

Business, Energy and Industrial Strategy Committee

Oral evidence: Leaving the EU: Energy and Climate Change Negotiation Priorities, HC 909

Tuesday 21 March 2017

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Watch the meeting

Members present: Mr Iain Wright (Chair); Richard Fuller; Peter Kyle; Amanda Milling; Albert Owen; Antoinette Sandbach; Amanda Solloway; Michelle Thomson; Craig Tracey; Anna Turley; Chris White.

Questions 180-227

Witnesses

I: Dr Nina Skorupska CBE, Chief Executive, Renewable Energy Association; Nick Winser CBE, Deputy President, Institution of Engineering and Technology; Antony Froggatt, Senior Research Fellow, Chatham House; Professor Michael Pollitt, University of Cambridge.

Written evidence from witnesses:

- [Renewable Energy Association - written evidence](#) | [PDF version](#)
- [Institution of Engineering and Technology - written evidence](#) | [PDF version](#)
- [Chatham House - written evidence](#) | [PDF version](#)
- [University of Cambridge - written evidence](#) | [PDF version](#)

Examination of witnesses

Witnesses: Dr Nina Skorupska CBE, Nick Winser CBE, Antony Froggatt and Professor Michael Pollitt.

Q180 **Chair:** Good morning and thank you for coming to give evidence. For the purposes of the record to start off with, could you tell us who you are and which organisation you represent?

Nick Winser: I am Nick Winser. I am currently Deputy President of the Institution of Engineering and Technology and I am formally here in that role. I am also Chair of the Energy Systems Catapult, which is one of the most recent catapults, based in Birmingham. I am an ex-National Grid Executive, and in that role I was President of the European Network of Transmission System Operators for Electricity.

Professor Michael Pollitt: Hi. I am Michael Pollitt and I am a Professor of Business Economics at the Cambridge Judge Business School. I am an Assistant Director of the Energy Policy Research Group.

Antony Froggatt: Good morning. I am Antony Froggatt and I am a Senior Research Fellow at Chatham House, but I am also working on a project with Exeter University and the UK Energy Research Centre on Brexit and energy.

Dr Nina Skorupska: Good morning. My name is Nina Skorupska. I am the Chief Executive of the Renewable Energy Association, and in my past I have run power stations, worked on a trading floor and worked in Germany and the Netherlands, so I have a deep understanding of energy in Europe.

Q181 **Chair:** Okay, thank you. To start with, this is a question for you all: the National Infrastructure Commission has identified three areas when it comes to developing our future energy system: interconnection, storage and demand flexibilities. Are those the right areas that we need to be considering in respect of our future energy systems? Is there anything else, or do those tend to be the right things?

Nick Winser: They are certainly three of the important things; we take the view that the important thing about the energy system at the moment is that it is a moment of very fast transition and a whole-system approach is really what we need. Undoubtedly, interconnection will become more important with the deployment of renewables. Storage of energy is, of course, inherent in fossil fuels, so undoubtedly, as you take fossil fuels out of the mix, you have to replace that, so that is important, as is modifying and helping customers become more active in the market.

There are many other things that would come into that picture as well, about how to integrate all our different energy vectors together to get to the right solution and the right shape of the systems you should build into the future to get to a low-carbon, secure and affordable system.



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Q182 **Chair:** Michael, do you have anything to add? Are those the right areas?

Professor Michael Pollitt: Those are very important areas. The design of the market is very important, because there is a lot of technological uncertainty out there, particularly about the generation technologies that we might need to add to the system and about how we incorporate transport and heating into conventional sources of energy.

Antony Froggatt: Yes, I agree. From a technological perspective, it is very clear it is those three main areas for grid balancing. The only thing I would add is, as you reform and change the energy system, it is also about the governance framework: how do we make the system work most efficiently. That governance framework is not only a UK issue but, given that energy is global, about the international and ongoing European governance framework.

Dr Nina Skorupska: I welcome those three priority areas, and the REA has been leading and championing energy storage for some while now. It is the core of what will enable a more decentralised energy delivery not only to businesses but to homes—the democratisation of energy per se. I also believe we should ensure we focus on heat and transport and how those factor in. We have a housing stock and a building infrastructure that do need, in some cases, unique solutions that do not just fit a blanket electricity delivery system.

Q183 **Chair:** I will stay with you, Nina, if I can, but there seems to be broad consensus that those three areas seem to be about right. There are other things that may be added, but does leaving the EU pose considerable risks or provide any opportunities in terms of designing our future energy systems?

Dr Nina Skorupska: It is a complicated issue, as the Committee will well appreciate. It does provide a lot of risks from an investment certainty point of view, in terms of understanding the regulations. We have been consulting all our members since August, and the industry has identified that, without knowing what the relationship will be post separation from Europe, it would be difficult at this juncture to continue investment in some of those key areas, because it is about knowing the rules of the game for energy. On energy storage, let me just highlight increased tariffs; unless we have a deal around understanding how we trade, whether it is WTO or another form, some of our members have indicated that if we want energy storage to be a core of the UK's excellence and part of our industrial strategy, we could see rises of 24% on costs from South Korea. This has been highlighted already, so that is the start of my response to you, Chair, I am afraid.

Antony Froggatt: For me, probably the most important issue is interconnectors, so it is one of the three areas that have been identified and it is at a particularly crucial time. We have, as was mentioned, the need for potentially more interconnectors in terms of grid balancing, but it is important to look at where we are within investment cycles.



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Currently there is four gigawatts of interconnection between the continent and the UK and the UK and Ireland, but there are plans for that to go. What is contracted is to add another 10 gigawatts and potentially a doubling of that going further forward.

