

Select Committee on the European Union

Energy and Environment Sub-Committee

Corrected oral evidence Brexit: energy security

Wednesday 6 September 2017

10.35 am

Watch the meeting

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

Evidence Session No. 1

Heard in Public

Questions 1 - 20

Witnesses

[I](#): Joseph Dutton, Policy Adviser, E3G; Georgina Wright, Research Assistant and Co-ordinator, Europe Programme, Chatham House; Malcolm Keay, Senior Research Fellow, Oxford Institute for Energy Studies.

[II](#): Lawrence Slade, Chief Executive, Energy UK; Phil Sheppard, Director of UK Systems Operation, National Grid; Ian Graves, Director of European Business Development, National Grid.

Examination of witnesses

Joseph Dutton, Georgina Wright and Malcolm Keay.

Q1 The Chairman: Welcome to the first of our evidence sessions on the last of our short Brexit studies, on energy security. Can I go through some housekeeping issues? First, I remind you that this meeting is being webcast, so it is being recorded and is public. We will be taking a transcript. That transcript will be sent to you, so if anything has been transcribed incorrectly, you will be able to correct it. I remind Committee Members that, if they have any interests that they need to declare, they should do so when they first speak or ask a question. I myself am a trustee of an organisation called Regen SW and of the Green Purposes Company, both of which may be relevant to today's sessions.

I ask members of the panel briefly to introduce themselves, not just for us but for those listening.

Malcolm Keay: I am currently with the Oxford Institute for Energy Studies, where I look mainly at electricity and energy policy interactions. I have worked previously in various parts of the energy sector.

Georgina Wright: I am a research assistant at Chatham House, on the Europe programme. Chatham House is an independent policy institute based in London. The views expressed during this session are mine alone.

Joseph Dutton: I am a policy adviser for E3G, which is an environment, climate change and energy think tank. I have a varied background in energy, but I look predominantly at UK and EU energy policies.

Q2 The Chairman: Thank you very much. Today, we are trying to get a broad spectrum of the principal issues we will have as regards Brexit and energy security. In your view, what are the implications of the UK's withdrawal from the European Union for the UK's energy security? What advantages might there be, as well as issues that we will have to solve and fix? What would be the impact on energy supplies of failing to reach a new deal with the EU before Brexit takes effect? If a transitional arrangement is required, what would we like to see and what should be there? That is a very broad canvas to start off with. Who would like to lead on it?

Malcolm Keay: I am happy to start. There is quite a clear distinction between electricity and gas in this respect. For gas, as you know, at the moment we are dependent on imports for about 50% of our demand. The European Union has arrangements for a gas emergency. Until we know what the outcome is, we will not know whether we are likely to be able to participate in those, but it is quite likely that we will not. On security, therefore, there is an immediate possible threat.

With electricity, that is less so. We trade only about 5% of our electricity. There are some challenges with electricity, but those are as much to do with the increasing penetration of intermittent renewables, which will have to be encountered in any event. It is not a direct result of being

inside or outside the European Union; it is going to happen anyway. Being outside the European Union might make it marginally more difficult to address those challenges, because we would have less free trade with Europe. However, countries outside the Union, such as Switzerland, trade with it fairly extensively, so I think it is a fairly marginal difference.

One of the benefits is that it will concentrate minds. There is a slight risk that, when you are within the European Union, you think that all the problems can be solved by trade. Look at the example of Germany just now, with its very large amounts of wind power. When it has a surplus, basically it just dumps it on all the other countries in Europe. It creates problems for others. One advantage of being on our own, so to speak, is that we will have to concentrate a bit harder than we might otherwise have had to do, and that might be beneficial.

Georgina Wright: I agree with that. Of course, energy trade between the UK and the EU 27, and the UK and third countries, would continue even in the event of no agreement. The key risk is around how efficient that trade would be. That is particularly relevant for electricity. It is about the efficient use of interconnectors and, of course, the UK market being coupled to the EU market.

There is a more significant risk for the UK's nuclear industry, because there is no WTO agreement to fall back on. If the UK were to leave the EU without an agreement, a new non-proliferation regime and new agreements with nuclear fuel suppliers, it would bring the UK's civil nuclear industry to a halt, because it would not be able to import fresh nuclear fuel.

Joseph Dutton: I agree with what the other speakers have said. The thing that stands out for me is that the UK is taking a step back from a market that we, essentially, designed. For decades, we have pushed within the European Commission, and led on our own, things to do with market liberalisation and market harmonisation, to ensure that there is a functioning marketplace that delivers security of supply, investment security and the correct price signals for the UK energy sector. We are now stepping away from that, at a time when it is really gathering pace and is delivering benefits for the UK. That seems quite an odd thing to do. It is already having an effect on the price signals for the UK. For example, the changing exchange rates have certainly had an effect on the cost of importing gas and electricity.

I imagine that most of the focus will be on electricity, but the closure of the Rough storage facility in the summer has certainly changed the game for the UK on natural gas. Previously, we had the most liquid market in north-west Europe. That has changed in the last couple of years. As our storage facility has closed, we will become more dependent on the EU for gas supplies. It is not clear how that will actually happen if we are stepping away from a marketplace with the same regulatory regime, which easily allows for trade between us and the EU.

The Chairman: Good. We are as interested in gas as we are in electricity

or anything else, although as regards nuclear we will look at Euratom and those issues in a separate session next week, so please address the whole range.

Can I come back to you, Mr Keay? You mentioned Switzerland. I cannot remember whether Switzerland is absolutely part of the internal energy market, but it is an example of a country that has very strong connections, but a number of issues. We are being told that the Switzerland issue will not be duplicated for us, but are there things that we can learn from it?

Malcolm Keay: We can learn from it that it is quite difficult to do a special deal. Switzerland trades extensively with Europe. That has been going on for decades, even before the European Union was set up. It is not part of the internal energy market. Part of the reason for that goes back, funnily enough, to issues rather similar to those in the UK. You may remember that a few years ago Switzerland had a referendum about immigration. That halted negotiations about membership of the European energy market, so it is not formally part of the market. You do not have to be formally part of the market to trade, but, as Georgina said, it is obviously more efficient and more flexible if you are part of the market.

I do not know whether you want to get into all the technical details, but the way the market works is through the elaboration of codes—getting new network codes and so on. Switzerland is not part of that; it cannot be, because it is not part of the market. Therefore, as we go forward and the European internal market develops, gets more complicated and gets more of these codes and so on all over the place, it will be even more difficult to trade, relatively speaking. If someone is trading, it will be much easier for them to trade with someone who is within the internal market than with someone outside the internal market. It does not mean that it will not happen, but there will be more friction in the bearings, so to speak.

Meanwhile, for at least seven years—I do not know exactly how long—Switzerland has been negotiating a special arrangement with the European Union on energy trade. Initially, that was suspended because of the immigration issue, but it has taken a long time. It just shows that it will not be that easy to do your own special deal. That is the main lesson. You can still trade, but you will lose some fluidity and flexibility, and being part of a frictionless market.

Georgina Wright: I agree with Malcolm. It is interesting that in August, after negotiations with its Swiss counterparts, the European Council put forward a decision on how it could move forward with market coupling for electricity. Some of the key points in that decision mentioned the creation of a new joint committee, which would allow for arbitration and, possibly, a dispute settlement mechanism. Another point was the dynamic incorporation of legislation, which would mean that there was no need to reopen negotiations every time there was divergence; rather, there would be an ongoing discussion. It was also about harmonisation and how the EU and Switzerland can make sure that their standards meet and are

similar—including on aviation, which was very interesting. If Switzerland felt that those standards were overreaching, the joint committee could put forward a recommendation. Finally, there was the idea of having a more regular dialogue, to allow for more influence over decisions and discussions on ongoing EU energy policy developments.

Q3 Lord Curry of Kirkharle: My question follows directly from that conversation. The difference between ourselves and Switzerland is that we are currently part of the internal market. Do you think it is possible for us to negotiate to stay in it, even though we have left the European Union?

Malcolm Keay: Personally, I think it will be very difficult. Staying within does not just mean staying where we are. It means accepting all the future codes that I mentioned, which are effectively legal documents that are elaborated within Europe, and it means accepting European court jurisdiction of those codes. It could be dependent on wider issues. I mentioned that immigration was the sand in the works as far as Switzerland was concerned. It is difficult to think that the UK could accept all of that, given that its negotiating position is basically to have its own special deal, as I understand it, rather than to join something ready-made and accept the jurisdiction of the European court. I would not rule it out—if the will is there, I am sure it could be done—but I fear that it will not be at the top of anyone’s negotiating agenda and it is likely to get lost in the wash from a lot of other issues. I am afraid that, personally, I would not be optimistic. The other witnesses may be more optimistic.

Joseph Dutton: There are mechanisms for third-party countries to take part in the procedures for developing network codes et cetera. ACER—the Agency for the Cooperation of Energy Regulators—has a system whereby third-party countries outside the EU, or countries in the process of joining the EU, can participate. However, as the other witnesses have mentioned, a requirement of that is adhering to EU legislation, where there is dynamic incorporation and enforcement, and that comes down to the ECJ which, as we know, is a red line for the UK.

We have looked at Switzerland. If we look at Norway, the view within the energy industry is that being part of the EEA works as a political compromise domestically but is not good for Norway’s energy sector. Being on the outside and trying to negotiate in when you do not have a formal role means that, essentially, you have to start with what the EU wants. Your interests come second, because you are the smaller party, negotiating inwards. That is coming from Norway, which is an incredibly large supplier of gas, oil and, increasingly, electricity to the EU. It is in a much stronger position, in that sense, than the UK, but it struggles to negotiate its way in. It also has to negotiate new directives with Iceland and Liechtenstein, by virtue of its membership of the EEA. It cannot work simply as an individual; it has to work with the other members of the EEA on those directives.

