with the southern transmission system. What we call the North-South Interconnector is currently in planning in Northern Ireland. It has planning approval in the south of Ireland and we are waiting to try to progress that. In doing so, that will make the island much more like a single transmission network. The lack of it means that there are some traffic jams on the electricity motorways and that is not beneficial to customers. If we clear that, it solves the market problem and solves the security of supply problem that is coming to fruition in the early 2020s, where some of the generators in Northern Ireland are due to be withdrawn from the market because of emissions issues, et cetera. I hope that gives you a little flavour of where we are on the island.

We will have the I-SEM up and running by May 2018. The question is: what impact will Brexit have on this new market arrangement? Our position would be that the arrangements that we are putting in place are for the benefit of customers right across the island. There is not a reverse gear in the market, so we are going to have to move forward, and if there are any amendments that we have to make to the way we trade across the interconnectors, that would be probably where the activity would take place.

The Chairman: For my benefit, could you very briefly explain the difference between the current Single Electricity Market and the Integrated Single Energy Market? What are the key differences and are they significant?

Robin McCormick: The Single Electricity Market was introduced in 2007 by a co-operative working together of two Governments, two departments, two regulators and two TSOs. It was quite a significant flagship project which demonstrated that the peace process was working. It was to address a capacity shortfall that was starting to show itself particularly in the Republic of Ireland. There had been a number of

different ideas brought forward to solve the problem in the Republic of Ireland. The opportunity came to introduce an all-island market. It is very much a rule-book market. The bid price that you bid into the market is done on the basis of what is described as your short-run marginal costs, so it is a formula that the regulators can keep an eye on. It has a capacity mechanism as well. It has worked very efficiently. It has avoided a perception that some of the big players were taking over the market. The market participants believe that it has been a success. There has been evidence of that by investment in generation capacity. The new market is really similar to the market that operates across most of Europe. It is a much more active and competitive market and operates on a number of different timeframes. You can buy energy a day ahead, within a day or within minutes of needing it through the balancing arrangement. The current arrangement is all a day-ahead market. That was amended a little to help interconnectors improve their trading. It is an overall Europe-type market with links into Europe to see the overall flow of electricity and to give each market participant the opportunity to trade wider than just on the island.

Dr Owen Wilson: To clarify, the significant difference is that the existing market is a mandatory pool similar to the original GB market whereas we are moving to something similar to today's BETTA arrangement.

Silke Goldberg: If I may supplement that from a legal perspective in terms of the impact that Brexit may have on Northern Ireland specifically: Northern Ireland through the SEM—or the I-SEM from 23 May of next year—is integrated with an EU country which will continue to be subject to EU regulations, such as network codes in particular that govern how electricity, and indeed gas, is allocated at interconnection points, so where the Northern Irish electricity and gas systems meet the Republic of Ireland's electricity and gas systems respectively. The way that is governed under the EU codes, should they no longer apply in the same way in the north of Ireland, will have an impact from an operational perspective. There are a number of legal questions around, for example, the continued participation of some of the Northern Irish institutions in European institutions such as ENTSO-E, the European Network of Transmission System Operators for Electricity, which is the entity that sets up and agrees European network codes. Prima facie, as a non-EU Member State, a UK representative would not have immediate access to that and a special agreement would need to be made or found to allow for continued co-operation in that context. Obviously that applies to Northern Ireland as well as GB market regulators and TSOs.

The Chairman: Is it your opinion that the Integrated Single Electricity Market—and we are equally interested in gas—will be able to operate post Brexit? Is there any question that it can or cannot?

Dr Owen Wilson: As of today, under current EU law, there are no fundamental restrictions to it continuing to operate. However, it is dependent also on the nature of a future trading agreement between the UK and the EU. The form and content of that, as to whether it provides

for continued market coupling between Northern Ireland, at a minimum, and the EU, and the elements that facilitate that, including equivalence of energy markets and environmental law, already exist as of today. We have noted recently in an agreement between the European Union and Switzerland in relation to the coupling of the emissions trading systems between both that a novel mechanism to address disputes has been agreed which could, in essence, form the basis of a similar arrangement in the context of a continuation of the SEM.

The obvious challenge will be going forward as policy and legislation diverge, and as the EU introduces legislation to address the consequences of Brexit, whether that can at some point, either advertently or inadvertently, result in the discontinuation of the SEM or the inability of the regulatory authorities and TSOs in the Republic of Ireland to continue to participate in the market. Clearly, it will be a requirement for the relevant government departments in the Republic, the TSOs and CER to address that situation should it arise.

I would say that the industry fully supports the continuation of the Single Electricity Market and the advantages, both economic and political, which you have adverted to previously, that arise from that.

Silke Goldberg: From the legal perspective there is no obstacle per se for the SEM—and the I-SEM—to continue as it is at the moment. I would add that the SEM is predicated on both Northern Ireland and the Republic of Ireland being subject to EU rules, and those may diverge. Energy is not fully devolved to Northern Ireland and there is the possibility of some unintended or intended interference following policy choices that may be made here in London, as has been the case on some occasions in the past—for example, the carbon floor price and the impact on SEM trading. It is more of a pricing impact than a legal impact, but I would suggest that both elements would need to be taken into consideration.

The Chairman: The devolution issue is important to remember.

Robin McCormick: From a practical perspective, the I-SEM will be up and running in May 2018. It is a single market and all the investments that have been made have been made on the basis of a single market, whether from a generation perspective or a supply perspective or the new technology that may be adopted to meet the needs of the island. To do anything different from that is a huge step practically and from a cost-to-consumers perspective, anything that you do to the new arrangements will cost money. That will be reflected back on the bills of the customers in Northern Ireland and the customers in the Member State, Ireland.

Q23 **Viscount Hanworth:** How consolidated or dispersed is the ownership of the electricity generating capacity both in Northern Ireland and the Republic? The reason for that question is it relates to the difficulties that will arise in market coupling in the absence of a fully realised I-SEM. It is a question of the structure of the industry.

Dr Owen Wilson: The structure of the industry is diverse at the moment. There are five large generating companies. Obviously, the original incumbent in the Republic of Ireland, the Electricity Supply Board, retains the largest market share, but that is of the order of 40% to 45% on the generation side. It is dispersed and ownership is also dispersed. Outside of Ireland there are a number of UK utilities which are also active in the generation market within the Republic of Ireland and obviously American utilities are engaged in Northern Ireland. I guess the real issue boils down to the ultimate size of the Northern Ireland market in the event of disruption to the I-SEM and whether it can continue to function with the same arrangements in place. It would appear likely, given its size and relatively low level of interconnection to GB, and the constraints that apply on further interconnection to GB, that a review of the structure of the wholesale market would be required were that to happen.

Lord Young of Norwood Green: As a matter of interest, is the interconnector going to be overhead or underground?

Robin McCormick: It is an overhead line. That is the technology that has been chosen and the planning application has been on the basis of an overhead line.

Lord Young of Norwood Green: On the point you made about competition, the paper from the House of Commons said that you are expected to build on success in delivering increased levels of competition, which you have said. Is that because of the flexible arrangements that you described previously, that you can book a day ahead or on the day? Is that part of it?

Robin McCormick: That is a significant part of it. It allows much more flexibility in the way that generators and supply companies do business. One of the biggest impacts of the new market is that the arrangements provide an opportunity for more efficient trading on the two interconnectors that link the island of Ireland to GB. At the moment they are not particularly efficient trading arrangements and the mechanisms that are being introduced allow for real coupling between the island of Ireland and GB and beyond.

Lord Young of Norwood Green: I have one final point. Is it right that you only generate 15% of total power capacity in the Republic? We are told that 85% is supplied. Is that figure right?

Dr Owen Wilson: No.

Lord Young of Norwood Green: What are the figures?

Dr Owen Wilson: Currently the Republic of Ireland is a net exporter of generation to the UK, or parts of the UK, so it is 100%. In terms of imports, about 5% of total demand relies on imports from the UK and about 2% from Northern Ireland.

The Chairman: We will come on to this in the next question. Baroness

Sheehan, you had a question.

Baroness Sheehan: My question is about the North-South Interconnector. You mentioned how important that is to realising the I-SEM in May 2018. The planning permissions are in place. What is holding up progress and how quickly do you need to be able to get on with that to meet the timeframe?

Robin McCormick: The planning process for any major infrastructure project tends to be lengthy and it has proved to be the case with this one. The original expectation was that this would be built and up and running in 2012, but there have been a number of hold-ups both in the Republic of Ireland and in the North of Ireland. We now have planning approval in the south and are waiting for planning approval in the North. That is expected to be before the end of the year. Depending on the political arrangements in Northern Ireland, we will have to work out who makes the decision as to whether they are going to move on that. It will probably take three summers to build the project. The issue in Northern Ireland is whether it will be built before some of the generators withdraw their services from the market. That is where the security of supply issue stems from. If we can get the project built, we will not have a security of supply issue. If we cannot get the project built or there is a significant delay, we face a generation shortfall and we do not have any certainty around the investments that would be required to fill the gap. At the moment the interconnector is a bottleneck. We cannot be perfectly efficient in the way that we dispatch our generation, so we have to run more expensive generation on one side of the interconnector because we cannot flow enough energy through the interconnector from south to north. When we build the new one all those restrictions will be gone, so it is a really significant infrastructure project for the island.

The Chairman: We will come on to the interconnector later. Baroness Sheehan, do you want to move on to your own question?

Q24 **Baroness Sheehan:** To what extent is Northern Ireland reliant on imported energy from the British mainland or elsewhere for its energy security?