If you look at that in terms of the figures that were published last week by BEIS, they were suggesting that currently around 20 terawatt hours of electricity is imported but by the mid-2020s that might go up to 80, so four times the current level of electricity could be imported. That would make it the third largest source of electricity for the UK. We know those scenarios may not deliver what they are suggesting, but that is an indication of the use of interconnectors as envisaged. It moves it from a relatively minor share of electricity supply to a significant share. How we operate those interconnectors is really affected by Brexit; the extent to which we remain part of the internal energy market will affect the efficiency of their operation.

Chair: Okay. That is very helpful, and I will come on to that again in a moment.

Professor Michael Pollitt: I do not think that at the moment Brexit has a big impact on UK electricity or gas. We are a net exporter of gas to the EU and we do not import much electricity, and the economics of interconnectors are never optimal and it is always the case that we tend to build fewer interconnectors than might be theoretically optimal. There is still going to be a strong case for further interconnectors if they are warranted, and there is still a danger that we have distortions in carbon pricing between the UK and the EU, so we still do not know whether we are over-incentivising interconnectors in to the UK at the moment. The important thing is to get the price signals right within the UK. These issues around interconnection are of second order with respect to leaving the EU.

Nick Winser: I would differ slightly from that and probably reinforce Antony's points. We should not forget gas here as well; the gas interconnectors to Europe—to the European Union and to Norway—are, depending on the time of year, half our gas supply, so that is very significant. A lot of the gas storage is in Europe. On electricity, although we have four gigawatts and going upwards, one has to remember that that is four that can either come in or go out, so an eight-gigawatt swing is a big, big swing on the electricity system, way beyond our security standards, which are set on what our margins of security would be. Knowing that you will get a reasonably sensible allocation of those electricity interconnectors—that they are going to flow efficiently to the place that has the higher price, set essentially sometimes by security of supply constraints—will be very important. The correct operation of both the electricity and gas markets as they pertain to interconnectors is going to be very important.



These are now international systems, which are highly capital intensive, and planning these systems in an integrated way has certainly been a core part of what I used to do at ENTSO-E and what is done at ENTSG. Knowing that the whole network fits together is very important too, and being suboptimal on that could be very expensive.

Q184 Chair: Forgive my ignorance and somewhat rigidity of thought on this, but it seems to me we are going through an energy revolution where you have this big, behemoth, centralised system that is providing certainly electricity but other energy needs in one way to the customer, whether that is business or domestic. We are moving to a situation where it is more decentralised, there is better demand management and there will be a two-way process, both in terms of energy provided and the data flows. In that revolution, what is the point of having an integrated European market? Surely Brexit provides a great opportunity to push us further and faster down the revolution route in terms of that decentralised data-driven system.

Nick Winser: I am going to agree with you mainly. We currently have an energy system that is broadly built on national models in terms of how it is planned and delivered. National models have been the path for the last 100 years, and we do see a decentralised system coming very fast—a digitised system and consumers playing a much more active role. Obviously we see distributed energy in terms of photovoltaic particularly, so, yes, there is a great and massive opportunity for us being first into that decentralised market and pushing that out through export markets.

The caveat I would have is not only is the national system now having to move to be a national and local system but the economics also need to move to being an international system; the economics drive it to be an international, national and local system, so the old models of the national system will go. It needs to extend to be both more international and more local to serve the economics, and that is why getting the right deal will be important.

Professor Michael Pollitt: Gas and electricity are different. Gas is a global commodity and integration with the EU is less important, and there are plenty of examples globally of the sort of swapping that Nick is talking about. Even Russia swaps gas with some of the Baltic states between seasons, so there is very little international evidence to support the idea that we would not make these big seasonal swaps to mutual advantage.

Electricity is different; people prefer local electricity. One can imagine electricity coming from the Sahara and a grand European and North African electricity system, but just how likely is it that consumers in the UK will want to pay for electricity from the Sahara? One can imagine a future that is more heavily integrated than now, but one suspects that the more local vision with people relying on national renewables, with limited interconnection, is the more likely one.



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Dr Nina Skorupska: It is an interesting time that we have, because it is a revolution in considering our electricity market, including heat. We need to include transport in our electricity structure though, because of our desire to introduce further electric vehicles and charging. At the moment, investors and developers in this revolutionary market are still working hard to understand the appropriate price point, and that is against understanding what the UK electricity market is, which is vastly influenced by European energy markets. There is this push and pull of understanding what comes first, and we could be at the forefront of developing innovative power-purchase agreements for industry. You can take on board more renewables and almost be the prosumers per se, but at the same time to not make sure that this is in line with the developments that are happening within the electricity market and energy market in Europe would be a risky basis on which to understand how well we can develop our own market. It is complicated: there are huge opportunities but it is difficult to resolve at this time.

Antony Froggatt: On the point about seasonal differences, in a system that is more dominated by renewables, there are times of the year when you will be wanting to get energy from other parts of the system. In terms of when the wind is blowing in Norway or Denmark, the electricity may be cheaper and it may be good for us to be able to access that. Likewise we may want to export electricity when we have particular conditions. However, in the winter months when there is less sun, if we have a system that has lots of solar on the grid, we may want to be importing more from other places. Having that flexibility to enable you to import electricity from other parts of the world or other parts of the continent is really important.

Q185 **Anna Turley:** On system divergence, the REA in particular has said that is a key priority for Brexit negotiations. You have highlighted some of the risks of system divergence, but could you perhaps give us some advice or some advice to the Government on how these risks might best be mitigated?

Dr Nina Skorupska: In our journey, along with you, we were pleased to hear about the Great Repeal Act and the fact that the UK has been leading in establishing key energy policy. The point that we would be making is that we need to be engaged with the future energy market developments in Europe. We need to be influencing that as much as possible, right through up to when the UK does separate.