Georgina Wright: There is also the question of whether the UK will want to remain a member of the internal energy market. In the short to

medium term, particularly for the efficiency of trade in electricity, it would perhaps be in the UK's interest to remain a member of the internal energy market, but a lot will depend on the future agreements between the UK and the EU 27 and on non-energy specific decisions, which Malcolm mentioned—things such as freedom of movement, access to skilled workers, non-tariff barriers and other related issues.

In the longer term, it will depend on the UK's industrial strategy post Brexit. Will it see membership of the internal energy market as in its interest? The energy sector is going through a period of change, so we will have to see the impact of the increased use of renewables in the system and the electrification of transport and heating. There is the issue of whether the UK wants to, and then of whether the UK can, which comes down to the mechanisms—the institutional set-up. Is there an arbitration body? Do we conform to EU standards? It also depends on political will on both sides. That will be affected by the tone of negotiations and by trust. Finally, there is institutional capacity. That may require the UK to increase its presence in Brussels and member states, with twin-track diplomacy—businesses operating in the EU increasing their presence as well.

Q4 Lord Krebs: You have partly answered my question, which was about the extent to which we would have to comply with current and future EU legislation and the jurisdiction of the European Court of Justice if we remained in the internal energy market. You have just confirmed that that is what you all feel. Perhaps you could respond to that. Would it be restricted to energy legislation, or would it extend to other sectors as well?

Since you have already answered that in part, I will add a supplementary. Georgina, you are the co-author of a report by the University of Exeter and the UK Energy Research Centre. In it, you talk about the implications of the internal energy market for consumer energy prices. Do you think that leaving the IEM will lead to greater variability or an increase in prices for consumers? Could you deal first with compliance and then with my supplementary question about prices?

Georgina Wright: On compliance—whether the UK would have to meet EU standards and accept ECJ jurisdiction to remain a member of the internal energy market—it is about adhering to a common standards. The EU has made clear in its negotiating principles that, in a future free trade agreement between the UK and EU, there would be “a level playing field in terms of competition and state aid” and that it “must encompass safeguards against unfair competitive advantages”. That assumes that standards would go beyond strictly energy and environment and could incorporate other standards, such as those on market and competition.

The cases of Switzerland and the EEA show that it is not strictly about accepting ECJ jurisdiction but about having an arbitration body the EU and the UK feel comfortable with. The Government's paper on enforcement gives some food for thought in that regard.

On prices, again it goes back to the efficiency of the electricity trade. Currently, the UK Government's plans for decarbonising the UK's power sector envisage trebling interconnection to continental Europe. The UK could look to reduce interconnection with continental Europe, but a reduction in interconnection capacities and the scope of their operating regimes could have a negative economic impact on consumers, with higher prices forecast in the short to medium term. If we are going to move away from interconnection, it will need to be managed carefully to ensure that there is not a spike, and uncertainty around that and associated risks.

Malcolm Keay: Can I add a point that is relevant to both questions, so that we do not forget it? It concerns the position of Ireland. Although I think it is unlikely that we can negotiate for the UK to be a member of the internal energy market, Ireland, as you probably know, is moving towards a single energy market. It makes an awful lot of sense for that to happen in the island of Ireland. Therefore, it seems to me at least possible that a special case would be made for Northern Ireland—that, effectively, it could remain part of the EU as far as electricity is concerned. As you probably know, there are particular price issues in Northern Ireland, where prices to consumers have historically been higher than in the rest of the UK because it was a very small market and could not get the same efficiencies.

The Chairman: We will deal with Ireland specifically next week.

Malcolm Keay: There is an energy aspect to it.

The Chairman: We would be delighted to take your further written evidence on Ireland.

Malcolm Keay: Okay. I will leave it there.

The Chairman: We would find that very useful, but we will not go into it in detail in this session.

Viscount Hanworth: You are suggesting that the SEM might provide a template for UK-EU connections.

Malcolm Keay: Not exactly. I am suggesting that a special case might be made for Northern Ireland because it makes so much sense, even if my general view is that the UK is unlikely to stay inside the internal energy market. The arguments in relation to Northern Ireland are slightly different.

Joseph Dutton: On the interconnector issue, there has been a lot in the news this year about consumer bills going up. At the moment, around 40% of consumer bills is made up of the wholesale price. Domestic bills are susceptible to movements in how much it costs to produce and to import electricity. As Georgina mentioned, the Government have a plan to triple our interconnection capacity to the rest of the EU. As well as that being about physical supply of electricity, it allows us to develop more electricity production from renewable resources. Interconnectors allow

you to balance your system with other countries. Across the two, you have a lowering of the wholesale cost of electricity. Previous work by the Government estimated that, for every gigawatt of capacity you add in interconnectors, you lower wholesale prices by up to 2%. If we are no longer building those interconnectors, there will be a loss of financial benefits to the UK and the wholesale market.

With respect to your future session on Ireland, there is one aspect of the special case for Ireland that is worth bearing in mind. Although being part of the SEM between the Republic and Northern Ireland has lowered costs by about 10%, a special case for Northern Ireland would require Westminster to devolve legal powers over energy, which are not currently devolved, to Northern Ireland. Although we are looking at a European aspect and whether there could be some sort of accommodation there, it has quite broad constitutional consequences for the UK.

The Chairman: It also helps to have a Northern Ireland Government to be able to do that.

Joseph Dutton: Yes.

The Chairman: We are still working on that one.

Can I follow up on Lord Krebs's question? Never mind our being able to negotiate common standards, will we, as in some other industries, perhaps, become just a rule-taker? With the codes, for instance, will we just have to do that anyway, because to have efficient trade in electricity we will need to comply with the standards that evolve on the other side of the channel?

Malcolm Keay: I do not think that we will have to. Countries such as Russia, for instance, export power to the European Union, but they do not necessarily have to take on the same obligations. Indeed, I would argue that there might be a case for the UK having more flexibility, because the market structures that suit you are very much dependent on the composition of your generating fleet, the geography and so on.

The Chairman: One of the benefits could be that we do not have to do it.

Malcolm Keay: It could be in a better position, if it has the flexibility. We have already seen that. As you know, the UK introduced a capacity mechanism that Europe did not like very much, but it felt that it had to do it in special circumstances. Those sorts of situations are likely to increase in future. Because of the UK's climate strategy and the growth of intermittent renewable power, it may well want to consider market reforms of a more fundamental sort. That would probably be easier outside Europe, because getting 28 countries to agree on a fundamental change to a system that they have already set up would be extremely difficult. In that sense, it is not necessarily a bad thing if we go our own way, because it will enable us to deal with our own issues.

Although we talk about a single energy market, there is not one, really—partly at the technical level, but, more importantly, at the level of things such as support for renewables, which is different in every country, is undertaken in a different way and leads to different market outcomes. In some ways, the market is a bit of a mix of two separate things: national energy policy—as you know, energy policy is national under the treaties—plus a market. That already creates quite a lot of strain between the international market and national energy policies.

The Chairman: We move on to the Earl of Stair. We seem to be getting one question ahead of each other as we go through, but let us see how we do.

Q5 **Earl of Stair:** As we progress through the whole Brexit process, our relationship with the internal energy market may deteriorate and become even more inefficient than it is at the moment. If the UK were ultimately to leave the internal energy market, what would the implications be for our energy security, domestic generation and consumer costs? Georgina, you have already covered consumer costs to a certain degree, but I would like to hear a bit more from the other two on that.

Joseph Dutton: Obviously, it is quite unknown. There are some serious discussions going on within the energy industry about what will happen, because it does not know what is going to happen beyond 2019. Potentially, you could see a real configuration of how the UK generates electricity, for example. If we are able to develop our future electricity generation sector away from renewables targets from the EU, that is a possibility. If we came out of things such as the Industrial Emissions Directive, coal could stay on the system longer and we could have more gas. At the same time, the UK has its own legally binding carbon targets by 2050, under the Climate Change Act. I know that some people are rubbing their hands with glee at the prospect of renewables being pushed out, as they view them as something that is EU driven, nothing to do with the UK and foisted upon us. That is not actually the case. It could go either way.

One thing that is quite important, particularly if we are becoming less connected to the EU, is the issue of gas supply for the UK. We have become quite complacent, because we have had so much gas production from the North Sea that until the last decade we were able to be a net exporter. The problem is that as we become more disconnected—whether physically or as regards the friction of trade across gas interconnectors—there could be a situation where the Government have to incentivise the construction of more gas storage facilities. The Government looked at that in 2013 and decided that it was not needed because the market was delivering the right signals. Those signals will not be around if we come out of the IEM, because we will not be trading within that fluid marketplace and our access to gas from the EU may be reduced. We could therefore see a return to that. If we see more gas storage built, we could see other incentives for gas plants to remain on the system, particularly if our future interconnections to Europe for electricity are not being built. That is an issue for electricity supply. We could have a legacy

of assets remaining on the system that previously would have been taken off because of decarbonisation targets.

Earl of Stair: Can I follow up on that? Malcolm, earlier you made some very interesting points about Germany's wind generation and the fact that, effectively, it just dumps on to the interconnector system. In the event that our internal energy market has collapsed, what implications do you see for renewables in the form of solar and wind in the United Kingdom when suddenly we have the huge surges that, you suggest, Germany is experiencing at the moment? How will that affect the power supply?

Malcolm Keay: As I said in my introductory comments, in a way it is helpful, because it forces us to concentrate our minds. The island of Ireland, for instance, has a higher proportion of wind power—a proportion that a few years ago National Grid said it could not cope with here—and it encounters certain difficulties, but it copes with it. Once you start to focus on what you can do yourself with regard to the design of the system, the sort of market that you have and the sorts of ways in which you reward people, provide flexibility and so on, increasingly it seems apparent that there are solutions to many of these problems. The difficulty in some cases—as in Germany's case—is that when you have the simple solution, which is just to export it, you do not concentrate on those things.