Dr Owen Wilson: In looking at total energy supply I think Northern Ireland is about 89% dependent on fossil fuel imports of coal, oil and gas. Eleven per cent of its energy requirements are provided through indigenous renewable generation; about 27% in electricity and 3% in heat. In terms of oil, coal and, to a large extent, gas, whether there will not be an impact consequential to Brexit. Depending on whether the I-SEM continues post-Brexit; in the event it does not, additional generation will be required in Northern Ireland. With the UK government policy in relation to coal that will, of necessity, be gas and the capacity to supply gas to Northern Ireland to meet that will require further investment in compressor facilities in Moffat. As Robin mentioned, Northern Ireland currently imports a proportion of its electricity from the Republic. At the moment that import facility significantly underplays the prospective demand for supply from the south to the north. Currently, it represents

about a third of the capability to deliver power to Northern Ireland due to the lack of this second interconnection, which demonstrates the importance of that. The issues regarding security of supply can be addressed but they will require further investment, and it relates primarily to gas.

Q25 **Viscount Ullswater:** In the broader context of Brexit, how could the land border on the island of Ireland or decisions about the movement of workers affect energy security in Northern Ireland?

Silke Goldberg: It is relatively hard to quantify. At the moment free movement between the six counties and the 26 counties basically means that there is free movement of labour. People are employed either in the North or in the Republic to work on energy projects and various energy generation and market-operator companies. To the extent there were to be restrictions, I imagine that travelling and free movement would be made operationally much more difficult. I know there are political connotations in relation to that on the island of Ireland, but perhaps there is a parallel with North Sea platforms. Oil and gas platforms in the north rely very heavily on talent regardless of their nationality background and such controls might make it more complicated for either the north or the Republic to attract corresponding people from either the north or the European Union.

Robin McCormick: Practically, it will impact any business that operates in an all-Ireland context. Our business does that. I was in Belfast on Sunday, Dublin on Monday, London on Tuesday and I will be in Dublin on Wednesday. That is the way it works, so any restriction to that has some sort of impact, whether it is hassle, time or money, or all three. It is the practical implications of any movement of people. There are probably lots of other examples where there will be more of an imposition than on our particular business.

Dr Owen Wilson: I would add that in Northern Ireland utility activity represents about 3% of total utility activity in the UK. I would say that a pre-existing pool of labour is present to address most of the specialist operations and maintenance needs that would be required. Clearly, the issue of cross-border interaction within companies is significant. I guess addressing the common travel area will resolve that. The only challenge that might arise in the future is in relation to new investment and the requirement for specialist technical expertise in the development of that and the commissioning of such infrastructure.

The Chairman: Before I bring Lord Rooker in, one thing that strikes me about this is that it is quite likely that the common travel area arrangement will continue and negotiations between the EU and ourselves seem to have got quite far on that, but that does not work for Republic companies in the energy industry which employ other EU citizens who you would expect to work in Northern Ireland. That becomes a problem, does it not? It is not just specialists. One thing that we have come across in many of our inquiries is that even though many people may not be thought to have high skills, they are important skills in these

professions and industries and are not easily replaceable. Is that a barrier?

Dr Owen Wilson: I do not think it is a major barrier. As you are aware, Northern Ireland does not have any nuclear generation facilities so the particular specialist expertise required in relation to that is not needed. As I said, there would be a pool of expertise residing in GB that could be drawn on and is drawn on to fulfil operations maintenance requirements within Northern Ireland today.

The Chairman: I have this vision of your Czech employees having to get out of the van at the border and the Irish nationals continuing.

Dr Owen Wilson: That will depend on the nature of the arrangement at the border. I think that is a consideration that will require to be addressed under the common travel agreement.

The Chairman: Lord Rooker.

Lord Rooker: That was really my point, to be honest. I wanted to be clear that your answers did not apply to the citizens of the UK and the Republic, who speak the same language and who have the freedom to live, travel, work and vote in each other's countries. None of that is going to change. It is the other Member States' citizens. I just wanted to be clear about that, but I think that came out in your second answer.

Dr Owen Wilson: As you will be aware, the Republic of Ireland is not a participant in the Schengen agreement, along with the UK, so there are passport controls on entry into the Republic of Ireland in relation to EU citizens.

The Chairman: If we could then move on to Lord Krebs and the British position statements.

Q26 **Lord Krebs:** As you will know, the Government's position paper on Ireland argues for a continuation of the Single Energy Market post Brexit supported by existing bodies such as the SEM operator. There is essentially no change. Do you think that is realistic? Do you think that the Government's approach reflects the best interests of the whole of the island of Ireland or just the north?

Silke Goldberg: From a legal perspective, there is no obstacle against the SEM or I-SEM continuing. There is no role for the European Union per se in the operation of SEM. It was predicated, as I mentioned earlier, on a number of European Union operational rules, such as the network codes and the European target model and that will also be reflected in the I-SEM arrangements. From a purely legal perspective I do not see that the continuation of the SEM would be at risk. However, given that there might be a number of perhaps unintended operational consequences, from a legal perspective it may be preferable to put the operation of the SEM and I-SEM into an agreement between the UK and the Republic of Ireland in relation to energy. There are a number of political implications, and I am in no position to comment on those, but from a legal

perspective it would be a relatively straightforward way to put together an agreement specifically for the energy sector for the island of Ireland. That would have very little impact in relation to the EU 26 and would help address a number of legal and operational issues that would specifically concern the SEM and I-SEM.

Robin McCormick: It is important and very helpful that the UK Government have indicated their support for the Single Electricity Market through Rt Hon James Brokenshire MP and Rt Hon David Davis MP, who have stood together in our control room in Belfast while the whole set-up has been explained to them. I think that is important and it is a question of how that comes to fruition in the negotiations that are being undertaken now. The arrangements do benefit customers in Northern Ireland and they benefit equally customers in the Republic of Ireland.

Dr Owen Wilson: I would add that, as you will have noted, the European Commission's paper in the last fortnight also emphasised the importance of maintaining the Single Electricity Market. With a positive will on both the UK and EU sides and the absence, at present, of any insurmountable legal obstacles, the prospects of delivering it are positive.

Lord Krebs: To make sure I understood it, from what you said, Robin, the approach would benefit both customers in the north and in the Republic of Ireland so it is of benefit to the whole of the island of Ireland?

Robin McCormick: Yes. That has been shown to be the case with the arrangements up to now and it will be increasingly the case with the new arrangements.

The Chairman: Do you have a constructive relationship with DExEU—the Department for Exiting the European Union? Are they in good listening mode?

Robin McCormick: I think we have had more opportunities to talk in the current political climate where the Executive is not functioning. To get the information required has required some agility from the politicians.

The Chairman: That is good news. Earl of Stair, we have covered a bit of your question but I do not think we have gone enough into the second part.

Q27 **The Earl of Stair:** I was going to ask you about the feasibility of the Integrated Single Electricity Market, but, as the Chairman has just said, we have covered a lot of that. What changes would we need to make to the current governance agreements on the devolved aspects of the interconnectors and the powers? Are there going to have to be new negotiations on the devolution aspects of the policy?

Silke Goldberg: Possibly. It will depend what the arrangement between the UK and the EU 27 looks like. As I said earlier, there is no current law that would impede the continuation of the SEM or, indeed, the I-SEM arrangements as they are right now. However, there is a constitutional aspect for Northern Ireland. To the extent that the UK will no longer

implement EU directives or apply EU regulations, but the Republic of Ireland will, there is a question in I-SEM or SEM as to how these will be implemented vis-à-vis the north. The question would arise as to whether the Westminster Parliament would adopt the relevant legislation and transpose it with a view to it only being applicable in Northern Ireland, or indeed would there be further devolved powers in relation to the application of the relevant directives and regulations in the North of Ireland. That is very much a political question but from a legal/constitutional perspective that is the question that is of prime importance vis-à-vis the operational rules.

The Earl of Stair: It will need to be addressed.

Silke Goldberg: Just to summarise, the SEM per se does not need any governance changes as a result of Brexit, in my view.

The Chairman: Could you remind the Committee what energy powers are devolved to Northern Ireland when it has a functioning Administration?

Silke Goldberg: The co-operation obviously is devolved and the Executive is involved in the discussions with the Republic. However, a number of broader energy powers—the carbon floor price is the prime example—also have an impact. There are a number of UK-wide powers that remain in Westminster where because they have a broader impact beyond the GB market they will have an impact on Northern Ireland.

Dr Owen Wilson: I would add that the relevant environmental powers are also devolved, which would appear to be important from an EU perspective.

Lord Curry of Kirkharle: I have a brief supplementary referring back to Robin's earlier comments. You said that there had been significant delay in the planning process to get your infrastructure in place on the interconnectors. Is there any sense that the current uncertainty surrounding Brexit and the negotiations, et cetera, are having an impact on confidence in terms of the investment required to deliver the programmes that you have outlined?

Robin McCormick: I think that is a very, very good question because we are moving from a very well-received Single Electricity Market to a new Integrated Single Electricity Market, and that creates a level of risk and uncertainty to investment in generation and other technologies, so to overlay Brexit on top of that creates another dimension. If there are any proposals that cross the date at which Brexit is about to happen, that creates uncertainty, maybe more uncertainty in Northern Ireland than in Ireland. That is my take on it.

Dr Owen Wilson: I would confirm that the lack of certainty and clarity in relation to key aspects of Brexit is today impacting on investment decisions by operators in Northern Ireland.

Silke Goldberg: Again from the legal perspective, I regularly advise clients on large electricity or gas projects, and bankability and certainty go hand in hand. Any form of uncertainty, legal, regulatory or otherwise, will by definition add to question marks in relation to projects and therefore add to further insecurity about investment.

The Chairman: Thank you for that important question.

Robin McCormick: Obviously, the anticipation of getting the North-South Interconnector or a delay will affect the investment climate for generation, which is very important for Northern Ireland. The greater clarity that can be given, the more chance there is that we can avert any security of supply issues in Northern Ireland.