The indications are that we will not be part of an internal energy market, given the statements we have heard about not wanting to be part of the single market as well. All of those aspects are around understanding how that will deliver on not only the UK's energy reliability systems but our climate change commitments. It really needs to be carefully looked at. We cannot wait until when we exit to suddenly start thinking about how we ensure our market rules and the way we interface with Europe are



aligned. We have to be working on that right now to give that certainty to why people should continue to invest in the UK.

That divergence is very particular, but I need to also point out for our members in Northern Ireland that they are very concerned about what the Irish single energy market will unfold to be, because there is a stronger dependence across those two regions. Any concerns that we have in terms of the relationship with mainland Europe have to be thought threefold for the Irish situation. We have some good ideas and we would be happy to take and send separate thoughts to Committee at another time.

Antony Froggatt: The first point to note is that the energy markets are continually evolving. It is not a static issue. If you look at the European market, liberalisation started in the 1990s. We are now in the process of discussing the fourth package—the fourth set of legislation. The UK should have had the presidency of the EU in the second half of this year, when this fourth package will reach part of the political discussion. Already we see a significant loss of influence within the future market framework.

There is no doubt that the UK will continue to be active within the European market. Whether or not we will be an integral part of the internal energy market is the question, and I do not think that is ruled out. The question will be the type of disputes mechanism and resolution processes that can be introduced, because other non-member states are intricately part of the internal energy market. For me, the key question is the extent to which the UK can adopt, either on a bilateral basis or within a multilateral framework, a new system that enables us to still take part. It is clear that we will not have the same level of access; we will not have the same level of decision-making. For example, we will not be part of the European Commission, we will not be part of the European Parliament and we will not be part of the Council of European Energy Regulators, but there are other broader European systems and networks in which we can still have influence.

Nick Winser: Can I just add a point about export markets from your point about divergence? There is a real opportunity for us to be in the lead on products and services for localised, decentralised markets. We need to be cautious that we do not end up with the standards for the delivery and design of such products diverging from what is going to be agreed on quite a centralised basis, because of the integrated nature of the system across Europe. It is a key export market for us in terms of those new products and services for the digital decentralised energy system.

Q186 **Anna Turley:** That takes me on to my second question, which is about being positive and looking for opportunities. Do you think there is perhaps a way that we can now target and support new technologies and new solutions for the UK market and more broadly as well? Can you see



that coming out Brexit?

Nick Winser: That is what I am involved in with the Energy Systems Catapult. We are looking very much at where we can help SMEs and other entrepreneurs bring through new products and services. We expect the energy system of tomorrow to be very different from what we have today. In some senses it will be more complex, certainly involving customers much more actively with a much greater mix of national, international and particularly local, so there is a real opportunity for us there.

To reflect one of Michael's points, we still have a relatively small amount of interconnection on electricity, so we are a bit of an island system. There is a great opportunity for us to innovate and to look at those products ahead of other countries.

Professor Michael Pollitt: One always has to recognise that, in a sense, the single electricity market and the single gas market are answers to yesterday's problem, especially in electricity, where we had a sort of halcyon period where we had a fossil fuel-dominated system and we had this great new technology, which was CCGTs for gas, which almost equalised the price in producing electricity—the marginal cost of electricity—across the EU, and it facilitated energy market price-based investment. That system is now broken and it plainly does not work.

The Winter Package, which Nick has mentioned, begins to recognise that. We basically have European Governments deciding on which technologies are going to be invested in across the EU, and Governments basically control all of the new investment in the energy system with respect to electricity, even though we might have efficient trading at the operational level. Clearly we are into a new phase of experimentation, because I do not think anybody really knows where go from here. If we are serious about our climate targets and the implications that has for increasing renewables on the system, we are going to see divergence between countries and the way they run their electricity systems, and that does provide an opportunity for the UK. If we are serious about our targets and we are serious about achieving them in a way that demonstrates how to achieve them to the rest of the world at low cost, we should take that opportunity to be a demonstrator of how to do this. We should see ourselves as a California or a New York within Europe, where we are doing things differently and we will organise our market differently if that is what is required.

Q187 **Chris White:** I have a slightly different topic but one we keep returning to on this Committee. In terms of skills, how reliant do you think the UK energy sector is on access to skills and a flexible labour market from Europe, and, particularly, in what sort of areas do you think we are most reliant?

Nick Winser: It would be fair to say that the engineering profession has been concerned for about skills gaps for at least a decade. We continue



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to see intervention by a lot of energy companies to offer bursaries, sponsorships and apprenticeships; it is a very active place, and there is a lot of working together between energy companies. That is a real sign that it is seen as a common threat and has been a common threat for some time, as to whether we are getting enough well-qualified engineers and technicians into the system. That has been well reported through the Royal Academy and the IET's work. A lot of those gaps have been managed by us being able to access skills from the European Union. It may be worth distinguishing movement within companies. A lot of companies really rely on being able to move people from place to place. Companies that we all know, E.ON and so on—big investors in the UK—do that. However, it is also to fill from outside, to bring people into companies to fill skills gaps. Engineering needs a really close look to make sure that we can still access all the skilled people that we need, because currently that is an important part of the solution.

Professor Michael Pollitt: I am obviously a member of a global university, and it is certainly the case that we can access skills from across the world in the energy sector. If we cannot get people from the EU, there are lots of people from other countries and, of course, it will be important that energy companies are not restricted in their access to labour from across the world. In terms of where the action is in energy, clearly the most interesting countries in the world continue to be the US, China and perhaps Japan in terms of energy R and D and innovation, and accessing the talent pool there or the research networks there is just as important as accessing the EU.