As was said, the driver for this is UK climate policy. The Government are due to come out with a new clean growth White Paper later this year. There is no suggestion that they will withdraw from that. Meanwhile, some previous front runners, such as carbon capture and storage and nuclear, are looking as though pretty far down the line they will not meet some of the earlier promises. Almost inevitably, we will have to meet those challenges. In a way, it is good if we concentrate our minds on them, because we know we have no alternative but to do that.

Earl of Stair: It seems that we may end up with much more extreme overproduction and underproduction unless we can develop some method of storage.

The Chairman: I do not want to go too far down the road of UK energy strategy in this session.

Baroness Sheehan: Could I ask about the implications for Scotland, or is that outside the remit for today? I know that we have covered Ireland—the island of Ireland—very briefly. Could you address the issues and implications for Scotland if we were to leave the IEM? What friction might it cause with Scotland's aims for 100% renewable energy generation?

Malcolm Keay: In one odd sense, Scotland is probably in the same position as Ireland. It would quite like to continue to trade freely with the rest of Europe, partly because of its renewable ambitions. Again, there are internal issues in the UK. If Scotland becomes 100% renewable, the sorts of issues we have just talked about become even sharper in the

sense of Scotland itself because, as you know, there is congestion on the interconnection between Scotland and the rest of the UK. It would require quite a lot more interconnection capacity to be built. Although there are various proposals for that, it is not entirely clear how it will take place.

I am pretty sure that it would have been easier from a Scottish point of view to have stayed within the internal energy market, but I do not think that is a political possibility for Scotland, because it does not have a border with the EU; it just has a border with England. That is the issue that will have to be resolved—the border with England. Meanwhile, it is in a German situation; it wants to build a lot of renewables and close its nuclear, so it will face the problems that Germany has had. I imagine that it will want to solve them in the same way as Germany has—by exporting to the rest of the UK—so it will create some issues within the UK, but those are not really European issues as such.

The Chairman: There is quite a lot about Scotland in the paper Lord Krebs referred to. If you wanted to provide us with further written evidence on Scotland, we would be very happy to receive it.

Joseph Dutton: I wrote the box on Scotland in the paper. As Malcolm said, the problems facing Scotland are quite similar to those facing Ireland. Again, it comes down to issues around interconnection. In theory, Scotland would be the landing site for two future interconnectors, one from Iceland and one from Norway. The operation and future regulation of the one from Norway depends on the final settlement that the UK has with the EU, because of how the interconnectors are regulated, so obviously that has an effect.

In the shorter to medium term, although we are looking to decarbonise, there are consequences for oil and gas in Scotland. There are hundreds of thousands of jobs in Scotland as a result of the sector. Oil & Gas UK, which is the industry organisation, has estimated that trade in the products that the oil and gas sector in the UK produces that would have tariffs on them under WTO rules would double, to more than £1 billion, compared with what it is currently. That has a knock-on effect on the wider operation of companies operating in the North Sea, and particularly how Scotland deals with that. The intergovernmental agreements that the UK has with Norway on oil and gas are underpinned by EU competition law on access to infrastructure and how it is administered. Obviously, that is more pressing for Scotland than it would be for the rest of the UK, because of the economic impact and the impact on jobs in the region, compared with the UK as a whole.

Georgina Wright: The key question is not only whether the UK will remain a member of the internal energy market but whether the UK will remain a member of the EU's market coupling mechanism. Can the UK market remain coupled to the EU's? As Joe mentioned, that will depend on harmonising standards, not only on energy and environment, but perhaps on competition and state aid. There is also the impact of other rules that will be negotiated, presumably, between the UK and the EU for their free trade agreement. It is not only about the internal energy

market; as long as the UK continues to trade energy with the EU, it will access the internal energy market. It is about being part, at least in the short to medium term, of the EU's market coupling mechanism, which would allow more efficient trade of renewables.

The Chairman: That is a very important point. The key issue is the coupling arrangements. Can you just stay part of that? Do you require a 500-page treaty agreement that takes seven years, or does it just carry on?

Georgina Wright: It is one of the key issues. The case of Switzerland shows that, even being at the heart of Europe, it is very difficult to become part of the EU's market coupling mechanism and that it is not a decision that can be isolated, or that is even a sector-by-sector decision. It will be affected by whether there is an arbitration body that is acceptable to both sides, whether there are common standards, how we ensure that those are continually updated to allow no disruption to trade, and other issues. As the case of Switzerland has shown, sometimes decisions taken on restricting EU worker quotas can have an impact on discussions in other areas.

Malcolm Keay: At present, market coupling is on what is called a day-ahead basis. The EU wants to change it to include intraday market coupling. That is the bit that will be really important. It is a future development that has not taken place yet and will be more difficult if we are outside the EU. I think the position still is that Switzerland is not participating in that because of its lack of an overall deal with the EU. That is one example of it, and the one that will be particularly important for renewables, because the intermittency tends to take place on a daily basis, in the rather short term. That is where the short-term trade matters.

Lord Young of Norwood Green: You talked about responding to the challenge, and focusing our mind on periods of oversupply from renewables. Does battery technology come into this equation? Will it make a contribution in the timescales?

Malcolm Keay: It does, but it is still very expensive. I can give an example. The average battery costs about £200 per kilowatt hour to build now. The goal of the vehicle battery makers is to get it down to £100 a kilowatt hour. By comparison, it costs about 30 cents a kilowatt hour to build storage for natural gas. Another comparison is that we have about two hours of electricity storage in total in the UK—all our electricity storage. We said that we have little gas storage now, but it is still a few weeks' worth, coming down, when Rough closes, to perhaps one week's worth.

Battery technology is very expensive. At the moment, it is useful for mobile applications and for very short-term response—what is called frequency response. For storing large amounts of electricity, it is not yet really economic. It might be in future. The problem with wind power is that the wind can stop blowing for a week at a time, or even two weeks

at a time, so you have to have quite long-term storage, not just short-term storage. It could change—anything could happen—but at the moment it is not there.

The Chairman: We will leave it at that point. Can I ask for short interventions?

Viscount Hanworth: Has the potential for pump storage now been exhausted, or are there still possibilities?

Malcolm Keay: That is part of the storage I mentioned—two hours for the UK. There is some more pump storage possibility, but the electricity storage we have is less than a 1,000th the size of our gas storage. We are talking about quite small amounts of storage, for short-term problems. The chance that the UK could find enough pump storage to cover a day, much less a week, is virtually nil.

Viscount Hanworth: We have run out of Welsh mountains and Scottish mountains.

Malcolm Keay: Scottish mountains.

Baroness Sheehan: I am still confused about the conditions under which we can take part in the IEM versus the market coupling arrangements. If you are submitting more written evidence, a note on that would be helpful to me.

The Chairman: Good. We are staying with interconnectors with Viscount Hanworth.

Q6 **Viscount Hanworth:** We have discussed this already. The formal text of my question is, to what extent is the UK reliant on interconnectors with the EU and the EEA for secure gas and electricity supplies, and are those at risk post Brexit? I heard Malcolm Keay say that we import about 5% of our annual electricity need. Actually, I believe that in 2014 it was closer to 9%. I suppose it is imponderable—

Malcolm Keay: It was about 5% last year. It varies a bit, but I am not sure that it was ever as much as 9%. Gas is a bit different. Most of our imports are from Norway. I do not know whether that will change significantly after Brexit. Technically, Norway will be within the EU system as far as security and so on are concerned, so it could make a difference. We also have quite a large capacity for importing liquefied natural gas, which is underused at the moment. We could import a lot more energy from anywhere in the world. All of that is outside the EU and is very flexible. The only issue might be price. It might cost more. It is as much a price as a security issue.

Viscount Hanworth: Secondly, are the interconnectors—particularly the oldest interconnectors—at risk in consequence of Brexit, or is the road ahead clearly mapped out, at least in the medium term? I am aware that the IFA2 interconnection was subject to a hiatus for a while. Was that in consequence of Brexit, or were there other issues? Are doubts arising

about the future programme for interconnection?

Malcolm Keay: I do not think the current interconnectors are at risk. For future interconnectors, the economic case has probably not changed, but people want to think a bit because of questions about the sorts of issues we have been talking about—who will have jurisdiction? At the moment, within Europe, you have to go one of two routes: to be a merchant, where the interconnector builder takes the risk, or to take a regulated route. The regulated route is subject to various EU rules, if you build it as national grid, for example. There is a question about what the rules will be in future; it arose in the IFA case, because the French regulator was not quite sure what the position was going to be. It is not that it is impossible to build new interconnections—we commented on the examples of Iceland and Norway—but that there is a bit of uncertainty at the moment about what the rules are going to be. The trouble is, it is not clear how long it will take for that uncertainty to be sorted out. It could be some time before we know the future situation, especially if there is a transition period, because then it will be three or four years before we get to any outcome.

Viscount Hanworth: If I may be naive and ask an open-ended question, is there a degree of interconnection that would be sufficient to overcome the intermittency of our power generation as it will be in the future?

Malcolm Keay: As was said earlier, the more interconnection you have, the easier these things are to manage, but remember that we are in north-west Europe. The same wind blows across us as across north Germany. The same solar conditions are here. In a way, if we wanted to make a real difference, we would have to import solar power from Spain or north Africa. There are various problems with that looking forward. As I said earlier, we might have to concentrate our minds and think more closely about what we do within the country.

Viscount Hanworth: Are there any substantial studies on the meteorology of the area, as it applies to power generation?

The Chairman: We have to move on. A couple of other members want to come in; I ask them to be very brief. I want to move to energy influence, particularly the funding and research side, which is equally important. Perhaps witnesses could add any extra comments in their responses to those questions.

The Duke of Montrose: My question is on interconnector trading. I declare a personal interest, as a major holder in a small hydro-electric scheme in Scotland.

I do not know how much renewable energy forms part of our interconnector trading with Europe at the moment, but presumably it qualifies under the European renewable trading scheme and perhaps would no longer qualify once we had left the EU.