Q28 **Lord Selkirk of Douglas:** I would mention an interest as the Chairman of a small family company which has land holdings in the west of Scotland and planning permission for one turbine. Which body or bodies currently have the jurisdiction to hear disputes arising under the Single Electricity Market? Who has the standing or relevant interest to bring disputes? After Brexit how might similar disputes be resolved? For example, would legislation be necessary or not?

Silke Goldberg: Could I answer that question from a legal perspective? Any dispute in relation to the SEM is addressed first and foremost through the Dispute Resolution Board set up under the Trading and Settlement Code of the SEM. Any party that wishes to trade or participate in the SEM is required to sign up to the Trading and Settlement Code as a pre-condition. Without doing that they cannot participate. Therefore, any party signed up to that code, plus the operator and any of the regulators, has standing under that code. It could be a bilateral dispute. It could be a dispute between two trading parties. It could be a dispute between the SEM operator and a trader. There are a number of possible permutations. In the first instance, all those disputes would need to be referred to the Trading and Settlement Code Dispute Resolution Board. I believe the details of that are set out in Appendix 14 of the Trading and Settlement Code.

Regarding jurisdiction, the code itself is governed by the laws of Northern Ireland. At the same time the courts of Dublin and Belfast have been given jurisdiction. However, referrals to the court are only possible under the Trading and Settlement Code once the Dispute Resolution Board avenue has been exhausted and no resolution has been found. Is any change necessary? In my view, no, because this is a private agreement at the end of the day. From a regulatory point of view I do not see any particular reason why that would need to change.

Dr Owen Wilson: I would add that, at a higher level, decision-making within SEM is undertaken by the Single Electricity Market Committee—the SEM committee—which is a joint body established under legislation in Northern Ireland and the Republic of Ireland with representatives from both regulatory authorities plus an independent member and a deputy independent member. They are the decision-making authority. The

decisions they take are required to be implemented by the regulatory authorities. While in principle there are no governance issues arising in relation to SEM that would upset that, I think further consideration of those governance arrangements in terms of accountability and appeals would be beneficial.

The Chairman: Is there any conceivable set of circumstances in which the European Court of Justice would be involved in any decision?

Silke Goldberg: Possibly. Circumstances might arise where European Union law would be applied, such as the circumstances I have described in answer to a previous question, in particular in relation to interconnectors. To the extent that the Republic and the north are interconnected from an electricity or gas perspective, interconnection points are governed by the European network codes. Ultimately, disputes could be referred to ACER, the Agency for the Cooperation of European Union Regulators in Ljubljana, the European Union energy regulator. Ultimately, they could be referred to the ECJ to the extent there was some dispute as to the application of the law.

That leads to a legal issue in relation to what constitutes an interconnector for European Union law purposes. I will not go into all the details. With your permission, I will submit a written answer to that particular aspect. Suffice to say, the answer is different for electricity and gas. It may well be that the spur from the Moffat interconnector that goes into the Republic no longer qualifies as an interconnector for EU purposes. In electricity that issue does not arise.

Robin McCormick: It is probably worth noting that there are interconnectors between GB and mainland Europe that have exactly the same issue to resolve.

Lord Selkirk of Douglas: Would I be correct in thinking that most issues can be resolved without the need to go to court either in Dublin or Belfast?

Silke Goldberg: Even though I am a lawyer, and people sometimes suspect lawyers to be very litigious, by and large parties to a dispute want to avoid going to court and most issues are indeed settled by alternative dispute resolution mechanisms way before they reach the courts. There are certain circumstances where that is unavoidable, but it is not the case that the energy industry is particular litigious so that issues need to go to court.

Q29 **Viscount Hanworth:** What would be the consequences of not maintaining the I-SEM market for energy security, domestic generation and consumer costs? While I am at it, might I ask what are the reasons for the considerable delays in constructing a North-South connection?

Robin McCormick: Let me start with the second part of your question. Any infrastructure project, whether it is on the GB mainland, in Northern Ireland or in Ireland, tends to be problematic and is all down to social

acceptance of an infrastructure project. People tend not to like infrastructure that is built on their property.

Viscount Hanworth: Big pylons on their property.

Robin McCormick: There have been groups of people who have objected to it legitimately and there have been forums for their objections to be aired. There have been a number of independent reports requested by the Irish Government to provide some clarity around issues of health, the impact on tourism and the equine industry, and the costing of an overhead-line solution versus an underground solution. The main issue has been generally that the people who object to it do not object to the need; they object to the solution. They would like it to be undergrounded and the undergrounding solution that has been put forward is a high-voltage direct current solution, which is a different technology than is used on the rest of the island's electricity network and from a system operator point of view is not an acceptable solution.

Viscount Hanworth: The issue has been on the ground rather than between the Governments?

Robin McCormick: It has been on the ground but it has become more of a political issue in Ireland than in Northern Ireland. It has gone through the normal processes of An Bord Pleanála and been approved. There has been a judicial review and there is a further judicial review to be completed in October. In the North the decision should be made by the end of the year and if there is a Minister for Infrastructure they would be in a position to move the project on. We are getting closer to a point where the interconnector can be built.

Viscount Hanworth: What are the consequences of failing to realise the I-SEM?

Robin McCormick: My point on that is that the I-SEM will be realised, so the issue is the consequences of any change to those arrangements once it is implemented. A minor change retaining the integrity of the I-SEM market but amending the context in which it is operating is less difficult and less costly. If you have to move from the I-SEM to something different, that is hugely difficult, immensely costly and detrimental to customers on the island.

Dr Owen Wilson: I would add that in terms of Northern Ireland standing alone, as it were, obviously there is much less efficient dispatch in a substantially less liquid market, or almost an illiquid market. There would be requirements for Northern Ireland operators to retain a higher capacity, so less efficient capacity management on the system and the costs associated with both of those. There are obviously increased opex costs for the system operators in splitting the systems and for market participants operating in both markets. All that leads in turn to a point we made previously: a less-attractive investment market for Northern Ireland and consequently generally higher costs all round.

Silke Goldberg: As we were referring to earlier, there is the need from 2021 onwards of about—and I will stand to be corrected—200 megawatts of additional capacity that will be required as existing plant retires.

The Chairman: Can we move on to a rather more Republic focus? Lord Rooker.

Q30 **Lord Rooker:** I have a small interest to declare. I am an unpaid Director of Ludlow Hydro Co-op in Shropshire where we operate an Archimedes screw on the River Teme. We are not generating much at the moment because there is not much rain in Wales. Nevertheless, that is that out of the way. I want to ask you about the extent to which the Republic is dependent on the UK for gas, electricity and energy and to follow up one of the points that Lord Young raised earlier on. Part of our briefing includes a Chatham House paper, *Staying Connected,* in which there is a written piece by Eamon Ryan, former Energy Minister, in which he says Ireland still imports 85% of its energy, mostly from the UK. Some people are claiming, we understand, that this strengthens the UK in its Brexit negotiations, ie the dependence of the Republic on the UK. Earlier on you gave us figures which show that 85% is not correct, so what is the extent of the Republic's dependence on the UK for supply of energy?

Dr Owen Wilson: For clarification, the figures I gave previously were in relation to electricity. Maybe I misunderstood the question. Yes, I think 85% would be a relatively accurate figure, but that applies across the board to all energy products, in particular oil, which would be the dominant fuel, and perhaps to a lesser extent coal. For neither of those do I foresee any consequences arising as a result of Brexit. They are governed under WTO rules so the risk of interruption to those would be limited. There are obviously issues in the context of security emergencies which may arise.

In relation to gas, in 1995 Ireland had a 3% dependency on imported gas, mainly LNG. By 2014, that had risen to a 97% dependency on imports, but by 2017—today—it is back down to a 40% dependency on gas imports as a result of the development of the Corrib natural gas field and the development of electrical interconnection where electricity is substituting for gas. That dependency in future in relation to gas will obviously be related to future gas developments and exploration in the Republic of Ireland and its ocean territories. It will also be dependent on the extent to which renewable energies in the electricity and in particular the heating sector are developed. It is anticipated that they will be in the near future again reducing dependency on imported gas, but it is somewhat of an imponderable. The policy around shale gas, for example, in Northern Ireland would be relevant there. As I previously mentioned, currently the Republic of Ireland is a net exporter of electricity to the United Kingdom, both to GB and Northern Ireland.

Silke Goldberg: May I supplement that? In relation to gas in particular, I think it is important to look at the relevant timeframes here. Dr Wilson is correct in pointing out the role of the Corrib field in reducing the immediate import dependency of the Republic on the UK gas market. As

far as I understand the figures prior to the Corrib field coming on stream in the winter of 2014-15, import dependency was around 86%, 89%, nearly 90% depending on how some of these figures are read and the particular peak demand times. I understand that the Corrib field itself has brought that down to about 56% for the past winter. However, the Corrib field has a relatively limited time period in which it will be exploited. I understand there is about 10 years of life left in the Corrib field. Likewise, the Inch field, which is also an indigenous field in the Republic, will come to an end in due course. Those particular circumstances would continue to expose the Republic to further import dependency.

I also understand that there are some imports that while coming through the Moffat interconnector do not come from UK offshore fields. They come from further afield, places such as Norway and other sources. The particular issue there will be to what extent these pass-through arrangements will be able to subsist in a post-Brexit world and in particular whether tariffs are imposed in relation to gas. This scenario will become particularly relevant in the case of a hardest Brexit, meaning that the UK leaves the European Union without any follow-on arrangement as to its future relationship and falls back on WTO terms and conditions.

The relevant tariff for electricity under the most-favoured nation status is 0%, so it is less of a concern in relation to tariffs being applicable for the functioning of the I-SEM in the future. However, for gas, while there is an applied tariff of 0% at the moment the other issue is there is a band tariff for gas, so the level to which tariffs could in theory be applied is 0.7%. If tariffs were to be applied that would need to be taken into consideration in the supply security for both the North and the Republic in terms of any pass-through arrangements.