Q188 **Chris White:** Is that shift already happening?

Professor Michael Pollitt: It is the case that in terms of global R and D, Japan has maintained its energy R and D largely, the US has not fallen as much as the EU has and, of course, China is increasing its energy R and D substantially. In terms of where the new ideas are likely to be coming from, it is those three areas.

Q189 **Chris White:** I might be paraphrasing your response, but are you suggesting that potentially, as the number of EU skills involved in R and D perhaps falls, that will be replaced by Japanese or US skills?

Professor Michael Pollitt: What I am saying is, if we take Brexit as an opportunity to widen where we look for talent, that could be a good thing.

Antony Froggatt: I have two points on that. First, a lot of the R and D and the co-operation is funded by the EU, so my guestimate is that around 400 million a year of research undertaken on energy and transport in the UK is funded by the EU. I guess the Government can choose to take some of the money that is not given to the EU and spend that on UK energy research, but it needs to do that if it wants to maintain the current level, and then it can have the opportunity to choose its partners in other parts of the world.



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The second thing to note is, in terms of Brexit, it is not just about skills; it is about equipment. Will there be additional costs and potentially bureaucratic processes to enable the import of equipment? To give the example of Hinkley, it is said that 40% of the expenditure on equipment is going to be done outside of the UK. Big infrastructure projects like that are multinational, and it is not just skills; it is about equipment as well.

Dr Nina Skorupska: If I can build on all of those comments, I have two extra points. First, the renewable companies and the large utilities do employ significant numbers of EU workers. I am a beneficiary of that free labour movement of working in Germany and the Netherlands and then coming back and bringing that knowledge back to the UK. This is particularly interesting if the investment that is coming into the UK is foreign owned or the technology we are bringing into the UK is imported. That knowledge transfer and the skills of optimising and delivering that are key. Some UK developers have already reported difficulties in hiring foreign expertise due to the concerns about their legal status at this moment in time, and this needs to be put right so we do not see a halt.

Equally, the restriction of our own ability to work in Europe could affect our ability to promote our leading renewable technologies or the smart business models or IT that we want to do. We have to consider what that means and the way that we can work.

My last point, putting my other hat on, is that 17% of workers in renewables are women compared with only 8% in traditional energy; there is a real opportunity there.

Chair: That is interesting—our statistic for the day.

Dr Nina Skorupska: If the Government is clear, they need to tap into those extra skills, growing that excitement to work in the energy sector.

Q190 **Chris White:** That has really helped me with my second question, but first of all to Nick and then to everybody, in your Energy Systems Catapult, how many EU citizens are working there? Do you know the rough figure? Secondly, none of you, apart from Nina obliquely, have mentioned if you see this as an opportunity. Nick, you started off by saying that this has been a challenge in the sector for the last 10 years, but do you see this as an opportunity where your sector could feed into industrial strategy of how we can create home-grown talent?

Nick Winser: The catapults are still at the start-up phase; we have about 100 people. I would be guessing, but it would have 10 or 20 foreign nationals. It is very attractive for people to work in innovation, so we have a real opportunity to pick the best, because people are very inspired by the opportunity to be part of an energy transition that is about something as important as mitigating environmental risks. We are in a slightly blessed place there.



To reflect on Michael's point, in my time at the National Grid I saw people from all over the world—not just the European Union—come in, and as an industry we access all of the markets. There is a real opportunity though in the sense of bringing forward innovation and attracting people into those innovative, new products and services and new companies. We do really need to grasp that.

Q191 Chris White: Are you saying we are going internationally because we cannot grow our own talent?

Nick Winser: We do grow a lot of our own talent. We still have very substantial numbers of engineers and technologists coming through our educational system, but it does not meet what are seen to be the requirements that we have, looking right across the economy, and that has been quite well reported. Up until now, we have continued to want to emphasise, as an engineering profession, that we need to have substantial ability to grow our own, but also we accept that part of the solution is going to be accessing talent from all over the world. That is fine and we just need to make sure we can still do that in key skill areas.

Q192 Chris White: How do you think you are going to attract the other 42% of women to join the profession?

Dr Nina Skorupska: We have a whole programme in WISE called People Like Me, talking to 12 to 13 year-old girls at schools to describe that being an engineer or thinking about a career in a power plant or on the National Grid is not just about building things but about changing us to enjoy a modern life. It is painting pictures of solutions of how they can influence the future that we want. It is a very different story, and WISE has been working on that, and with the support of the Princess Royal we have been making headway on that.

But it is a difficult journey, and the key thing for me is when key decision-making boards, like this Committee or BEIS, set up advisory panels or decision boards, if there are not women present there—and there are some very smart women who can be involved in that—and they are not seen as role models, the same old, same old will appear. I would strongly suggest that we make some key changes in the UK to really live what we want to practise in the future.

Q193 Chris White: Has the University of Cambridge made submissions to the industrial strategy on how to create these skills?

Professor Michael Pollitt: I cannot speak for the whole University of Cambridge but, to your point, Britain's leading universities want to work with other leading universities globally. I was part of a wonderful initiative, which was the Cambridge-MIT initiative, in the early 2000s. As part of that, we had a large number of exchanges with MIT. That was a wonderful experience for all of us involved, and Brexit could be an opportunity to broaden the number of universities that might be eligible for funding projects with UK universities. Certainly, speaking for Cambridge, we would very much welcome the inclusion of top US



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universities and other top universities globally outside of the EU, as well top EU universities.

Chris White: I will finish by saying that nobody on the panel has really identified, apart from Nina with some of her work with WISE, how we can develop our own skills and labour force to really address these challenges.