Joseph Dutton: The ETS is an interesting one, because the current phase is due to end in 2020. We are unsure when we will come out, but that is when the phase we are in ends. There is agreement among the major companies in the energy sector to stay in until the end of the current phase, even if that goes beyond our membership of the EU, rather than destabilise the situation. How that will happen we do not know, but the phase ends in 2020. There is disagreement, and no common position, on whether we enter the second phase, which runs from 2021 to 2030. Regardless of whether our energy sector can agree on that, how we do it is another thing completely, again because of how it comes down to ECJ jurisdiction and things of that sort.

To go back to the point about investment, certainly in infrastructure, although the UK will still have interconnectors built in the future, there is already a drag on the new projects because of the regulatory uncertainty, which is affecting the investment. Ireland is moving away from a new one that it was going to build to the UK and is now building one with France. That has been accelerated. With the new one to Iceland, the Government have said, "Sort out your regulatory situation and how we are going to do this in the future. Then we can develop this new interconnector". France has said the same. It is very difficult to invest in new infrastructure if you do not know what the regulatory framework to operate it will be in two years' time. That is not a solid basis on which to invest huge amounts of money.

It is a real problem for the UK. The Treasury estimated previously that by the early 2020s we needed £275 billion spent on our energy system, across various things, and 40% of current investment is foreign direct money.

The Chairman: We will come on to that.

Joseph Dutton: As regards what we do, we have real regulatory stagnation and we cannot offer clear signals for investors beyond the end of the decade. That is already starting to slow down how they are investing.

Lord Curry of Kirkharle: I have a quick question for Mr Keay. Are you saying that we would not be able to do a direct deal with Norway on gas because of its current commitment to the European Union?

Malcolm Keay: I am saying that Norway is engaged in the European Union emergency arrangements, when there is a gas supply emergency. If there were an emergency within Europe and their sharing arrangements were set up, but we were outside those arrangements, it could have an impact on us. I am sure that we will go on getting gas from Norway, as before, but Norway has a degree of flexibility on whether it supplies directly to the UK, to Europe through the UK and so on. We could be affected, if we were outside the European Union security arrangements. That would only be an emergency problem. It would not apply to normal trading. Presumably that would go on as normal.

Joseph Dutton: There would be an effect on supply. It is being recognised within the sector, which is asking questions. As I mentioned earlier, already the UK is no longer the most liquid market in Europe for gas; that is the Dutch TTF. Depending on the final settlement with the EU, if regulatory and trading friction is placed on the movement of gas between the UK and Norway, which is in the internal market, and between us and the rest of the continent, it will raise the price of the gas that is being traded, which will affect the dynamics of how the trade moves between the UK and other markets. It could lead to a knock-on effect, where liquidity in the UK market decreases further, which makes us less attractive to LNG coming in. In the rest of Europe, there are huge amounts of capacity to import LNG that are massively underutilised. It is at only around 15% capacity this year. It is not an immediate cliff edge as regards supply, but a gradual build-up of things that change the nature of the operation of the market that we have built over the last couple of decades. There is friction placed on that, which changes how the market works and could leave us more isolated.

The Chairman: We might come back to some of those issues as part of the finance side. Can we move on to energy influence?

Q7 **Lord Selkirk of Douglas:** First, I mention an interest as chairman of a small family company that has planning permission for at least one wind turbine in the west of Scotland.

To a large extent, you have already answered the question that I am about to ask. In the interests of clarity, may I put it to you that it is likely that UK and EU energy policy will diverge if no longer bound together by EU membership? If that is your view, to what extent do you think that it will diverge or is likely to diverge?

Georgina Wright: The UK was a key driver behind the creation of the internal energy market. If the UK sees membership of the internal energy market as in its interest, divergence is unlikely to be great over the short to medium term. Of course, the extent of divergence will also depend on the UK's industrial strategy post Brexit, particularly on rules for state aid and competition, as the EU has made it clear that those might distort the level playing field and affect the future free trade agreement, if there is one, between the UK and the EU. There is also the extent to which the UK and the EU see UK membership of the internal energy market as in their interest.

Longer term, the energy sector is going through profound change. We will have to see what impact the increased use of renewables has on the energy system. All of that is difficult to predict. Over the long term, divergence is probably more likely, but it is difficult to predict at this stage.

Q8 **Baroness Sheehan:** My question is again about influence. How much influence will the UK have over EU energy policy once it is outside the EU, either as a member of the IEM or not, given that the UK's main avenue of influence currently, apart from the legislative process, is through its

active membership of EU co-ordinating bodies, and our role in those will be reduced?

Joseph Dutton: There is a certain irony in that after we leave the EU we could have more people there than we have now. For example, one of the ways Norway exerts influence is by having a huge amount of lobbying power based in Brussels. It has a very big building that represents the interests of its companies, a lot of which are in the energy sector. It does that through lobbying—through soft power—but ultimately, when it comes to the formal decision-making, it is sometimes literally excluded from the room where the voting takes place and the formal things are worked out.

The UK will have a really important role in the so-called BINGOs—the business NGOs, of which there are lots in Brussels. It is important that the UK remains as active as possible in those. EU membership is not required to have a role in many of them, because it will come down to soft power and lobbying. If there was a formal shut-out from the decision-making process, that is a way the UK would still be able to exert some influence.

Malcolm Keay: Europe is changing the way it develops its energy policy. Post 2020, instead of fixed renewables targets for each country, it has a collective target. The way of enforcing that, so to speak, is that the Commission will go around examining every member state's energy policy. The UK never wanted that, or anything like it, to happen. When it is outside Europe, I cannot imagine any scenario in which the UK would allow that to happen. Therefore, divergence is quite likely, because the Commission will be trying to harmonise all the other member states and we will be apart from that process.

I am a bit less optimistic about the influence that we will have on the process. As we will have removed ourselves from it, everyone will be rather reluctant to listen to what we have to say, I am afraid. Although the UK has played a major part in some areas, there are other issues, such as gas purchasing—the start, in a way, of the Energy Union proposal—where the UK was always one of the chief opponents of anything that sounded like a role for the Commission. It is quite possible that that sort of thing will get more centralised within Europe, with Europe moving towards becoming a bloc when it comes to gas purchasing, in the interests of security and standing up to Russia. The UK would be apart from that process, and I cannot see us having much influence on it.

Georgina Wright: The internal energy market goes beyond member states. In the EU's plans for an energy union, it recognises that there is significant need both to deepen and to broaden the internal energy market. The ability of the UK to shape future internal energy market legislation once the UK is outside the EU will depend on political will—again, on both sides—which may be impacted by the tone adopted during negotiations. There is also the institutional set-up. Will the UK and the EU want to retain strong co-operation on energy? If so, is there an

arbitration body? How about harmonising standards? Finally, there is institutional capacity, which both Joe and Malcolm have mentioned—increasing the UK presence in Brussels, in different member states and in regional bodies and associations, as well as government capacity to enable us to monitor that.

Q9 Lord Rooker: Good morning. You have virtually answered the question that I was going to ask. First, I declare an interest in the Ludlow Hydro Co-op, which operates an Archimedes screw on the River Teme. We have not generated much electricity this summer, by the way—there has not been much rain in Wales.

The question is about leadership. We are always told that the UK is a leader in this, that and the other. Most times, I dismiss that kind of stuff, but the evidence is that we have been a leader in liberalising the energy market in the EU. Do you think that the others still see us as a leader? Clearly, we will have a diminished role in leading policy changes once we are outside, particularly if we are shut out of the rooms on occasion. Are there any distinctive roles, separate from government, that business and the companies themselves could play? We cannot keep a leadership role—we cannot claim that we are the leader, as we are no longer in the club—but the point is to have influence.

Georgina Wright: There is evidence to suggest that the UK has already gone from being a key political actor in this field to a technical consultant. At least, that is what I was told when I went to Brussels. In the paper that we published with the University of Exeter and the UK Energy Research Centre, we go through the example of network codes. The internal energy market is underpinned by the energy acquis, but also lots of network codes that facilitate grid functioning. There is clear evidence that UK stakeholders—the UK Government, but also businesses and TSOs—may have reduced influence.

That being said, the internal energy market goes beyond member states. We know that the EEA has a joint committee on energy. For example, at the moment the Third Energy Package has not been deemed EEA relevant, which means necessarily applicable and required to be adopted by EEA states. It is in front of the committee, which is discussing it. Of course, throughout the process there is regular interaction with EEA members and Switzerland, but you have less formal presence in those bodies. The report goes into that in much depth, but I am happy to discuss it a little more.

Joseph Dutton: Traditionally and historically, the UK has been a driver of free market policies in energy, although in the last couple of years that has changed. If we look at proposals for price caps, the Government developing the capacity mechanism and Hinkley, there is a degree of more state intervention. More intervention to undo past interventions is probably not a great way to go, but a pattern seems to be emerging.

There could be an impact at European level. If you lose an influencing force such as the UK, which is one of the more pro-market actors within

the European Union, as it comes out, and if it takes a step back, there could be a real rebalancing of power towards more state-centric and more interventionist policies.

The Chairman: Let us move on to an important area that we have identified in the environmental sector as well, around investment and research. Lord Curry, do you want to start us off?

Q10 **Lord Curry of Kirkharle:** The energy industry has benefited, as have other industries in Britain, from EU investment, either through loans from the European Investment Bank or through grants. How important have those been to the energy sector? Could they easily be replaced by domestic facilities?

Georgina Wright: The UK receives around €2.5 billion in energy loans and grants from the EU, much of which comes from the European Investment Bank. There are three main areas of EU funding for UK energy: infrastructure finance, which is mostly through loans from the European Investment Bank; regional development grants for infrastructure and institutions; and grants for research and development. The most significant institutional loss would probably be reduced funding from the European Investment Bank. That is key for due diligence processes and project development assistance. Since the UK joined the EU, it has taken loans worth up to €30 trillion from the European Investment Bank. It is important to recognise that over 90% of European Investment Bank loans go to member states. In 2016 alone, the UK received around €1 billion for renewables and smart grids from the European Investment Bank.