On the topic of tariffs, we have not discussed supply security from a maintenance perspective. At the moment, the scenario is that no tariffs will be applied in any particular part of the industry. However, there is the possibility that in the case of a hardest Brexit, tariffs may be imposed on certain widgets that are necessary for the maintenance and operation of pipelines, electricity cables and any of the additional tools that are operationally necessary.

The Chairman: That is useful to understand.

Lord Young of Norwood Green: When you import gas, is it all LNG?

Dr Owen Wilson: No, it is a gas pipeline.

Lord Young of Norwood Green: There is a gas pipeline. What is the proportion between the pipeline and LNG?

Dr Owen Wilson: There are no large-scale LNG facilities in the Republic of Ireland, so in the context of large-scale LNG it is zero, but there are proposals in that regard.

Lord Young of Norwood Green: I have one final point: what is the current policy on shale?

Dr Owen Wilson: In both jurisdictions there is a moratorium on development.

Lord Young of Norwood Green: Thank you.

Lord Rooker: I am going back to the former Energy Minister's point at Chatham House. Would it make sense for these two offshore islands, the Republic and Great Britain, offshore from Europe, to fully integrate their energy supplies and distribution?

Dr Owen Wilson: The purpose of the energy union was that the whole of the continent would integrate. There is mutual advantage in integrating Ireland with the UK and the UK with Europe. I think that is one of the most important factors in the context of addressing future energy trading agreements between the UK and the EU. Certainly, the direction of travel in the electricity sector—it may be a little less slow in the gas sector—has been towards that market coupling.

Robin McCormick: The context is that the European model has moved from a regional market to an all-encompassing European market and as you do that you get marginal benefits. You do not want to break up the regional market on the island. You can couple the regional market on the island with the GB market, which is coupled to the wider European market, and that model retains a huge percentage of the benefits of the market, but it has to be underpinned by arrangements and agreements as to how they work.

Lord Rooker: The consumer benefits that way?

Robin McCormick: The consumer benefits. I have history; I was in Northern Ireland when there was not an interconnector functioning, and the lights went out for some people every month because we had a small number of generating units and the cost of carrying reserves was such that we had to find a balance. When the interconnector came back into play that kept the lights on in Northern Ireland. That monthly routine of people being off supply because a large generator had tripped has gone away and people have come to benefit from that obviously. The benefits of interconnection and integration are clear to everybody.

The Chairman: I particularly want to make sure we give some time to funding and we have our next session in a while, so could we move on?

Q31 **The Earl of Stair:** Can we stay with interconnectors and Brexit? What might be the effect of Brexit on either the planned or currently operating interconnectors between the United Kingdom and the island of Ireland?

The Chairman: Are there any additional points?

The Earl of Stair: We have covered a few points on that.

Dr Owen Wilson: When we are talking about interconnectors in the future, it is purely electricity interconnectors. That is understood. In the context of those, it relates to the risk that Brexit creates regarding the

nature of the future trading arrangements between both entities. In the ultimate form of Brexit, I am not sure whether the economic case for those will continue to exist. As you will be aware, there are some planned additional interconnectors between the Republic of Ireland and Great Britain. There are also proposals for an interconnection between the Republic of Ireland and France. In the context of EU funding, it would be more likely perhaps that that would receive EU funds than a GB/Republic of Ireland development. Regarding operation, it goes back to the points made previously around the efficiency of trading that can happen and that is in turn based on that future agreement.

Silke Goldberg: I would make a couple of legal points in relation to governance. The governance of future interconnectors will need to be taken into consideration in particular with regard to treatment of interconnection points. You mentioned the availability of funding and presumably that would be from the European Union because it is the Connecting Europe Facility that is made available to projects of common interest. While, technically, projects of common interest apply to connections between two Member States, projects of common interest are governed by EU Regulation 347/2013. There is a particular paragraph that explains that while generally it applies to two EU Member States, to the extent that a projected interconnector has a positive impact on the European electricity or gas market, as the case may be, the status of PCI may be retained. In my view, that would mean there is an argument that continued funding under the Connecting Europe Facility ought to be available for Northern Ireland and Republic of Ireland interconnectors because, in any event, as has been demonstrated by the various arguments here, there is a positive impact on the European energy market, in the sense that it has a positive impact on the Irish energy market and, secondly, it would directly benefit an EU Member State as well. Therefore, while it is not entirely certain, there are good arguments for PCI status and Connecting Europe Facility funding to be made available. To give a left-side example, while most projects of common interest are in the European Union, the interconnector from Israel to Cyprus into Greece—Israel clearly is not a member of the European Union—has received project of common interest status and, as such, it is eligible for the relevant funding.

The Chairman: We will come on to those projects in a second.

The Earl of Stair: I am aware that it is planned but is there a practical reason why the interconnector has not been put in between the island of Ireland and France?

Robin McCormick: It is a proposed interconnector, so the preliminary work has been done to assess the feasibility of the project and that has gone ahead at speed. Because of the Brexit issue it has become a bit of a hot topic because it is connecting two Member States, so the context in which it is being developed is different. There are agreements between EirGrid and its counterpart in France and there have been discussions

between the regulatory authorities, et cetera, on what that might look like, but it cannot be delivered for some time, 2024, 2025, 2026, 2027.

The Earl of Stair: My question was slightly different. Is there a practical reason—the seabed, the distance or any other reason—as to why it has not been done in the past?

Robin McCormick: Probably because it would not have been deemed needed. The business case for it would have become clearer as the market has evolved. Interconnectors are incredibly important. They provide a capacity benefit, so the amount of generation you need in an area is less if you have an interconnector to another system. The European model says to rely on your neighbours where you can. They also allow for trading. If there are trading arrangements, you get efficient trading. For Ireland and Northern Ireland where we have a lot of wind, as I talked about earlier, there are times when you have too much wind generation and the little system on the island cannot cope and in normal circumstances we have to turn the wind turbines down, but we have the opportunity to trade that excess cheap energy off to neighbours who may need it at that point in time. There are lots of benefits.

The Chairman: We need to move on to the last question now and Lord Krebs.

Lord Krebs: I think part of this has been answered in the sense that, Silke Goldberg, you said that PCIs involving Northern Ireland could in principle continue post-Brexit. I think that is what you said.

Silke Goldberg: I believe they can, yes, to the extent that a demonstrable benefit can be shown to the European market, which seems to clearly be the case.

Lord Krebs: The other part of my question is really a more general one: can you give us an estimate of the extent to which EU funding contributes to the construction and maintenance of the energy network in Northern Ireland? Post Brexit, would that need to be replaced by the UK Government?

Robin McCormick: The vast majority of infrastructure in Northern Ireland is funded by consumers in Northern Ireland through the normal tariff process. There have been a small number of projects where there has been some European funding to support it. That tends to be funding on the feasibility of the project rather than any funding of the construction. It is a minority element of the investment picture.

Dr Owen Wilson: There are six current PCI projects affecting Northern Ireland of which two are in receipt or potentially in receipt of Connecting Europe Facility funding.

The Chairman: Thank you very much indeed, Dr Wilson, Mr McCormick and Silke Goldberg. We very much appreciate you appearing before us and giving us a very comprehensive view of the issues. I get the impression that Brexit is not at the top of your risk register from some of

what you have said but clearly there are all sorts of things that could go wrong down the line. I get the impression from our discussions it is not absolutely crucial but, clearly, if it goes wrong it is an extremely serious issue. Robin, do you want to come back and say one sentence on that?

Robin McCormick: We are pleased at the way the Single Electricity Market has been talked about by the UK and we would fully support the continuation of that, but we recognise that we are in a political environment that is outside our sphere of influence, so we are handing it over to you. If I appear confident, that reflects the confidence in the political system that common sense will prevail and we will get a solution.

The Chairman: That really scares the Committee. Without getting into deeper waters, thank you very much indeed for your evidence, which will be an important part of our report. I bring this evidence session to a close. Thank you.

Examination of Witnesses

Dr Jenifer Baxter, Dr Mina Golshan, Angela Hepworth.

Q32 **The Chairman:** We move on to our fourth evidence session on our report on Brexit and energy security and in this session we are specifically looking at nuclear energy and Euratom. Can I go through some housekeeping very briefly? As you would expect, this is an open and public meeting. It is being webcast and is also being transcribed. We will send you a copy of the transcript. If you feel there are any errors in it, please come back to us. If you feel that during the session there were some areas we had not covered that you would like to provide further evidence on, please write in to our policy analyst with that evidence. Can I remind Members, please, to declare any specific interests they have in terms of this session? I would once again say that I am a trustee of the Green Purposes Company and of Regen SW. I welcome you. Could we start by you briefly introducing yourselves so not just the Committee but those listening understand your background? Perhaps I could ask Angela Hepworth to start.

Angela Hepworth: I am Angela Hepworth. I am the Policy and Regulation Director for EDF Energy, so I look after our interests in all policy and regulatory issues relating to energy. Obviously Brexit, and Euratom in particular, are key issues for us at the moment.

Dr Mina Golshan: Good morning. I am Mina Golshan. I am Deputy Chief Inspector and Director for the Office for Nuclear Regulation. I am also responsible for ONR's Brexit programme.

Dr Jenifer Baxter: I am Jenifer Baxter. I am Head of Energy and Environment at the Institution of Mechanical Engineers. I represent a large number of people working in the nuclear industry and I lead on policy and technical advice from the institution around the nuclear sector.

Q33 **The Chairman:** Euratom particularly and the nuclear sector generally has had some interest in the House and it fits well with our energy security study. Could I start off more generally and ask what you feel the implications of the UK's withdrawal from the Euratom Treaty for energy security are?