Q194 **Albert Owen:** If I can move on from skills to an area you touched on, which is research and development, Michael, you mentioned the fact that Japan, the USA and increasingly China were the global leaders. Within Europe and within the European Union, how does the UK fair against our European colleagues? The European Commission has described the UK's R and D intensity in general as stagnant and low compared with EU innovation leaders. We are not doing very well at the moment, and what you are saying, Michael, is you think there might be better opportunities from Brexit if we can get some of the funding as well. Is that your vision of it?

Professor Michael Pollitt: I am an economist, so I do not like to say that we should spend more money necessarily. We should spend our money wisely, and the UK has done some very good things. We have had the Low-Carbon Networks Fund and the Network Innovation Competition.

Q195 **Albert Owen:** Do you accept that we lag behind?

Professor Michael Pollitt: Yes, I accept that we lag behind on the public R and D figure, but of course we have had some really quite innovative targeting of money on more commercial, less public R and D towards energy, which has been very successful and has a lot of public value.

Chair: Where are we in the league table? Are we Chelsea or Tottenham, or are we Middlesbrough or Sunderland?

Albert Owen: Or Everton?

Professor Michael Pollitt: I will get back to you on that.

Q196 **Albert Owen:** I hear what you are saying. If I can move to what Antony said earlier—that the UK Government could replace the scale of funding we could lose—as I understand it, from the figures that we have had, we put about 12% of funding into the Research Council and we get about 15% back, so we are a net beneficiary of the EU. You mentioned figures. I think you said 200 million.

Antony Froggatt: 400 million.

Q197 **Albert Owen:** 400 million—okay. But of course we have received some €2.6 billion from the Horizon Project and we have had the second largest share, so what kind of replacement would the UK have to do for us not to lose out on these large projects? Michael mentioned that we want to be



global leaders with Europe in the future, so are you really confident that the whole supply chain and everything is not going to lose out?

Antony Froggatt: Within the energy sector, it is important to analyse the degree to which the EU assists its development from a financial perspective. Some of that is in terms of loans, some of that is in terms of project development, like the Connecting Europe Facility, and then there is also the R and D. What we need to do is a clear assessment of where that benefits the sector and how that will be replaced, and there are different mechanisms to do that. There are questions, for example, on the European Investment Bank: does the UK wish to try to remain a shareholder within that, and the Chairman of the EIB has suggested that that is worth thinking about.

Q198 **Albert Owen:** Are there non-EU countries that are in that position?

Antony Froggatt: There are, but 90% of funding from the EIB goes to member states; only a small percentage goes elsewhere. If we were to remain a shareholder, presumably the extent to which we continue to get funding would increase. Likewise, in terms of Horizon 2020, there are non-member states that are party to that, so does the UK wish to buy into that and/or do we wish to focus more on other parts of the world? For me the key question is firstly to recognise the extent to which we financially benefit and then the second is how we want to replace them.

Dr Nina Skorupska: I have a few more little statistics, building on the EIB. The UK received 3.6 billion for renewables from the European Investment Bank between 2011 to 2016, and a further 9.9 billion was spent on power projects, which includes transmission and distribution. As you quite rightly pointed out, if you are outside of the union you can have access to that, but I would say it would be a more difficult negotiation to ensure we got that level of funding and support. What has been striking over the time that I have been back in the UK is that the clear and stable policy framework for renewables has delivered extraordinary solutions; we enjoy 25% of our electricity from renewable sources now, and that is because the UK has put its neck out and said, "We are going to do it." That has been in concert and arguing with EU rules, but we have been clear and we have been leaders.

The question we have now is what will replace that. Are the framework and the support mechanisms in place to stimulate that innovation and that drive for new business models—this decentralised energy world that we can enjoy hopefully? What is going to take its place? The industrial strategy that we are looking at has a big act to follow in order to give that certainty and opportunity again, and we want to engage with that as an industry.

Q199 **Albert Owen:** It is interesting you are saying that. You are now saying that we have a fantastic framework and we need to keep it, but you have been quite critical of it in the past as an organisation, saying that there is a lot of uncertainty and we need to look to Europe.



Dr Nina Skorupska: You are right, full-stop.

Albert Owen: I have a good memory.

Dr Nina Skorupska: The framework has been such that it has declared that it wants to deliver 15% renewable energy by 2020—30% in electricity, 12% in heat and 10% in transport—but we have had a seesaw way of delivering that. We have had a little bit of a boom and bust. We know there were 117,000 jobs in renewables last year. We are going to be doing our survey in the next month to find out how many are in there now, and we know that 2016 is going to show that the solar industry took a massive beating. The good thing is, with deployment, costs are coming down and we will see the same for energy storage, so we will see solar and storage take off again, but will the UK Government allow us to change our arcane electricity regulatory support mechanisms to enable us to deliver this new future?

Q200 **Albert Owen:** Coming to Nick now specifically, do you think it is realistic that the UK Government can replace the scale of funding from the EU? That is my main question to you, but obviously if you want to comment on what you have heard, please do.

Nick Winser: As Nina commented, the industrial strategy provides an opportunity, and clearly there are 10 or so pillars being looked at as part of the industrial strategy. I would advocate strongly for the energy pillar being a very good one to look at—a very solid one. We have a backdrop of COP21, where we know that virtually every nation in the world has to go through an energy transition that will have common features with ours. They will not all be the same of course, because of history, but they will be substantially similar, and the new products and services, the skills and techniques of integrating a fast-changing energy system, are going to be saleable all over the world. I would strongly advocate for significant investment from the industrial strategy into the energy sector.