Of course, there is the Euratom research budget, which is separate, where nuclear fusion receives the largest share. That goes to the Joint European Torus, for example, which is a UK-based research facility, and the International Thermonuclear Experimental Reactor—ITER—which is currently under construction in France. The UK receives around €60 million a year, out of a budget of around £2.5 billion, for JET's operation. The new phase of funding will be up for negotiations in 2018, during the Government's negotiations on the terms of its withdrawal from the EU.

Can it be replaced by domestic funding? After all, the UK was a net contributor to the EU budget, so there might be some funding available for energy projects and programmes. Of course, many industries will be vying for government funding. Then there are all the costs around the call for tender process and the management of funds. There also needs to be human capacity in government to monitor that.

Alternatives have been put forward, such as creating a national investment bank, although the Green Investment Bank was sold off in the summer. Could we create regional or infrastructure banks, or could the UK remain a shareholder of the European Investment Bank? Again, there is a lot of uncertainty around that. It would be a matter for negotiations, and for UK domestic policy decisions.

Lord Curry of Kirkharle: Can you explain to what extent the benefits that we have had from the European Investment Bank have been linked to infrastructure projects across Europe to do with the interconnectors? Has it all been linked together as regards infrastructure?

Georgina Wright: I do not have the figures, but I know that in the report we look in more depth at how it was spent and for what projects. I do not know off the top of my head. I can revert back.

Joseph Dutton: I do not have the exact figures, but funding is provided through the Connecting Europe facility. That trickles down to projects to develop the interconnected energy marketplace. Projects in the UK to develop interconnectors between the UK and the continent and between the mainland and Ireland, linking Northern Ireland to Scotland, have received funding via the facility. It is something that Ofgem has encouraged project developers to do, because the money is there.

There are some concrete examples. A number of offshore wind farms have received money, as have biomass facilities. Funding has been provided for things such as the early phases of laying cabling for wind farms offshore and, of course, for our universities. The big issue is obviously Horizon 2020 and what happens with that. From both a policy perspective and an engineering perspective, universities across the UK have benefited in the energy sector from the money provided for research. At the lower level, there has been structural funding in certain regions as well.

Lord Curry of Kirkharle: So it is important in post-Brexit policy that funds to invest continue to be available from domestic sources to replace the benefits we have had through EU membership.

Georgina Wright: We are expecting a Government paper this week on the UK's participation in EU research—

Lord Curry of Kirkharle: I am talking about the capital projects funded by the European Investment Bank.

Georgina Wright: Yes. The key question is more around European Investment Bank loans and what happens to those.

Malcolm Keay: Could I add a slight qualification? These are useful sums of money, but, frankly, they are not critical. They would not prevent good projects going ahead. What matters with these projects are the terms of the projects—what prices they get under the feed-in tariff, or whatever the arrangement is. The money available for projects of common interest—the interconnectors and suchlike—is quite small. The European Investment Bank has been fairly significant, but it is replaceable. There is plenty of money around. I do not think that this is a critical issue. Obviously, it would be a pity to lose access to that money, but I cannot see that on its own making all that much difference.

Joseph Dutton: That is obviously true, but we do not know whether the Government will make that money available for the same projects. A lot

of the money is siloed off, based on aims of the European Union. Decarbonisation being a main one, the money is funnelled down to renewable energy projects. As Georgina mentioned, depending on what the direction of domestic energy policy is, a future Government could decide that those sorts of projects do not need to receive that money because they are not in line with a future industrial strategy or future energy policy.

The Chairman: Baroness Sheehan will ask a brief question, because we are running out of time.

Baroness Sheehan: Rather than talk about the future impacts of withdrawal on changes of policy from the EIB, can I ask about the impact on EIB investment funding to the UK during the Article 50 negotiations? What impact are they having on our current infrastructure investments and development?

The Chairman: Could you give brief answers?

Georgina Wright: I do not know the answer to that question, but I can look into it. What I will say is that EIB loans have been quite important in kick-starting projects for due diligence and project assistance, and then enabling us to build projects so that there is enough trust for other investors to come in.

Baroness Sheehan: As I understand it, the EIB has halted loans during the Article 50 negotiations.

Joseph Dutton: I believe that there has been a fall of about 80%; it has definitely dropped off. There is also real uncertainty about what will happen to the UK's shareholding, because currently shareholders of the bank have to be EU members. The UK has about 16%.

Baroness Sheehan: Have you seen any impact on current projects?

Joseph Dutton: You could look at wider investment, but it would be difficult to isolate whether the role of the EIB has been the determining factor in those investments falling. Certain engineering companies that have large-scale clients in big energy infrastructure have publicly reported a fall in business in the UK, but it is probably a bit more difficult to separate what is happening with the EIB from broader energy and economic trends.

The Chairman: I will have to leave it at that.

Lord Young of Norwood Green: I have a question. I will be very brief.

The Chairman: When Lord Young has asked his question, perhaps we could have a very quick answer from each of you. Then I need to wrap up the session.

Lord Young of Norwood Green: I know that you have covered this area, but could you say to what extent the UK is reliant on access to and

participation in EU research such as the Horizon 2020 projects to develop energy technologies and grid management solutions?

Georgina Wright: As I mentioned, the Government are expected to release a paper on future co-operation in EU research. If we take the case of Switzerland, that would presume some form of financial contribution to Horizon 2020 or Galileo.

To come back very briefly to the previous question, the Government have launched an industrial strategy challenge fund, which intends to make £4.7 billion available over the next four years for six key areas, one being clean and flexible energy. That might offer some additional resources.

Malcolm Keay: I have nothing to add.

The Chairman: Thank you very much for your evidence. I bring the session to an end. Thank you for going through the issues very comprehensively and starting our study extremely competently.

Examination of witnesses

Lawrence Slade, Phil Sheppard and Ian Graves.

Q11 **The Chairman:** Let us commence the second panel session in our inquiry into Brexit and energy security. I think you have heard it all before, but I remind you that this is a public session. It is being webcast and a transcript will be prepared. You will have an opportunity to correct the transcript if it has errors. I remind Committee members to mention any specific interests they might have in this session. I declare again that I am a trustee of Regen SW and the Green Purposes Company. Could you briefly introduce yourselves, not just to us but to those listening in?

Lawrence Slade: I am chief executive of Energy UK and a board member of EURELECTRIC, a Brussels-based trade association for the electricity industry whose Brexit working group I chair.

Ian Graves: I am the business development director at National Grid and am responsible for a ring-fenced part of the company separate from my colleague Phil. We do the commercial developments of competitive transmission, including interconnectors.

The Chairman: I am expecting a Chinese wall somewhere between the two of you.

Ian Graves: Ideally, I would like Lawrence between us.

Phil Sheppard: Thank you very much for inviting me. I am here to represent the system operator function of National Grid.

Q12 **The Chairman:** This is a session particularly from the industry's point of view. In your view, what are the implications of the UK's withdrawal from the EU for the energy sector and security? What advantages might there

be? What would be the impact on energy supplies of failing to reach a new deal with the EU before Brexit takes effect, and do you have any opinions on transitional arrangements? All of these are, as you are aware, very topical at the moment. No doubt all of you want to contribute. Mr Slade, can you start?

Lawrence Slade: The first point is that the whole Brexit process has created uncertainty in the market. Uncertainty in a market where you need tremendous amounts of investment is never a good thing. Secondly, as you have heard this morning, there are issues as to how our future relationship develops and how the governance arrangements move forward. Can we continue as members of the internal energy market, and how do we act within that?

As to carbon pricing, what is the relationship with the emissions trading scheme? How do we manage that going forward? There are critical investment decisions for companies looking two or three years into the future, so it is important they understand where the EU ETS is going, as well as companies looking at significant investment decisions and the structure of energy supply to the UK market.

As you will be dealing with nuclear and Irish issues next week, I will not touch on those, but there is a mix of vertical issues that relate purely to the energy sector, which in the main is the IEM, but also a significant number of horizontal issues, shared by many other industries, around freedom of movement and access to a skilled workforce. Those vary from company to company but are quite often project or contract-related where we need access to skilled workforces.

If we look through the detail of what would happen if we were to leave the IEM, for example, given the amount of work needed to be undertaken to start transferring things from EU legislation, we very much believe in and support the idea of a two-year minimum transitional period for that to develop. I think that is across the board, and you will probably hear more about it from my colleagues next week, particularly on the nuclear side.

As to how we develop our own energy policy, and how that relates to Europe, there are a significant number of discussions about how we operate in an interconnected market. It is important to remember that as far as energy is concerned we are physically connected to the 27, and vice versa. There is always a lot of discussion around what we import from Europe. Last time I checked—this morning—it was about 9% of our electricity, but there are occasions when it goes the other way. We must not forget that. Colleagues can correct me, but I think that last November we were exporting electricity to France, and that may change in the future. Depending on how policies work, the interconnectors may flow both ways. The main gas interconnector can and does flow both ways. It is important we recognise that there are issues for today, but there are also issues as to how these markets might develop and diverge if the UK loses its significant influence on how the energy sector is developed at the moment.

Ian Graves: Lawrence has covered many of the issues. I was going to start by reflecting the fact that, as he said, this country is already connected to the 27. Currently, we share 4 gigawatts of electricity interconnection with the EU, including 1 gigawatt to Ireland, and a further 4.8 gigawatts are already in development by my team at National Grid. That is our Nemo Link, NSL, IFA2 and Viking. Interconnection helped the UK to import about 17.5 terawatt hours of energy during 2016, which is equivalent to the energy requirement of about 5.5 million homes. It is making a significant contribution.