Angela Hepworth: I should say first that I was very pleased when I saw that this Committee would be looking specifically at the implications of Euratom in considering the implications for energy security. For EDF Energy, the Government's decision to withdraw from the Euratom Treaty is a significant concern. I am sure you know that EDF Energy owns and operates the eight existing nuclear power stations and between them they provide around 20% of the UK's electricity. We are also in the process of building the first new nuclear power station in a generation at Hinkley Point and have plans for follow-on nuclear projects. We are a significant nuclear player in the UK. We very much rely on the provisions in the Euratom Treaty to enable us to operate our existing power stations and for the future construction and operation of Hinkley Point. We rely on the ability that the Euratom provisions provide for us to import nuclear

fuel, nuclear components and to transfer information from the EU and key third countries into the UK. We also rely on our ability to draw on international skills and talent both for our existing operations and for our new-build programme, so any disruption in those arrangements could have implications for security of supply; for example, if there was some kind of component failure in one of our power stations, and there was any delay in our ability to move components in to deal with that. I can provide practical examples of that if that is helpful. From our perspective, it is absolutely essential that the Government put in place replacement arrangements to replicate as far as possible the benefits we have at the moment through membership of the treaty and if not that could indeed have implications for security of supply.

Dr Mina Golshan: All I would say is that from the ONR's perspective there is no direct impact on our regulatory function, but, as Ms Hepworth noted, there may be an indirect implication in that we need to bear in mind that these reactors will have been operating by then for about 47 years or so in some cases and there may be a need to extend their life. In that sense, we would be expecting the licensee to put forward a robust justification for that continued operation and extended life. We would want to see that they have all those elements that Ms Hepworth noted in place and we need to verify that through our own activities.

Dr Jenifer Baxter: I would like to add that not only are 20% of our electricity needs produced from nuclear but this is also low-carbon electricity generation and supports us in meeting the aims of the Climate Change Act. We need to ensure that there is no problem in continuing to do that and that as our nuclear facilities come to the end of life they can be replaced. Euratom has provided the opportunity for the movement of skilled individuals, as well as parts and services, to allow that to happen.

In addition to that, as a nation, we have had the opportunity to input into the development of what happens with the Euratom Treaty and we have had a very significant role as a main nuclear player in Europe. To be able to do that, we have exported our skills and expertise to other countries and we will lose that privilege as we leave Euratom if we do not make sure that we maintain very close connections.

The Chairman: I think that gives us a very good introduction. Could I hand over to Lord Krebs?

Q34 **Lord Krebs:** I should declare an interest as a former member of the Committee on Climate Change which has produced reports on the future energy mix of the UK in order to meet the 2050 target. What I want to ask builds on what Angela Hepworth said about the concerns that EDF has that were echoed by others. If you had to produce a priority list of actions that the Government need to take as a result of leaving Euratom, what would they be and on what timeframe? Angela, you have expressed some issues about movement of materials and skills, and you have said that the UK needs to retain the benefits. Can you unpack that a little and tell us exactly what you think the UK Government should do and how quickly?

Angela Hepworth: As I said, what the UK Government need to do is put in place replacement arrangements to replicate what the Euratom Treaty provides for at the moment. There are a number of different components to that which are interrelated. First, it is absolutely essential that we have a domestic safeguards regime. At the moment, the UK complies with its international obligations in relation to non-proliferation through Euratom, so once we are no longer part of Euratom we need to have our own domestic regime. I know Dr Golshan will be able to say more about the details of that. That is the first thing.

We are going to need to negotiate a replacement agreement with Euratom covering things such as the ownership of nuclear material and our future trading relations with Europe in relation to nuclear materials. We are going to need to negotiate Nuclear Co-operation Agreements with key third countries. That is because at the moment Euratom has its own agreements in place with, for example, the US, Canada, Japan and Australia. Once we come out of Euratom, we no longer have the benefit of being part of those arrangements, so the UK will need to negotiate its own bilateral arrangements.

The UK is going to have to negotiate arrangements for the mobility of workers. Of course, at the moment there are general provisions for free movement as part of our membership of the EU, but the Euratom Treaty also provides specific arrangements dealing with the free movement of people who are needed in the nuclear industry, including those who are needed for the construction of a new nuclear power station. That will need to be addressed.

We are going to need to find ways of continuing to participate in European R&D programmes. We are world leaders in R&D at the moment and need to keep up that engagement. The UK Government will also need to address the export control regime which is a key underpinning of our ability to move nuclear components. The final one on my list is that I very much hope that the UK Government will be able to put in place arrangements for future co-operation on nuclear policy matters.

As you can see, that is quite a lot to get done in the time available and there are some interdependencies between all those. What we would like to see from the Government is a plan and timetable for how those various elements are going to be delivered.

Lord Krebs: Are you suggesting that those seven elements that you say are interconnected need to be in place at the time that we exit from Euratom if we were to have a gap?

Angela Hepworth: If we go through the list, the ones that are absolutely critical on day one are a safeguards regime which is approved by the IAEA. It is imperative that we continue to comply with our international obligations. Future agreements with Euratom and third countries cannot be put in place if we do not have an approved safeguards regime, so that is absolutely critical. Having Nuclear Co-operation Agreements in place with third countries is also absolutely

critical on day one. For example, for the US, if there is not a Nuclear Co-operation Agreement in place between the US and another country, it is illegal for somebody in the US to export nuclear material or even share nuclear information with that country, so that is absolutely critical. Clearly, it would be highly beneficial for the UK to be able to negotiate an agreement with the EU covering the future relationship between the UK and the EU on nuclear co-operation matters and the ownership of nuclear material. You might say that things such as R&D are not essential but, given what is at stake in terms of nuclear R&D within the UK, I would hope that would also be a very top priority.

Lord Krebs: To put it the other way round, supposing the UK Government failed to meet the timetable, so on day one after Brexit in March 2019 the safeguards and trading agreements that you have said have to be in place fail to be there, what would the implications be for nuclear power generation in the UK?

Angela Hepworth: If we failed to have a safeguards regime and Nuclear Co-operation Agreements in place with key third countries, we would not be able to share nuclear components or nuclear information with those countries. As a practical example, if we had a component fail in one of our power stations and we needed to import a part from one of those countries, if we could not do it, it might be the case that we would end up with extended outages at our nuclear facilities or plants out of operation. Again, Dr Golshan will be able to say more about the details, but putting in place a safeguards regime is one of the elements of all this which is most directly in the control of the UK Government. They have the ability to put that safeguards regime in place. They need to get it approved by the IAEA, but that element should be within the UK Government's control. As I say, we would like to see from the Government a clear timetable and plan for delivering all this. If it appears to the UK Government that they cannot get all this done in time, absolutely they need to be thinking about whether there needs to be any kind of transitional arrangement, and we would look for clarity on that sooner rather than later.

The Chairman: Could we give the other witnesses a chance to answer?

Dr Mina Golshan: The key element that needs to be in place as a first element of all these aspects that Angela mentioned is having an agreement with the IAEA, which is usually referred to as a Voluntary Offer Agreement and Additional Protocol. That is effectively the UK's agreement as a country with the IAEA. Given that we are already a nuclear-weapon state it is a voluntary offer. Subsequently the safeguards inspectorate regime, the State System of Accountancy for and Control of Nuclear Material, falls out of that agreement, and of course its establishment falls to ONR. That is the second element that needs to be in place. As Angela mentioned, the third element is to have Nuclear Co-operation Agreements with four specific states.

Dr Jenifer Baxter: There is an element we cannot control about the timeframe. There is not a shared plan B from the Government at the

moment about what will happen. It is likely that what we will need is time more than anything to finalise arrangements if we do not meet the March 2019 deadline. There is an element of what happens in other nations when they agree Nuclear Co-operation Agreements and how long it takes for that to go through their various parliaments and government regimes. That is not in the control of the UK Government and we have to be prepared for what that may mean, particularly for the priority Nuclear Co-operation Agreements.

The Chairman: We will come on to those agreements later.

Lord Rooker: On this point you raised about transitional arrangements, could you give us an answer: do transitional arrangements for leaving Euratom have any connection whatsoever with the transitional arrangements for leaving the EU? Can they be quite distinct? Can one be a lot longer than the other? Do they necessarily have to be the same?

Dr Mina Golshan: I would say that is a matter for the Government to negotiate with the Commission as part of its broader negotiating strategy.

Lord Rooker: Leaving the Euratom Treaty and leaving the EU treaty are quite separate things. I know they have been locked together but they are separate.

Dr Mina Golshan: They are separate.

Lord Rooker: The arrangements that you have already explained across the world for the nuclear family, if I may put it that way, are quite separate to everything else relating to the EU. Therefore, could the transitional arrangements be quite distinct from the Euratom aspect as opposed to the EU trading bloc aspect?

Dr Mina Golshan: I would not want to take a policy view on what the government negotiating strategy should be, but I would say it is down to them to agree what transitional arrangement they want in each of these negotiating elements.

Dr Jenifer Baxter: In theory, you would have to have a safeguards system in place for any trading arrangement to be put in place. There is a connection between what could happen in leaving the Euratom Treaty and how the negotiations happen with trade with the EU 27 thereafter.

Angela Hepworth: You are absolutely right that they are separate treaties. One thing that is the same between the treaties is the mechanism for leaving them. Effectively, the UK Government, at the point that they triggered Britain's exit from the EU treaties, triggered the exit from Euratom and it now follows the same process. As things stand, the UK will leave the EU and the Euratom Treaty at the same time in March 2019. If they want some kind of transitional arrangements, in the same way as they would have to negotiate that in relation to the EU treaties, they would need to negotiate that in relation to the Euratom arrangements because it is following the same exit procedure.

The Chairman: If we have time, we will come back to the transition because it is an important area, if transition is indeed possible, because potentially, from what you are saying, it is the ultimate cliff edge in this particular area. Viscount Hanworth.