I would also say at the same time there is an opportunity for increased efficiency in spend to the extent that it comes from Government. It feels to me, having come in as chair of the catapult from the National Grid—a big corporate background—like it flows out through many channels. It might be the time to rationalise and prioritise—not necessarily picking winners but being clear about the key areas of the energy system where we should be focusing research and development.

Q201 **Albert Owen:** We all agree with value for money, and specifically you mentioned not picking winners necessarily. But are there specific technologies or areas that require more Government support now and that we can benefit from? You know with the grid you are talking about demand from different places: oil and gas from the north and wind from Denmark. Is there one area, like tidal for instance, where we have been trying for years to move forward?



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Nick Winser: I would say one of the key areas to really invest in is whole-systems analysis—trying to understand what are likely to be the most fertile areas to invest in. One of the problems in the energy system at the moment is that there are so many paths forward. How many electric cars? How many heat pumps? What role might hydrogen have? How much offshore renewables? One of the problems for innovators out there is just not being able to create the business case because there are so many possible routes forward. We should work together across the energy community in the UK, as well as working with other countries, to try to, as much as we can, focus on where we see great optionality or opportunity being introduced, rather than scattering our money perhaps a bit too thinly.

Q202 **Albert Owen:** For the last 15 years, we have talked about low carbon. Could we be a low-carbon hub for the world? Michael, you suggest that Japan and China are running away with this. We do not want to be just importing their kit. We want to do something. Do you think there are opportunities and do you think Brexit can hamper that or assist?

Professor Michael Pollitt: It can assist. We need to play to our strengths. The danger with UK public investment, especially in R and D, is that we try to get on the playing field where other people are already way ahead of us, and we need to think about where it is that we excel, which is clearly in high-quality services and advanced manufacturing. It is not in mass production of wind turbines; it is not going to be in tidal turbines.

Q203 **Albert Owen:** Why not?

Professor Michael Pollitt: Because these are well-established technologies; they have been around for a long time. If I was putting in a small amount of money, which it is in aggregate, my advice would be to put it into things where we are likely to see high returns for the UK, which is going to be in the areas of energy services, business-model innovation and the use of data. One of the things that I keep saying to people in Government is that we need better, publicly available data on the energy system and about how consumers behave. All these data sets are being collected on individual projects and have not been co-ordinated. They have been collected at great cost and we cannot use them. If the UK wants to be a global leader in this sort of area, it needs to create better data that is collected regularly in ongoing surveys, which then people can analyse and build business models around, use machine learning on and we can exploit all the natural advantages that we have in IT and in services. That is where we should look for competitive advantage, and people come to us for those types of services: "How do I run a very sophisticated market? How do I analyse data? What can I do with data?" These are the sorts of things where there are going to be jobs in the future.

Q204 **Albert Owen:** I understand that, but the principle is to keep the lights on and keep our homes warm, and we need energy and we have natural



resources.

Professor Michael Pollitt: But you asked me where I would put our R and D money, and that is where I would put it.

Q205 **Albert Owen:** You would not put it in developing home-grown technologies.

Professor Michael Pollitt: These are home-grown services where we are world leaders.

Dr Nina Skorupska: There are two elements I would like to talk about. One is about what we need to do to support home-grown and deliver for the UK's low-carbon energy future. I do not know if many of the Committee realise that we are the leaders in anaerobic digestion. Germany says it is, but we have now developed lots of newer systems that are linked to providing solutions rather than just a technology, and we are already talking to India and back through to China around how a small-scale AD plant can deliver their concerns and climate change solutions. We need to show that we continue to deliver that: advanced conversion technologies, gasification and pyrolysis.

We have not talked here about the circular economy and the fact that we have waste and resources that we should be using ourselves. We export municipal waste to Sweden who use it all, so why are we not doing this ourselves? The fact is that transport is the leading CO₂ emitter now in the UK. We have done great on power, heat is so-so, but it is transport now. We have a £1 billion-invested bioethanol industry here in the UK; two big leading organisations have been waiting two years to hear from this UK Government about what they think about the renewable transport fuel obligation. The advanced transport technologies, the advanced fuels, could be a place where we could be the lead.

Q206 **Amanda Milling:** During the course of the session so far, we have touched on the potential future UK-EU energy relationship, and there is a variety of models that already exist out there and I do want to touch on those. I know some witnesses have put forward alternatives too. I am not going to be asking you questions about that, so we will come back to that; colleagues are going to explore that. Looking at the UK's relationship with the EU in terms of energy, what should our priorities be?

Nick Winser: I would focus very strongly on the role of ENTSO-E and ENTSG. For complete clarity—I am sure the Committee knows this—these are not lobby groups; these are set up as part of the third package under European directive. Significantly, ENTSO-E has 34 countries in it, so it already includes six non-EU countries, which are signed up as part of the third package, and to do so they have to fit in with the requirements of the third package even though they are not part of the European Union. Those organisations are absolutely critical to this. They have put in place the markets; they have put in place the codes; they put in place system-operation co-operation, and they take a view on long-term system planning. In my short window here, I would say that we



absolutely need to focus on continued membership of those organisations.

Antony Froggatt: I would agree with that. The other thing in terms of looking forward is the other pan-European bodies that come under the EU framework: you have the European Environment Agency; you have Euratom—which I know you have touched upon in other discussions—which are absolutely crucial in terms of what relationship we will or will not have with bodies like that.