As the previous panel said, there are estimates that 1 gigawatt of electricity interconnection capacity can reduce wholesale prices in the United Kingdom by about 2%, so continued investment and delivery of the energy policy that gives rise to that connectivity is seen as a good thing. Of course, those projects are all joint ventures between companies like my own and often the state-owned organisation of the country to which we are connecting. The issue around certainty for the future is the key point to take away from the first introductory comment you made. Anything that can be done to ensure that during those transitional arrangements whatever changes take place are done in a way that enables the operators of the assets to develop the systems and processes required for continued efficient operation would be most welcome.

Phil Sheppard: From the system operator perspective, we have seen the benefits of being party to the IEM from security of supply and the diversity of supplies we are connected to within Europe. Ultimately, this is leading to cheaper prices for consumers, and gives the market and the system operator flexibility in how they operate the network. At the moment, the electricity interconnectors are used by the market to help balance the intermittency of renewables. They are one of the key tools in helping to manage the wider integration of renewables to the network. In the changes that will come, the closer we can be to the IEM, the less disruption there will be for the market, but there will be changes to the market arrangements. Obviously, there will be some necessary legal, process and regulatory changes. At the moment, a lot of the trading across borders relies on common platforms. If we come out of the IEM, we may need to replace those platforms as a market operator.

The Chairman: Can you describe for us what you mean by a platform?

Phil Sheppard: It is a trading platform. There are various mechanisms that allow us to exchange data, as well as pricing, and manage flows across the border.

The Chairman: Thank you.

Phil Sheppard: There needs to be a clear implementation plan. Whether or not that includes a transitional period, the more clarity the market has, the more likely it is to deliver it in a transparent and simple way, and ultimately reduce the costs and risks of doing so in a relatively short period. I will not repeat the messages from my colleagues.

Q13 Baroness Sheehan: To what extent does the UK rely on non-UK EU labour to construct, maintain and operate the energy systems? Mr Slade, you talked about some of the horizontal issues. Could you just take one of those?

Lawrence Slade: It is probably a better question for my colleagues from the nuclear industry when you speak directly to them next week. However, they have provided us with some initial thoughts on that. For example, at the plant in Flamanville, I believe about 30% came from EU sources¹. If you transferred that to Hinkley, it would be around the 7,500 employment mark, so it is a fairly significant number. Across the UK industry, the percentage of EU workforce varies from 1% to 5% in the companies we surveyed. The difficulty is that it depends on the contracting market, particularly the engineering and support side; for example, an increasing number of EU nationals are working across the smart metering programme. It is a growing impact, and we will be happy to provide more information to the Committee in a written response.

The Chairman: That would be useful. Thank you for that. Did you want to come in, Viscount Hanworth?

Viscount Hanworth: You caught my facial expression. I understand there are not enough welders or concrete pourers available in Britain at the moment to satisfy Hinkley C and the various other infrastructure projects. Can you comment on that aspersion?

Lawrence Slade: I can give you some information from the UK Office for National Statistics and the Construction Industry Training Board that indicates that approximately 12% to 15% of UK construction labour comes from inward migration, so it is a fairly substantial number. Not wishing to denigrate anybody, the complexity of energy projects is such that we require a highly skilled workforce. It is important that everyone involved understands that this labour cannot be replaced overnight. I personally think—I am sure many colleagues agree—that having access to an indigenous workforce of a skilled nature is obviously a good thing for the country, but it does not happen overnight. At the moment, as an industry—we share this with many other sectors in the UK—access to that skilled, flexible workforce is essential.

Ian Graves: The ability to train new UK people by being part of a multicultural team developing these big infra projects is very exciting. It is one of the ways in which we attract people to help us to develop such projects. Any multi-billion-pound project is extremely attractive to lots of very talented young people in the United Kingdom, as well as those from Europe. By bringing together that group to do the job, we generate the next group of engineers who can help us with the next project. That is a big part of what we do.

The Chairman: Perhaps we could move on to UK-EU energy co-operation.

¹ Note by witness: this refers to non-French EU nationals.

Q14 Lord Krebs: I think we have touched on this already, but I would like to ask a question and give you a chance to answer it more fully. What energy-related co-operation does the UK need from the EU? In order to get that co-operation, do we necessarily have to be in the internal energy market? There are two points underneath that. First, how exposed would we be if we were not included in the gas solidarity mechanism? I think the second one was touched on by Phil: what access to data do we have from our membership of the internal energy market? Is that data useful and necessary? If it is, could we preserve access to it after Brexit?

Phil Sheppard: I will try to cover several aspects. Certainly, by mutual co-operation and facilitating the delivery of affordability and security of supply for climate change, the IEM provides a stable and clear framework for investment. The facilities we enjoy as a result of being able to share data are essential from an operator perspective. One of the aspects of cross-border trading is that you need to know what the flows are likely to be at the day-ahead stage, if not longer. In the earlier session, we touched on the intraday and day-ahead trading markets. All of those operational data flows and emergency co-ordination are part of the IEM. In whatever way the IEM is replaced, we would have to replace that process in some form or other; we would still need that data and information.

Specifically on gas solidarity, we already have robust plans in the UK for managing scarcity of gas. They are very well practised, but they already include co-operation with neighbours with whom we have interconnections, whether Ireland, Norway or the rest of Europe. We would not have that as another tool, but regardless of that, through emergency co-ordination we would still have conversations with our European partners.

You cannot operate the system in an interconnected world without data flows. However the rules are changed, before we get to Brexit day one focus has to be on how the operational and market data will flow. There are Regulations on market transparency. If part of those fell away, we would expect Ofgem to replace them, because visibility for trading across the interconnectors and within the UK is very important for keeping prices liquid and reducing the cost to consumers.

Ian Graves: I have little to add. As a private developer of these sorts of assets, the ability to continue to trade those we have now in an effective and efficient way is really important. That requires a great deal of co-operation, and we have a starting point that works. Something that looks and feels like that starting point in the future would be of obvious benefit. For the new assets I am developing, I assume there will be a similar process in place. Certainly the people on the other end of the link require that to be the case and are optimistic that something will be in place. Interconnectors benefit both parties because, as Lawrence said earlier, the electrons flow both ways, so they are of mutual benefit. It would make sense to me as a developer that there are arrangements in place to enable that to continue.

Lawrence Slade: One of the things required is to retain our influence over the evolution of the regulatory framework within which we operate. One of the little-known successes of our involvement with the European Union has been that the UK has a significant influence over those bodies. There are four in particular. I will spell them out rather than using their acronyms: the Agency for the Cooperation of Energy Regulators; the Council of European Energy Regulators; the European Network of Transmission System Operators for Electricity, and its partner the European Network of Transmission System Operators for Gas. Our involvement in those at the moment is at the front line. As Phil mentioned, our continued involvement is important to ensure that the flow of energy, be that electricity or gas, continues unimpeded.

Further on the regulatory side, it is also related to how we manage the development of areas such as REMIT, which covers trading, and MiFID II, which is designed to look mainly at the trading of financial instruments, but commodities such as energy are also covered. We need to make sure that we are still in the room having those discussions. If we had not been in the room when those discussions took place, the trading of energy might be a rather more expensive issue for us today.

The Chairman: MiFID II has not come into our discussions before. Commodity trading is a very important and interesting point.

The Duke of Montrose: Once again, I declare my interest in a small hydro scheme.

Currently, are there any cross-border emergency arrangements in place? If Brexit goes through, what chance is there of maintaining emergency arrangements?

Phil Sheppard: There is cross-border co-operation, often on an individual basis. There are things we can do with interconnectors. Because of the nature of their design, interconnectors are direct current devices, which means they are much more controllable than normal generation. We have bilateral agreements.

The Duke of Montrose: At short notice.

Phil Sheppard: Very short notice, sometimes in milliseconds of operation time. Some of them can be pre-set, so they are automatic; others we can call on as operator to operator. We have all those in place today, but effectively, because of the nature of the interconnector as a joint venture, they are a country-to-country arrangement.

The Duke of Montrose: Will they be maintained?

Phil Sheppard: We would seek to maintain them. They are beneficial to both parties.

Viscount Hanworth: Did you say that the interconnectors were DC rather than AC?

Phil Sheppard: All the interconnectors are DC.

Viscount Hanworth: Are there massive transmission losses?

Phil Sheppard: No. The reason they are DC is to reduce transmission losses.

Viscount Hanworth: Is that because of the difference in voltage and frequencies?

Phil Sheppard: It is the nature of the physics of the cables and their length. I will stop there.

Q15 **The Chairman:** I thank the Duke of Montrose for an important point. As you will be well aware from the news, the big Bill starting its passage in the House of Commons is about maintaining the acquis in the UK immediately so that there is no break or legal uncertainty. On day one, everything is exactly the same, but thereafter we have the opportunity to take back control. What would you like to see remain in this area on the UK side, and what would you like to see change in energy policy and energy legislation?

Lawrence Slade: It is an interesting question and rather begs another one: what is UK energy policy moving forward? If the UK is, as the indications are, still committed to decarbonisation of the UK energy sector, not very much will change in many respects. We have our own national targets that we are legally bound to meet. They will still require significant investment in low-carbon generation. As we have heard, interconnection is one form of managing the variability that comes on to the system in that respect. Overall from an industry perspective, I hope we continue on the route to a low-carbon economy and, therefore, decarbonising our generation sector, and not a lot will change.

We need to look at how our relationship with Europe continues along the regulatory issues we have just been talking about and at how we provide long-term visibility to organisations that wish to invest in the country, in terms of our long-term policy and our relationship with Europe. That is what will get the investment flowing that we need to renew our system.

Phil Sheppard: From a narrow system operator perspective, being able to trade products to help balance the system and fine-tune supply and demand close to real time, and maintaining access to cross-border products, will be important to us, using the interconnectors as a cheaper way of balancing the system than using generation or supply at the moment. Trying to find ways to maintain that access and those tools will reduce the cost to the end consumer in the short term.

The Chairman: As the national system operator across energy broadly, what are the things in respect of which you can say on day plus one, or even year plus one, "We have got rid of those shackles and we can do something different?" Is there anything like that?