Viscount Hanworth: I wish to be clear about this category of irreplaceable components which would be embargoed in the absence of an NCA agreement or whatever. Would this be confined to the core of the reactor, the things affected by radioactivity, or would it extend to the ancillary equipment, pumps, et cetera?

Angela Hepworth: The nuclear supply chain is worldwide. We get our components from a variety of different countries, including a large variety of countries in the EU, and that can be components for any part of the reactor. I have a list here of EU countries from which we get parts for our existing nuclear power stations: Austria, Belgium, Cyprus, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Slovakia and Sweden.

Viscount Hanworth: It is more a question of what would be embargoed in the absence of the agreements that we hope will be in place.

Angela Hepworth: It could be components from across any part of the nuclear site.

Viscount Hanworth: Would that include pumps and control systems and whatever?

Angela Hepworth: It would be that sort of thing. A particular issue that we are conscious of is that, of the eight reactors we have in our fleet, one of them is a pressurised water reactor—Sizewell—and that uses Westinghouse technology which comes from the US. We have agreements with Westinghouse for the lifetime provision of services relating to, for example, maintenance and updating of that reactor. Potentially, it is a matter of components failing and getting access to the expertise we need.

Viscount Hanworth: So the personnel would be embargoed as well?

Angela Hepworth: Yes. As a practical example, in 2010, a seal on one of the heating elements in Sizewell failed. We had to shut down the reactor to be able to deal with that component failure and we got input from both France and the US in the process for fixing the issue with the reactor. It is absolutely critical when issues such as that arise that we can draw on components and expertise from Europe and from the US to fix those kinds of problems and bring the reactors back into service as soon as possible.

Viscount Hanworth: I am trying to measure the level of anxiety and it seems considerable.

Angela Hepworth: I have been asking the same question of the people in our generation business. One issue is that it is not necessarily about

the scale of components or how many components; it is about where the particular component you need, the particular component that is broken, comes from. On a nuclear power station, you can never tell which component is going to be absolutely critical until some issue arises. Whatever the scale, wherever these components are, if the thing that breaks is critical and you need a replacement part as soon as possible then that becomes a critical issue, whether that is in the reactor or elsewhere in the plant

Q35 **Viscount Ullswater:** I think I ought to declare an interest. I am a trustee of a landed estate in Cumbria which has commercial transactions with both Sellafield and NewGen. My question is about the labour force involved in the UK nuclear industry. To what extent is the UK nuclear industry reliant on EU workers? Which roles will the withdrawal from the Euratom Treaty most affect?

Angela Hepworth: For us there are two issues around the workforce. The first is around our directly employed employees. We draw on skills and expertise from a wide variety of different countries. As you can imagine, as a French company it is particularly important for us to maintain mobility between the UK and France, but we draw on skills and expertise worldwide for our workforce. We have done a detailed review of where we get different skills from. As you might imagine, for our direct workforce we draw most on EU workers around engineering skills. I have to say that, for us, the most significant concern from a workforce perspective is the ability of our supply chain to get the people that they need to build the new nuclear power stations. It is the construction workforce that we are most significantly concerned about. For the construction of Hinkley Point, there are going to be 25,000 job opportunities. Obviously, we are doing everything we can to recruit and train UK workers to fill those roles, but because of both the scale of the workforce and to meet the niche skill requirements for the project, it is not going to be sufficient for us to use UK workers; we need to draw on EU workers. As a practical example of that, at the peak of the construction of Hinkley Point, we are going to need 1,400 steel fixers. At the moment, the total population of certified steel fixers in the UK is 2,700 so we would need more than half of the total steel-fixing population in the UK in order to meet the peak requirement for Hinkley Point. At the moment, steel fixing does not meet the criteria for skilled employment under the UK's points-based system nor is it officially classed as a shortage occupation. The same would be true of professions such as bricklayers, welders and electricians. Our primary concern is our ability to get the workers we need to build Hinkley Point C.

Dr Jenifer Baxter: I would build on the comments that Angela has made and say that there is a shortage of UK construction workers. There are some very specific skills to building nuclear power stations and other defence sites as well. This means that not only is it about upskilling the UK workforce but there is also an issue around security clearance. It has been relatively easy to have EU workers come in and have security clearance to the sites, but once we start looking further afield for people

from other parts of the world it is much harder for the security clearance to be obtained, which means that bringing people on to site and training them up could take longer. This will bring delays to our current construction.

There is also an area around manufacturing. We have had the opportunity to get parts from all over Europe. We could consider repatriation of some of our manufacturing around nuclear power stations, but this is much more of a long-term view and it is not going to help us in the short term. Having access to components that are manufactured in Europe is vital for the industry.

Dr Mina Golshan: From ONR's perspective on regulation, 98% of our staff are either British or have dual nationality. The remaining 2% are a combination of European citizens and citizens of other countries. Although we might see some of our staff leave—and unfortunately we have already seen an element of that—from a numbers perspective the impact is not significant for us. What I would say is that we want to see an industry that operates with capable and experienced staff to secure the safety of operations and the plant itself. We would want to see the industry having access to that workforce.

The Chairman: Thank you for the employment statistics for the Office for Nuclear Regulation, which are interesting, but is it not recognised that there is a pretty big skills shortage on anything nuclear in the UK given the discontinuity between the old nuclear and new nuclear? Clearly there is defence and Rolls-Royce to a certain degree, but that is about it, is it not?

Dr Mina Golshan: We have been successful in recent years in recruiting the skills that we need. There are niche shortages that we are looking to recruit in, for example, the area of control and instrumentation. There are other areas that we are recruiting in, especially the safeguards area. Because of our membership of Euratom, the UK and ONR did not have to build capability and resilience, but, given the situation that we are in now, we are working to recruit to those specialist areas, to train people and to enhance our capability so that we are able to, in effect, put in place a State System of Accountancy for and Control of Nuclear Material.

The Chairman: It will take quite a long time I should think. Lord Rooker.

Q36 **Lord Rooker:** Could I ask you about the current publicly stated positions of the Commission and the UK Government as published in their position papers? Are there any areas of substantial difference that you have spotted between the two positions and, if so, how could we reconcile these?

Angela Hepworth: The negotiations on Euratom have started between the UK Government and the EU and are following the same pattern as the broader EU negotiations in that there is a first phase of negotiation which is going on at the moment dealing with exit issues. At the moment it is focused on issues around the ownership of fissile material and

safeguards. As far as the UK Government have told us, those negotiations are constructive, but they have not yet been able to begin the negotiations with the Commission around the future of the relationship between the UK and Euratom. That has not commenced yet. We would hope that there are clear mutual interests between the UK and the EU in finding a pragmatic solution to these issues. That is what we would hope.

Lord Rooker: Do you know why they have not started? Is it dependent on the other set of negotiations or not?

Angela Hepworth: It is following the same process as the broader negotiations, but there needs to be sufficient progress in sorting out the exit arrangement before the discussion on the future arrangements commences.

The Chairman: Are there any other comments? At the moment the UK has produced a science and research paper, which affects nuclear, and a position paper on Euratom, as well as a couple of technical papers. Do you see any showstoppers? At the moment the argument is around who owns what and all that, which to anybody else seems pretty mundane. Do you see that as unresolvable or pretty straightforward?

Angela Hepworth: That is primarily a question for the Government. From what I have seen, I would hope there will not be any showstoppers and, as you say, it should be capable of being resolved pragmatically.

Dr Jenifer Baxter: The only area I would have some concerns around is the JET research facility coming to the end of its current contract in 2018. There is an element of what happens in the next part of that cycle, as it is going to be happening during the time that we leave the European Union, and what it means for research regarding how we relate to the ECJ and how that arbitration and mediation happens during that period.

The Chairman: We will come on to JET specifically later. Viscount Hanworth.

Q37 **Viscount Hanworth:** Dr Mina Golshan has already broached this issue but the question is: to what extent will the Office for Nuclear Regulation be able to fulfil the safeguarding role currently undertaken by Euratom? Will the UK need any support from the International Atomic Energy Agency—the IAEA?

Dr Mina Golshan: I started off by saying that we are building capability and capacity and we are recruiting experts in the safeguards area. However, the extent to which we can equip ourselves depends on the scope of the safeguards arrangements that the Government are working towards. That, in turn, depends on the outcome of the negotiations with both IAEA and Euratom. We are working towards having a regime in place that enables the UK to fulfil its international reporting obligations to the IAEA and to meet the reporting requirements of our Nuclear Co-operation Agreements. We see that as a much more realistic starting point that we can build upon and build in additional layers of assurance

as currently provided by Euratom. To seek to replicate Euratom standards arrangements by the end of March 2019 will be highly challenging and, while we would work towards that, we want a starting point that allows the UK to meet its obligations.

Viscount Hanworth: I have the impression that a fair proportion of the Euratom safeguarding officials, or whatever you call them, reside in the UK. Is it possible that in the absence of the ONR establishing a facility we could contract out to those people?

Dr Mina Golshan: That is a matter for the Government to negotiate with Euratom. What I would say is that a third of Euratom's workforce is undertaking safeguarding activities in the UK. As I said, our aim is to put in place a regime that allows the UK to fulfil its international reporting obligations for various areas, reporting to the IAEA and for the co-operation agreements that we put in place. We would build on that and add an additional layer of assurance to it as time moves on, but not having those layers of assurance in place does not mean that the UK will not meet its international obligations.

Viscount Hanworth: How numerous are the Euratom safeguarding people in the UK?

Dr Mina Golshan: Around 50[1].

Viscount Hanworth: And the ONR has about 560 employees?

Dr Mina Golshan: That is correct, but not all of them are working in the area of safeguards.

Viscount Hanworth: Is there a large or small proportion of those people who could be transferred into such activity?

Dr Mina Golshan: I am not able to comment on how many of the Euratom staff could be transferred to the UK.