Dr Nina Skorupska: Again building on that, in understanding our relationship regarding the EU-ETS, many of you will be aware that our carbon budgets and the way that we describe them and account for them are predicated on EU-ETS and our role in that. We have to be able to account for our own carbon emissions. What will happen beyond leaving Europe? If we then still want to be part of contributing to a European response to the COP 21 and beyond, what will be the European Court of Justice's role in arbitrating the delivery from the UK or if there is any concern about our accountability in playing our part? Also, who will sit over any jurisdictional issues between Northern Ireland and the Republic of Ireland? We have said one of our core principles of Brexit is to withdraw our requirement to come under the European Court of Justice. These are some very fundamental elements that are not specifically about the energy market but have a great influence on how we can go forward.

Professor Michael Pollitt: I agree with everything that has been said. The top priority is obviously to maintain the existing interconnector relationships and to make sure as far as possible that the terms of access to existing gas and electricity interconnectors are not affected. The standout thing that we should try to protect is the European Emissions Trading System. If we are serious about being a global leader on climate and if Europe is similarly serious, we cannot be seen to leave the European Emissions Trading System of our own choice, and we should do everything to stay a member of it. One hopes that the rest of the EU can see the value of that, because if we have a hard exit from that, it could seriously undermine global efforts on climate and certainly will undermine our role in global leadership on climate solutions.

Q207 **Amanda Milling:** Can I explore that a bit further? In terms of our role within the EU to date, do you think other EU member states see value in the role that we play, and when it comes to the negotiations, will they see this as an area where we have added something that they might want to continue with?

Professor Michael Pollitt: Certainly the people I speak to in the EU, in the Commission and around the EU would say that; they would say that we have played a leading role in both the EU-ETS and the promotion of the single market in electricity and gas. Certainly people who are in favour of those things are worried about us leaving. As to what will happen to the rate of progress of those things without us, one cannot



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help but be somewhat pessimistic about that, but I will leave it to others to comment on that.

Antony Froggatt: The UK has, through its domestic legislation, higher emission cuts than the EU average, so if we are to leave, and in some ways it is a negotiating opportunity for us in terms of remaining within the ETS, the other member states will have to increase their national contributions if they are to retain the pledges put forward at Paris. There is a strong argument from a European perspective for us to remain in it.

Q208 **Amanda Milling:** Before we look at some specific models that witnesses have put forward, while we look at this, are there any other things we should learn from other non-EU members in terms of their dealings with the EU, specifically looking at energy?

Antony Froggatt: There are three main models. One is the Norway model, which is part of the EEA; the second is Switzerland, which is probably the most interesting because it is connected, at least in terms of the electricity market, but it is not fully connected in that it does not do intraday trading, so it does not have the most connected market. It is not able to do so, because it does not have an overarching framework and it does not have a dispute mechanism, so it is not allowed to do that. It is an interesting point for the UK: if it wants to have a fully integrated market, as it currently has, it is going to have to have a dispute resolution mechanism. I would say that that is the key lesson for us.

Dr Nina Skorupska: If I may add and build on that, the Swiss model has been allowed to have a favourable interconnector trading agreement because it has 40 interconnections, but it is in the heart of what would be considered the EU family, whereas Ireland and the UK are a bit on the edge. It would be interesting to see how, if we wanted similar favourable interconnector trading agreements, that would be viewed. That is a very big concern for the Irish at this moment in time—how they will be able to have access through to the market, so there are wider considerations here.

We, with our members, have looked at all these different models and the pros and cons, but with all of them in the main is this position for free movement as part of that requirement of those agreements.

Amanda Milling: That is the big sticking point.

Dr Nina Skorupska: How will we negotiate further on that?

Nick Winser: It very much depends on how we turn up to these organisations. My experience at ENTSO-E was that Norway and Switzerland turned up strongly and contributed strongly, brought ideas to the table, took roles in these organisations and the soft influence is to be had here. We are not differentiated in those organisations. There are 34 countries who regard us as completely equal. To take Michael's point, our background, coming right through from being the first in many ways



to introduce wholesale markets in energy, which has become the model across Europe and many parts of the world, is a sign of what strength we bring in terms of market arrangements, regulation, standards and integrating systems. The softer end of this business is big.

Q209 Michelle Thomson: Nina, you have mentioned Northern Ireland a couple of times. A significant concern for me is Scotland as well, particularly in the light of its much higher appetite for development of renewables and the consistent strategy that has been in place for a number of years. What sort of feedback are you getting from your members in terms of their concerns about Scotland being dragged out of the single market against its will?

Dr Nina Skorupska: They have concerns about being dragged out of the single market against their will.

Michelle Thomson: But specifically—

Dr Nina Skorupska: It is about not knowing what will replace it or what the opportunities are, and the UK Government, in this negotiating period, bringing that clarity as quickly as possible. The worry would be a deferral of decisions of projects, because of not knowing about that investor platform and reflecting that. But my colleagues in Scotland are pretty clear that they want to deliver a renewable energy solution, so they are very pro getting on with just doing the decentralised energy market. They are getting in there and providing city solutions or local solutions and, in a way, they are really then concerned about how this then fits more broadly into Europe as a secondary matter.

Q210 Peter Kyle: Professor Pollitt, if I can turn to you, in the submission from the University of Cambridge, it was suggested that we have a system with a common energy security treaty. Could you talk us through that, please?

Professor Michael Pollitt: Of course, you recognise I am an economist, not a lawyer, but what we were getting at there is that it is striking that often when people talk about energy, they do not major on the market; what they major on is energy security, and energy security is the number one policy concern in energy. No matter what people say about prices or about the environment, the thing they care about—and somebody already mentioned it—is keeping the lights on.

Of course all countries in Europe care about that, and what we were suggesting there was that there is an opportunity to reframe our interconnection with Europe, not as being about access to the single market but as about a common energy security that we need to maintain, and there is plenty of precedent for this around the world. We mentioned some of the interconnection between Russia and the Baltic States, where individual cities either side of that border are reliant on common gas storage facilities. Of course they co-operate on swapping gas and they



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do not see it as being about an integrated market; they see it as being fundamentally about energy security.