Phil Sheppard: Nothing springs to mind. Part of the role of the system operator is to maintain a level playing field for different technologies and support government energy policy. The big change we can see coming is the policy that will be adopted on how to decarbonise transport and heat. Those are the two big conundrums coming. Although we can continue to facilitate renewables, depending on the approach and timing, those are the big changes, as well as how to introduce storage effectively into the network.

The Chairman: Those will be challenges whether we are in or out.

Phil Sheppard: Exactly.

Lawrence Slade: There is a tremendous opportunity for the UK to show leadership. There is a lot of talk about what we take back or what we remove. Why do we not look at what we can deliver and show global leadership in? To take offshore wind, for example, we have shown what can be done if you give long-term visibility in helping to drive down costs. As part of leaving the European Union, why do we not say, "We are absolutely committed to creating a low-carbon economy. We will steal a march and deliver that, and put our money where our mouth is and drive forward that investment"? That is a big opportunity, and it would send a clear message around the world that this country wants to move forward and develop the skills base and the companies, and this is how we are going to do it.

The Chairman: Maybe state aid would no longer be an issue. Does that help, or does it not make any difference? Are state aid rules something we quite like?

Lawrence Slade: One of the issues with state aid is that it is dependent on your future relationship with the EU and other trading blocs. It is a misunderstanding to say that we will have complete freedom on state aid in the future, because it depends very much on the relationship we have with our trading partners in the future.

The Chairman: I suspect you are right.

Ian Graves: From a business point of view, we evaluate every project in a pure way and then work with our Treasury colleagues to see how best to fund it, so we do not necessarily factor in preferred arrangements or all those things. I was talking to the CEOs of some other European energy companies in a forum where I represent National Grid in Brussels at the moment. They reminded the European negotiation team, whom we were lucky enough to meet, that there was energy co-operation across Europe before the EU was developed. Within our sector, there was always quite good co-operation between companies prior to the EU being developed as an entity and legislation being formed. There is no reason why that would not continue moving forward. It was there just after the war and there is no reason why it will not carry on.

The Chairman: Does the fact that the UK energy industry, unlike the

system operator, is almost entirely foreign-owned, even in oil, make a difference?

Lawrence Slade: I do not think that, strictly speaking, that is correct. There are a number of foreign entities operating in the UK. There are also several very large UK plcs, all of which contribute massively to the UK economy. We will shortly be publishing a report on investment in the UK energy sector. From a financial investment viewpoint, the best thing that can happen—I hate to say it again—is clarity on future UK Government energy policy. If you give us that clarity and framework, the industry has the skills, regardless of ownership, to build and renew our energy infrastructure.

The Chairman: We will come to the investment side later. Let us move to interconnectors specifically.

Q16 **Viscount Hanworth:** What steps will it be necessary to take to ensure that interconnector trading remains efficient post Brexit? Do you envisage a major impediment in the transmission from day-ahead trading to intraday trading?

Ian Graves: No. From a development point of view, my role and that of companies like mine is to build the capacity. There are products that use that capacity basically to move the electrons into the right place, where the market wants them to go. Intraday trading and other mechanisms for doing that at different speeds with different frequencies are all products that will just use the asset I build. From that point of view, having a joined-up form of regulation and rules set in legislation to enable that to continue is the critical thing. As I said earlier, we have something with the IEM that works, and we would actively encourage a situation where, after the negotiations are concluded, we move to a new forum where something the same or at least similar is in place. Of course, that is for the benefit of the country we are connected to as well, so it is a true mutual benefit.

Viscount Hanworth: You do not seem to have great anxieties. The importance of interconnectors will be determined partly by the extent to which we acquire our power from renewable resources. Has there been any significant scenario modelling by National Grid to assess the extent to which interconnectors will be able to overcome this intermittency, particularly taking account of the meteorology of the European Union?

Phil Sheppard: Yes. We publish on an annual basis a document that we call *Future Energy Scenarios*. That looks at four different, self-consistent, credible, plausible futures that include penetration of renewables or the timing of decarbonisation of heat, and all the different aspects. From that, we can look at how the market might respond to the decarbonisation challenge and, therefore, the volume of indigenous generation, the different mixes, the penetration of battery storage or other forms of storage and the benefits of having interconnection or indigenous generation. Looking at that as a whole, what challenges will that present for us in the market going forward, and what are some of

the tools and products we might need to operate the system economically and efficiently in the future?

Viscount Hanworth: The sun does not shine and the wind does not blow uniformly across large areas of Europe. Does that not impose limits to the efficacy of interconnectors in overcoming our own intermittency?

Ian Graves: When we are looking to build an interconnector with our joint venture partners, we do a thorough analysis of the energy markets in the two countries we are connecting. From the United Kingdom perspective, obviously our situation is relatively straightforward. We are a small island and we know what our generation is today; we know what it is likely to be in the future for the life of the asset, and we model, predict and run various scenarios. When connecting to a country in mainland Europe, their energy market is often affected by the other countries around them. It is not necessarily the case that if I build an interconnector to, say, France I am looking exclusively at all the conditions just in France, because France is also connected to Spain, Germany and other countries.

The factors that can influence that market are often more than just regional weather information, or a particular renewables policy. For example, I am interested in the German elections. My team recently prepared a model for me on various scenarios in the German elections, because, even though I do not have a cable connecting the United Kingdom to Germany, it will have an impact on power supplies in France, Belgium, Denmark and other countries with which I am choosing to connect. As a consequence, my colleagues, and my superiors on the National Grid board, would like to know that I still have a valid project moving forward. There are very complex models that look into all sorts of different things.

Viscount Hanworth: The spikes are liable to be synchronous rather than asynchronous across wide areas of Europe.

Phil Sheppard: From the perspective of security of supply, without going into any detail, the Government's capacity mechanism looks to make sure that we have the right standard of security that takes into account the volatility of wind and level of interconnection, and then de-rates things appropriately to take into account the longer-range scenarios for weather patterns across Europe.

Viscount Hanworth: We can be assured that this is well in hand.

Phil Sheppard: The Government are happy with the security standard they have adopted.

Viscount Hanworth: That does not give me too much reassurance.

Q17 **The Earl of Stair:** I want to turn to the investment side on interconnectors. A lot of investment is coming from the private side or from European funding sources regulated by Europe. Is it going to be harder to secure approval and funding for interconnectors after Brexit? I

want to split my question into two parts. Perhaps you would develop this first. Will it be harder to obtain funding for interconnectors?

Ian Graves: The short answer is that I do not believe so. The energy policy of the European Commission is proactively still to encourage interconnection, so from the point of view of the countries and organisations I am working with and connecting to, they are still being encouraged to develop more interconnection. The factors driving that are each country's ability to access the social welfare of the proposed interconnector and the benefit it can provide its customer base. There is still overwhelming European political support for further interconnection where it benefits consumers, so from that point of view the projects are still attractive.

If the regulatory and legislative frameworks that enable trading across the interconnector are as straightforward and efficient as they currently are under the IEM arrangements, there will still be projects that attract global investors in capital. At the moment, without wanting to anticipate what the future arrangements might be, the ability to attract funding for these types of projects is still there.

The Earl of Stair: That is looking at future projects. We have various projects under way at the moment. I am from south-west Scotland where we watch pipelines heading for Ireland. Are any existing developments currently under threat? Have any doubts been raised about whether deals will need to be renegotiated, or are we progressing with plans as they stand at the moment?

Ian Graves: From a National Grid point of view, we are progressing with plans. We currently have three interconnectors under construction: NSL, Nemo and IFA2. All of those have been unaffected by the process. The Viking interconnector project goes for National Grid financial investment final approval in March of next year. I am working with the National Grid board, Energinet and the Danish Government to ensure we have all the right things in place, with reassurances to show that it will be a sensible investment for the company.

Q18 **Lord Selkirk of Douglas:** I mention my family interest as chairman of a company that has planning permission for one turbine.

My question relates to UK energy companies retaining a role in EU co-ordinating bodies after Brexit. Would there be value in doing so, and would it help in making for some continuity? Are the prospects in that area quite promising?

Phil Sheppard: There has been real value, as you heard earlier. The UK has been a leading light in developing the internal energy market and promoting free trade. As was touched on earlier, Ofgem's role is discharged through ACER in Europe, if we can maintain access and the influence of Ofgem. I cannot go to Europe and talk to my peers without people asking me what Ofgem is currently up to, because they often see what happens in the UK market trickle through to the rest of Europe, so that would be key.

The other part, which Lawrence touched on, is that the UK transmission system operators are part of the ENTSO-E and ENTSO-G bodies. Maintaining our influence on the network codes that implement a lot of the details at a fine level and making sure that we have operation and trading that is as frictionless as possible would be very helpful.

Lawrence Slade: It is something that the UK Government should bear in mind when looking at future models, simply because at the moment each of these organisations has slightly different requirements or rules as to whether you can be a full member, have only observer status and so on. It feeds into the conversation about whether we become a rule-taker, a rule-maker or a rule-influencer. Of course, there are different models, as we heard this morning, whether you are looking at the Icelandic, Norwegian or Swiss versions, and it is important that we understand how those differences operate.

It is also important that the UK industry maintains a good presence in Brussels going forward. Brussels has a tremendous number of sector NGOs, as we heard earlier. I represent one myself, EURELECTRIC. You have a lot of influence on what goes on sitting round the board and committee tables in those groups. They are, in the main, open to EU and non-EU members. There are options for Government but also for industry as to how we maintain our influence.

The Chairman: To take the specific example of system operators, in March 2019 are they going to close your office, if there is an office block in Brussels? Will the system operator and groupies evict you? Will you still try to muscle in on meetings on your old pass? How will it work in practice? I am seriously interested. You are a key player.