Viscount Hanworth: I am talking about ONR people transferring.

Dr Mina Golshan: We currently have 10 staff in our safeguards function. I should not call it an inspectorate. We need another 12 to get to a level where we are able to provide the required reporting arrangements. If additional assurance layers are required we will need to staff to a higher level. Currently what we have, as I said, is based on the fact that we have been a member state of Euratom.

Viscount Hanworth: Inadvertently you have raised an intriguing issue, which is how many of the Euratom people you could poach, but you will not be drawn on that.

Dr Mina Golshan: That is not for me to comment on.

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[1] Note by witness: the Euratom effort dedicated to the UK is around 50 Full time Equivalents

The Chairman: And I suspect they would have a better career path as well.

Viscount Hanworth: I think that is it from me.

The Chairman: Can I get something clear from what you said before? From what I understand from previous evidence and from Angela Hepworth, we have a serious drop-dead date at the end of March 2019. If we do not have an IAEA-approved safeguarding authority by that moment everything stops; is that right?

Dr Mina Golshan: Unless there are transitional arrangements in place.

The Chairman: Is there a chance that your office is going to become a certified safeguarding authority recognised internationally by that time? Is that possible?

Dr Mina Golshan: There are three elements that need to be in place for us to be able to meet the roles and responsibilities that will be put upon us. The first one is to have an IT system that allows us to collect and process data and then provide a report to the IAEA. That means the UK would meet its international obligations as part of the Non-Proliferation Treaty. The second element is that we should be able to facilitate IAEA's activities in the UK. The third element is that we should have suitably experienced staff to undertake verification activities, so verifying the correctness of the data that we receive and verifying the function of equipment in place for safeguarding arrangements. At the moment we are working parallel workstreams to progress all three elements. We are in discussion with the IAEA. We have received templates from the IAEA to facilitate, effectively, proof-of-concept reporting. We are recruiting and the first element of that recruitment has been successful. We have a rolling recruitment plan in place. We are in discussion, as I said, with the IAEA to make sure they are able to undertake verification activities in the future.

The Chairman: Are you confident that you can get to the finishing line in time?

Dr Mina Golshan: There are uncertainties associated with this. The biggest risk that I see is our ability to recruit. There is another element, of course, that relies on the government negotiations with both IAEA and Euratom in respect of reporting arrangements. While we have approved a certain aspect of reporting, there remain other elements that rely on Euratom and IAEA engaging with us at technical levels.

The Chairman: Is the IAEA decision just a technical one or is it like a United Nations' decision that if someone has a grudge against us at that particular time, they can veto it? Is it like the World Trade Organization?

Dr Mina Golshan: I am not privy to the details of those discussions and arrangements. I know that safeguards is an element of those negotiations but it is not the full picture.

Viscount Hanworth: Do we have a draft of the Nuclear Safeguards Bill?

Dr Mina Golshan: We do.

Q38 **Lord Young of Norwood Green:** In terms of growing our own skills, I could not help noticing the interesting gender balance of the evidence session this morning, which is good to see, and hopefully you are the flag wavers for encouraging more young women into STEM subjects. Is that happening?

Dr Mina Golshan: As you will be aware, our Chief Executive Adriènne Kelbie is a patron of Women in Nuclear. We are working very actively to encourage women in science and engineering to take part in the nuclear industry and be attracted to the nuclear industry. We take part in various sessions that attract these young graduates. We have a number of female graduates currently working in ONR and I am sure it is a part of the industry that colleagues would be able to comment on.

Angela Hepworth: Likewise, we have lots of activities aimed specifically at getting more women into science and engineering and into the nuclear industry, both because we need to be able to draw on those skills and it is a fabulous career opportunity. We do lots of work with schools to try to get girls excited about it.

Lord Young of Norwood Green: You have answered my next question. It is really good to hear that. Are you optimistic generally?

The Chairman: I think we are going to have to move on. Although you have the gender balance right at your end and we have got it wrong at our end, we need to move on from that. Lord Selkirk.

Q39 **Lord Selkirk of Douglas:** You have already in large measure answered the question I would like to ask, but can you just outline the top priorities you would have for the upcoming Nuclear Safeguards Bill bearing in mind what you want to go into it?

Dr Mina Golshan: I think I should start by saying that the current Energy Act 2013 includes the provision for the safeguarding function for ONR. In the Bill we want to see the ability for ONR and the appropriate powers for ONR to fulfil our roles and responsibilities as a safeguards inspectorate as the UK State System of Accountancy and Control of Nuclear Material.

Lord Selkirk of Douglas: Am I right in thinking that the main problems arise out of low-grade nuclear waste and not the high grade and there is more controversy over how it should be dealt with?

Dr Mina Golshan: I am not clear about your question.

Lord Selkirk of Douglas: Those who work at nuclear power stations have to change their clothes in case they are contaminated and those clothes have to be taken and stored in concrete. There was some controversy in the past as to whether that was being done efficiently. There seemed to be much less concern over the high-grade nuclear waste

because the dangers were so much greater and much more care was taken.

Dr Mina Golshan: I am not aware of any issues around low-grade nuclear waste.

The Chairman: What needs to be in the Nuclear Safeguards Bill then?

Dr Mina Golshan: From our perspective, we would like to see appropriate powers given to the ONR to fulfil our new roles and responsibilities in safeguards regulation. As I said, the current Energy Act 2013 provides the provisions. We want the full range of powers to be able to fulfil that role.

The Chairman: That is presumably fairly straightforward?

Dr Mina Golshan: It needs amendment to primary legislation and, of course, secondary legislation to provide the details.

The Chairman: Are there any other comments? You were saying you already know what is in the Bill?

Dr Mina Golshan: We have had engagement with the Department for Business, Energy and Industrial Strategy.

Q40 **The Chairman:** That is good to hear. Perhaps we could move on to the rest of the world to a certain degree by returning to Nuclear Co-operation Agreements. Euratom has quite a large number of those. The *FT* looked at the number of international agreements that we have to transfer and it is something like 579, of which 45 were to do with nuclear, not necessarily Euratom but nuclear. Given the fact these are vital supply organisations or ongoing arrangements—and the present Government's technical paper is around ongoing arrangements—can we keep some of those? Do we have time to redo them? To me it seems a huge task to replicate these to make sure there is not a gap and the industry does not fall through the middle here. Am I wrong to feel pessimistic in this area or is it possible?

Angela Hepworth: You are absolutely right that these agreements are critical and there is a challenge for the Government in getting them in place in the timescale. Euratom has nine Nuclear Co-operation Agreements that we benefit from at the moment. Of those, the UK Government has identified four as top priority: the US, Canada, Japan and Australia. We would agree that those are the priority countries.

There are two issues around the timing. One is the interaction with the safeguards regime. Each of those countries will need to be assured that the UK will have a safeguards regime in place and approved by the IAEA, so there is an interaction in the timescales for sorting out safeguards and being able to negotiate the Nuclear Co-operation Agreements.

The other issue is that each of those countries will have its own ratification process. For example, if we look at the United States—and as

I have said, that is a critical day-one agreement because it is illegal to export components without having an agreement in place—the Nuclear Co-operation Agreement will have to be signed by the President. It will have to be laid before the House Committee on Foreign Affairs in the Senate and it will have to be laid before Congress. Each of those steps has a process and timescale associated with it. The challenge for the UK Government is managing the interaction with safeguards, conducting those negotiations and then steering those agreements through the ratification processes of each of those countries.

Dr Jenifer Baxter: I think it is important to add that the UK and Euratom do not require an NCA to actually trade with each other. Potentially there is the opportunity to continue with Euratom after we leave the EU without an NCA, but it gives us an opportunity to establish exactly how we are going to work with them in the future. There is that element to it. There is also the fact that NCAs tend to fall into two different groups. You have an NCA for nuclear safety, which is where we tend to co-operate with countries in supporting the development of their nuclear safety, so that is us exporting our skills and knowledge and helping other countries to have peaceful, civil nuclear programmes. The ones that are more complex, which tend to include things such as trading in nuclear materials and the ones that Angela has talked about—peaceful uses and nuclear energy—have more components, which means there is a need for more negotiation. However, we have templates for them, so the ability to adjust that for the needs of the UK's new position is easier in some respects because they are documents that we can access and use and the United States, Japan and Canada will understand where we are coming from with them.

The Chairman: How dependent on us are the counterparties? Is this an area where we have leverage for once? If these agreements fall apart does the other party have severe difficulties as well, or does that not count?

Dr Jenifer Baxter: To a certain degree it depends on what the negotiation is about. We have world-leading expertise particularly on decommissioning and safety areas. We have a gold standard from ONR about how safety is conducted, and I am sure that the safeguards regime will follow the same route. In that respect, there is an ability for us to say, "We have these skills and this knowledge that we can support you with". Equally, it is entirely dependent on how their systems work and how they ratify them, and that is going to hold us up on the more complex agreements.

The Chairman: So we do not have a lot of leverage in this area?

Dr Jenifer Baxter: No.

The Chairman: I was looking for some brightness there. That is a shame. Earl of Stair.

Q41 **The Earl of Stair:** We are currently importing quite a lot of nuclear

waste for reprocessing from Europe. However, I believe the Government's policy at the moment is that the residues of that nuclear waste remain the responsibility of the country that has actually generated it. What are the implications of us withdrawing from Euratom for the ownership and management of nuclear waste in the UK and the EU in the future?

Dr Mina Golshan: That is part of the broader negotiation that the Government need to have with Euratom and those states. I am aware that the NDA is working very closely with BEIS on that particular issue to take it forward in an amicable way.

The Earl of Stair: So it is part of the broader picture and hopefully will be followed through.

Dr Mina Golshan: Yes.

The Chairman: We will move on to investment and funding and no doubt we will come back to Hinkley Point C. Lord Selkirk.

Lord Selkirk of Douglas: Will investments in nuclear power plant by other countries both within and beyond the EU still be viable after the UK withdraws from Euratom? There is an extension to that question: what could be the implications for Hinkley Point C or the proposed developments in Anglesey and Cumbria?

Angela Hepworth: I cannot speak for other developers, but I can give you EDF Energy's perspective. One thing that absolutely has not changed as a result of the decision to leave Euratom is the need for new nuclear power stations. In an environment where our existing power stations are closing and there is a need for new, more decarbonised power, the need for new nuclear power stations is as strong as ever. Our commitment to building Hinkley Point and the follow-on stations, including Sizewell, remains as strong as ever.

As I have already mentioned, the decision to leave Euratom presents practical challenges for the delivery of those projects that need to be addressed. The key challenges are around having access to the workers to build the power stations. That is something we have talked about already. It is also the implications for the supply chain and getting the material in that we need to build the power stations.

Taking Hinkley Point as an example, two-thirds of the value of the construction of the project will be going to UK businesses. We have put a lot of effort into getting UK businesses into the supply chain, but that leaves a third of the construction value which will be going outside the UK and means that we are dependent on countries in the EU or further afield. Again, to bring it back to practical examples, components for the fuel-handling system are due to come from the US and components for the nuclear steam supply system are due to come from Japan. We need the ability to move these components into the country in a timely way in order to be able to deliver the project.

The Chairman: Could we move on to the area of research funding? Baroness Sheehan.

Q42 **Baroness Sheehan:** How far does UK participation in Euratom enable access to nuclear research funding? What impact will withdrawal have on this funding? In addition, if we can move on to JET, what are the likely implications for the funding of the Joint European Torus programme and the UK's participation in the International Thermonuclear Experimental Reactor programme?

Dr Jenifer Baxter: I will have a go at answering this. I have spoken to our membership about this to make sure that I have the right details for you. I am sure many of you are aware that nuclear research is a global thing, not just a European thing, and that is for fusion and fission. We have amazing expertise in the UK. We attract people from all over the world to our universities and research facilities. We need to make sure that not only do we not lose those but we do not lose the people who come in and support that work. As part of Euratom, we share research funding, research findings, facilities and researchers. This happens at the JET facility in Culham and we also have EUROfusion, which is a large fusion tokamak. Euratom has just awarded £20 million for enhancements to that tokamak. That is a significant amount of European funding.

The JET programme period comes to an end in 2018 and for the security of the workforce and the research itself, and to make sure that it continues on to their successor, which is the ITER project that is being built in France, we need to ensure that there is some kind of arrangement. Ending in 2018 is a problem, because it is mid-negotiation, and I am sure that they would want clarity from the Government on what is going to happen next. Funding has been promised, but there is more to it than just funding; there needs to be shared research collaboration with the rest of the European group.

We share around 45% of the construction costs for the ITER project. I think each third state pays around 9% into the ITER programme and if we leave there is a possibility that the costs we pay will increase because we will have to re-join the programme another way. Some kind of association with Euratom enables that to be reduced. It is also important to say that recently JET has received around €60 million—and that is per year—to run the machine and researchers there. There are 50-plus PhD students who are working on these projects in the UK, so it is quite a substantial amount of European funding and quite a substantial number of people who are learning and working at these facilities. There is a real need to ensure that as part of negotiations some form of relationship is maintained, and what that looks like can be bespoke and we can ensure that it means that the UK continues to lead. I think that is very important if we want to encourage growth in skills. People have to see that there is expertise here and there is a career path that they can follow.

Viscount Hanworth: Are we to understand that the research programme on JET is coming to a natural conclusion or is that a misapprehension?

Dr Jenifer Baxter: As far as I understand, there is more to do until 2020 so they need an extension of the contract to finish the experiments that they are currently doing. They have to ensure that people stay to finish those experiments. The successor is the ITER project.

Viscount Hanworth: Will the Culham facility be closed down?

Dr Jenifer Baxter: I do not know whether it will be closed or used for something else. I do not have that information.

Lord Rooker: It is not supplemental to this question; I want to go back to an earlier issue that was raised.

The Chairman: Lord Selkirk, did you wish to follow this?

Lord Selkirk of Douglas: No, it is a slightly different point.

Lord Rooker: Mine is a completely different point. I want to go back to what you said to us, Angela, in answering the question about what I might call construction workers. You gave us some very precise figures of steel fixers or steel erecters, what was required and how many were in the country. How do you know about those precise figures?

Angela Hepworth: We have detailed workforce plans looking at the workforce that is going to be required for the project. We have been developing that through our engagement with our supply-chain partners. As I said, we are not going to be employing a lot of these people directly ourselves, but they will be people who will be required through our supply-chain contractors. We have been engaging with them to understand their requirements for skills on the project.

Lord Rooker: Are they registered in any way in terms of qualifications? You cannot have a scaffolder nipping up to do steel erecting; it is a completely different occupation, which is what you were talking about.

Angela Hepworth: Many of the roles involved in construction will have very specific skills and training requirements.

Lord Rooker: Given what you have said that your requirements at Hinkley Point would occupy half of the people available in the country to do this work and they are not covered by any Home Office rules, could you do us a brief note on that?

Angela Hepworth: Yes, I am very happy to, and on the broader issues within the workforce.

Q43 **Lord Selkirk of Douglas:** Is decommissioning not an enormous and continuing challenge? Will the Nuclear Safeguards Bill cover that subject fully?

Dr Mina Golshan: We already have powers in the regulation of decommissioning in terms of safety and security. The Nuclear Safeguards Bill will give us equivalent powers to regulate safeguard activities.

The Chairman: I want to spend a few minutes, because I think it is crucial, on transition or interim arrangements. I suppose the first question is whether an interim position is actually possible and, if it is, what it should be. Should we be an associate member of Euratom? If we do not get safeguarding—and I am not saying we will not—over the line, can we still use the Euratom umbrella without having to get 27 Member States and the European Parliament to agree it? Is there a credible transitional or interim arrangement until we have all the bits of our jigsaw we need in place?

Dr Mina Golshan: First, what the transitional arrangements look like is very much for the Government to negotiate, but I am not aware of any European Member State that has associate membership of Euratom. That does not exist currently and if there are arrangements to be negotiated, that is very much for the Government. We have countries such as Switzerland that have observer status as part of the European Nuclear Safety Regulators Group. That is a creature of the Commission and by means of that they contribute to the activities of ENSREG—the European nuclear safety regulator—but I am not aware of any other arrangement in place.

The Chairman: Presumably they do not provide Switzerland with a safeguarding role?

Dr Mina Golshan: No, they have their own safeguarding.

Angela Hepworth: We have the same understanding. There are two countries that have special arrangements—Switzerland and the Ukraine—but they are focused primarily on R&D activities. If the UK was able to come up with arrangements to continue its engagement with R&D, that would be very beneficial, but that does not address the key things we are concerned about around our ability to move fuel, components, information and personnel.

The Chairman: Angela Hepworth, if you were the Secretary of State for Brexit or BEIS, or whoever is in charge of this area, what solution would you try to negotiate if this interim period were needed? What might its shape be? What would you try?

Angela Hepworth: I have to say from our perspective we are more focused on the practical dimension of the arrangements that need to be put in place.

The Chairman: That is fair enough; I accept that answer.

Dr Jenifer Baxter: When you look at the associations that exist, they are bespoke: they have all been agreed independently, they tend to have a timeframe and they may be renewable. There is a possibility that you could look at association for very specific areas if you needed that. How that would work for safeguards, I am not sure. Primarily, it may mean that you need to look at different exit dates, which is basically allowing

time to get everything in place. That is a different exit for Euratom versus for the European Union treaty which makes it very challenging.

The Chairman: I think that date is already fixed.

Dr Jenifer Baxter: Further than that, I do not think there are any members of the remaining EU 27 who want the UK to leave without UK safeguards in place. With the challenges to the nuclear sector—it is a global supply chain with global research—they all want to work together.

The Chairman: That is an important point. Lord Rooker.

Lord Rooker: I did not want to set a hare running when I asked this question originally, but I have understood as a complete outsider on this—I am the oldest chartered engineer you will ever come across by the way and most out of date—that the sticking point about Euratom is the ECJ. In other words, you could completely separate it out, but the Prime Minister and the Government were adamant the ECJ were not having it. For these other countries that have arrangements—the Ukraine and Switzerland—there must be an ECJ component to that; is that correct?

Dr Jenifer Baxter: Yes, they agree with the European Union and they follow the ECJ, but there are other options happening across the European Union and different elements of that that have different arbitration approaches. There are different ways it can be done; it depends on which aspect you are looking at.

Lord Rooker: Is the Ukraine involvement because of Chernobyl?

Dr Jenifer Baxter: I do not know why they made the decision.

Lord Rooker: Could we have a 10-year transition out of Euratom provided we were prepared to put up with the ECJ quite separate to the other EU treaties, which is what I asked originally? You seemed to be saying, Jenifer, that they could be separate end dates.

Dr Jenifer Baxter: For the whole of it I am not 100% sure. There are a much wider number of directives—for example, the Radioactive Waste and Spent Fuel Directive—that will likely get rolled over with many of the directives from the European Union, and what happens after we leave nobody knows. They would probably be treated in bulk along with those other areas.

The very specific areas that we have talked about today on safeguards, NCAs, research and trade, tend to be considered slightly separately. There is a much broader element to Euratom that will need to be part of the so-called Repeal Bill.

The Chairman: Thank you very much indeed, Angela Hepworth, Dr Golshan and Dr Baxter. It has been a very, very interesting and perceptive session. The House and our sister Committee, the Science and Technology Committee, have taken a great interest over time in this area as well. Thank you very much indeed. I bring this session to a halt.