Phil Sheppard: There are several aspects. We are not going to stop talking to our European partners, because we are interconnected and system operation applies across the market. As Ian highlighted, issues in Germany can cascade through the network and have an impact on us, so understanding that is really important in any case. National Grid as a system operator is a shareholder in a company called Coreso. That is a collaboration of seven transmission system operators in the western part of Europe; it is a regional co-ordination council. We look collectively at the networks across that geographic area, from Portugal to Spain to Germany.

The Chairman: That is a non-EU body.

Phil Sheppard: It started off as a separate body, but it is now becoming part of the way ENTSO-E will discharge its obligations to co-ordinate electricity flows across parts of the network, so it is becoming more relevant in Europe. Part of our objective is to stay a member, and both influence and get operational day-to-day information. We share and provide models and data, and all of that looks at the whole of the network across that part of Europe, because things can affect everybody from a security of supply and cost perspective. A good example is that last winter EDF had some issues and had to do inspections of some of its

nuclear fleet. That reduced the volume of generation in France, so for a lot of last year we were exporting energy to France rather than the alternative, because of how prices worked. That type of co-ordination and co-operation made sure that the difference in flows worked smoothly. Maintaining that aspect is very important to us.

The Chairman: Is your continued membership of that something you are negotiating, or is it being negotiated between Davis and Barnier in Brussels?

Phil Sheppard: It is part of the role of IEM. If the IEM carries on and we continue to be influencing members of ENTSO-E and ENTSO-G, we can continue that relationship. If we move out of the IEM, depending on those arrangements, we have to make a decision about what to put in its place. Are the existing ones suitable and sufficient, or do we need to do something in addition? Until that is clear, it is difficult to see how we do it. We just know that collectively, with our colleague transmission system operators in Europe, we need to do it.

The Chairman: Thank you. It was interesting to drill down there a little.

Q19 **Lord Young of Norwood Green:** Continuing with energy investment, we have been round this track a bit but it would be interesting to hear your perspective. What is EU funding used for in the energy sector? Could it be replaced effectively by UK schemes?

Lawrence Slade: We heard earlier today some of the detail on this. The message is that not insubstantial funds flow into the UK energy sector from EU sources, whether from the EIB or from the Horizon 2020 Fund, which is worth some €80 billion between 2014 and 2020. The message is that, if we are outside the EU, access to those funds will undoubtedly be reduced, if not totally withdrawn, depending on any future relationship. If we decide to continue funding elements of this, we would expect to get funding back out again. Last year, the UK received about 15% of EU research funding, for example. This is all measured in billions of euros. A big question for the UK Government is how they are to facilitate that continuing flow of investment capital, how much is coming from UK-oriented innovation funding and what methodology they might be looking to use to bring in more private capital funding, but it is another question mark for the industry.

Lord Young of Norwood Green: Did I mishear you? You referred to €80 billion from Horizon from 2014.

Lawrence Slade: A total fund of €80 billion can be spent between 2014 and 2020.

Lord Young of Norwood Green: Overall.

Lawrence Slade: Overall, not just the UK.

Lord Young of Norwood Green: The UK figure we have is €2.5 billion.

Lawrence Slade: That is about right.

Lord Young of Norwood Green: A previous contributor seemed to dismiss this problem and say that it makes a contribution but it will not stop worthwhile projects going ahead.

Ian Graves: From a project developer's point of view, I am grateful for any funding that supports my operations. I am sure that anybody who is a National Grid shareholder will be pleased to hear that. The Connecting Europe facility, which is the fund we have drawn down from very successfully, with our partners, to do some of the initial seabed surveys and exploratory engineering work on our interconnectors, is a vital part of our development of a project. We have been grateful for the European grants we and our joint venture partners have received.

Of course, some of the interconnectors we will be building will be to member states that are eligible to draw down from that funding anyway, so whether or not the funding stops, or is reduced in some way, would be something for that joint venture to consider at the time. I am sure that if we were developing another interconnector to a country where we had already developed one, and we received X the first time round and Y this time round and Y was less than X, we would be keen to find out how the Government might support the difference between X and Y. At the moment, we remain confident that that funding will still be relevant and useful. It is very important for the development of projects.

The Chairman: Coming back to Lord Young's point, Malcolm Keay in the previous session, when I think you were present, said that from a UK perspective it was great and not a problem, but when you look at it, these are very big numbers. You are saying it may not be quite as easy as that, but it is not a fundamental issue.

Lawrence Slade: I am with you, in that these are big numbers and, if it is not handled correctly over time, it could be a big issue. As Ian says, if you are building something in partnership with an EU member state it may not be an issue, but we do not know. It goes back to my opening comment that one of the issues we have is the level of uncertainty. Energy infrastructure is not built overnight. As my colleagues have indicated, the planning takes years. Whether we are talking about building a new CCGT in the UK or an interconnector, the planning process is a long one. We have moved into a period of uncertainty where potentially a chunk of funding is now unclear, and that rolls forward into the future. One of the things we are looking to the UK Government for is very quick guidance on the status of that funding.

It also goes back to things such as membership of the EU emissions trading scheme. We need urgently, by which I mean preferably next month, information from the UK Government as to whether we will still be members of the current phase out to 2020, and, within the next year, guidance from them as to whether we will be members of the next phase out to 2030. If we are not, we need to start working on exactly how that

will work in the future, because it changes the trading relationship between ourselves and Europe when we are looking at flows of energy.

The Chairman: That is very useful.

Baroness Sheehan: I have a quick question directed to Mr Graves. It is a repeat of the question I asked earlier. As I understand it, the European Investment Bank has a hiatus on decision-making during the Article 50 negotiations. How has that affected you and your projects?

Ian Graves: I was interested in the question earlier and the responses. I spoke to our Treasury colleagues when we were preparing for today. They very much described the European Investment Bank as part of their toolkit for how they would do things. At the moment, they have not had any indication—because the UK is still a voting member of the EIB board and can still influence it—and they have not seen that tool removed from their toolbox. I do not think that at the moment we have seen issues with any of the funding we have received, and it has not changed our Treasury policies at this time, but I will double-check when I get back to the office.

Baroness Sheehan: For the moment I cannot find the quote, but in one of the documents there is a reference to the impact on funding from EIB due to the Article 50 negotiations.

Ian Graves: I think I have read the same. I do not think that from a National Grid development perspective in particular we have been affected, but I will double-check that for you when I get back to the office.

Q20 **The Duke of Montrose:** To what extent is the UK currently reliant on private or foreign investment to fund its energy system? What do you anticipate to be the likely impact of Brexit on such investment?

Lawrence Slade: At the moment, we are reliant mainly on private capital for investment in the UK energy sector. There is not a great deal of government funding coming through.

The Chairman: Maybe the Chinese Government come into it somewhere.

Lawrence Slade: The UK Government, shall we say? The UK in many respects has the tools it needs to replace its generation in the UK. Phil mentioned the capacity mechanism earlier. That is in place, and it is delivering new generation. We could debate at another session whether it is the type of generation you want, but that is another matter. The policies are there to get the mix of new generation we need, whether it is new gas, nuclear, wind—onshore or offshore—or interconnectors. The important thing—I know that at times I sound like a broken record—is that, with the uncertainty that situations such as Brexit bring, it is absolutely vital that the Government show clear and early leadership in their commitment to UK energy policy.

We must have publication of the clean growth plan, clear guidance on coal closure and a clear commitment to our carbon targets. If you give the industry those clear commitments, it can go out and get funding, but every piece of uncertainty adds to the cost of capital. Every time you add to the cost of capital, you add to our domestic customers' bills, be that industry or households. It is absolutely vital that the Government step up to the plate and give us that clarity.

The Chairman: To follow that up, in our Brexit environmental report in particular, one of the positives about being in the European Union—it can also be seen as a negative from another point of view—is that policy changes only very slowly. It is very static, and therefore it is predictable and is good for long-term investment decisions. Within a UK context, there are changes of Government every five years as a maximum and then policy changes. Is that important? Could it be a problem, or is the flexibility of decision-making we will have post Brexit an advantage in the context of what you were just talking about?

Lawrence Slade: When you are looking at long-term infrastructure planning, you need certainty as to the environment in which you will be operating. Over the past couple of years, government decisions have increased the level of uncertainty that is operating in the market, regardless of Brexit. Brexit just came along and added a chunk to that. We need long-term steady policy development to allow industry to invest for projects to be built.

We need more innovative thinking in how we nurture and encourage new technologies. Reference was made this morning to the fact that we are in a transitional period moving from a high-carbon to a low-carbon energy base. You have to accept that we have to transition, and there are transitional technologies we can use, but as a country we also have a significant opportunity to step up to the plate and invest in research and development. Do not forget that a lot of EU funding is R&D-related, so we have to replace that to support innovative businesses and grow new ones that can start developing how we can use smarter grids and storage, and move that forward over the next two decades.

Lord Selkirk of Douglas: This question may be more a matter for the Government than our witnesses. Can I ask about investigations into fires in tower blocks and recommendations relating to safety provisions? Could there be any EU implications? It is probably premature to ask this question because we do not know quite what the outcome will be.

The Chairman: We will probably leave that to our colleagues in the Commons. We have not talked about energy efficiency, but the question may arise as being one of the ways you provide energy security in the long term, in that you do not need any energy. Maybe it would come in there, but I think we will leave it at that. Is there anything important that we have left out or not tackled, or on which we have not asked your opinion?

Lawrence Slade: If I may just pick up the last point on energy efficiency, obviously the work of the European Union over the last few years on certain standards, and on energy efficiency programmes and how the UK has interpreted those, has had a tremendous effect on people's bills in the UK. It is important that the UK Government post Brexit embrace energy efficiency. It is another area where they could look at it as a national programme and take a lead and a leap forward that could make a significant difference to people's lives.

The Chairman: Indeed, and to security of energy supply itself.

Lawrence Slade: Yes.

The Chairman: Thank you very much indeed for coming today and going through all these points. This is an important report, and we are very grateful for your input. If there is anything that you think in retrospect you want to add, we are still able to take written evidence, which should be directed to our policy analyst.