There is an opportunity there to reframe some of our relations in energy as being about a shared security and potentially to wrap that up in a wider set of security concerns. We might get a faster deal on issues of shared security than we are going to get on issues around the single market.

Q211 Peter Kyle: I am wondering if any other panellists would like to say anything about this idea.

Nick Winser: I would just say briefly that that infrastructure is pretty much in place; in ENTSO-E and ENTSG, they have security operation; they have system operation committees within those organisations, which do annual studies as to whether we think that the overall security of each of those systems for the coming year and five years ahead has some resilience. That is not to say they could not be developed further, but that stuff already goes on.

Antony Froggatt: In some ways turning around the thinking, once the UK has left the EU, will the UK continue to have more influence on a bilateral basis or on a multilateral basis? If we look at a number of countries that are in the neighbourhood of the EU—and we touched on some of them like Norway and Switzerland—some of the eight countries in the Energy Community, which is the Balkans and Ukraine, are gradually moving their system to a more market system. The UK could join with these countries and some of the others in the neighbourhood of Europe to create a more regional approach and regional negotiation with the EU, potentially enlarging the European energy union. Security is one element of it but it is across energy security, market issues and environmental issues.

Q212 Peter Kyle: There were a few ifs in your answer there. Just to stay specifically on the core issue, which is really redefining energy as a security issue rather than a trade issue, do you sense that there is an openness to this through our partners across the European Union?

Antony Froggatt: I do not think we should define it just as a security issue. It is a matter of putting in the context of all of the three: the energy trilemma that people are continuing to talk about. On the opportunities that countries or the continent sees in terms of concerns about energy security—and we see that in terms of Russia and Ukraine—we need more confidence in the energy system such that Ukraine is more willing to pay for its gas because it has an internal system that knows that more customers pay for their gas. It is developing that whole system of market and security together. I would absolutely stress that this is a positive way for the UK to move forward as it is out of the EU.

Q213 Peter Kyle: Thank you—that is really helpful. To step back a bit now, we are coming towards the end of our inquiry into the energy market and



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Brexit. We are going into a set of negotiations as one nation against 27 remaining nations. What leverage does Britain have in comparison to the 27 others, and what do you personally feel are Britain's chances of coming out of this with the kind of deal that we really need to protect our domestic market?

Nick Winser: In terms of energy, our position is quite strong. These are integrated systems that have been built across Europe, and there is a huge amount of infrastructure and processes that are in place. It is just as much in the European Union's interest as ours post-Brexit that we understand that the interconnectors, for example, can trade freely and we can forecast with them which way the market economics are likely to have them trade. That is vital for energy security at both ends of the interconnectors. Overall there is enormous goodwill among the energy companies across Europe as they work in these European institutions, and there are seen to be very large economic rewards for continuing to work together in an integrated way.

Q214 **Peter Kyle:** Antony, I wonder if you could come in afterwards, because we just heard something that is spoken about a lot when you speak to people within the sector. But of course these negotiations are not going to be carried out entirely within a sector; they are going to be linked to a whole set of other negotiations, and emotion will creep its way into them. From your experience of energy but also Chatham House across the board on a whole range of different issues, do you think it is going to be possible to enter into these negotiations focusing 100% on trade, having a logical outcome based on the logical needs of both markets, when clearly when you hear the tone of the debate in our Parliament and in the European Parliament, it is very clear that emotion is going to creep its way in on some level?

Antony Froggatt: Yes. I do not think the European Parliament has really started discussing it yet. One hopes that once Article 50 is triggered we enter into a new stage. For example, at Chatham House we have tried to have discussions with different member states and with different members of the European Commission, and many of them have said, "No, we are not doing that until Article 50 is triggered." It may be that once that occurs we can have more detailed discussions about the individual sectors, what that really means and what the most favourable outcome is, not only from a UK perspective but also from an EU-27 perspective.

In terms of one thing Nick said, it is a continental system but there are also continental and global challenges, and we have talked about climate change but there are other elements in terms of energy security to which a common approach is beneficial. In particular, in relation to climate change, the UK has been a strong leader in this area. That is recognised within the EU, so that it is a strong card for us to play during the negotiations—that us being part of the system is good for everyone.



Dr Nina Skorupska: It is about trust, so not rowing back on our commitments that we have made to date, for instance the renewable energy directive targets for 2020. We have already heard some people claiming in the media, “Oh, let’s abandon any renewable energy targets now. We do not need them, because it is about carbon.” It is about living up to our commitments. On the other hand, in this period of two years, we need to really clearly demonstrate what a successful market and systems can look like here in the UK—that our grid companies will become more flexible to allow us to have the whole-system cost, to show that we still are worth wanting to negotiate with and learn from. That is what I would advocate. The Brexit negotiations should not slow down our other commitments, and that is the worry that we have as members.

Professor Michael Pollitt: We have mentioned the Swiss model. We are right to be pessimistic. The Swiss experience is that it is likely we will be punished, so with Switzerland, as Antony has said, further integration has been stopped, both on the single electricity market and on the EU-ETS. We can expect punishment, but we should be open handed and we should do what Nick is suggesting. We want free trade in energy, we want to remain part of the EU-ETS and we should recognise that our audience is not necessarily just the EU. We want to be demonstrating that we are open for business to the rest of the world, and that we are genuinely maintaining our international commitments and seeking a fair deal from the EU.

Q215 **Peter Kyle:** That answer is incredibly helpful and realistic—not pessimistic but quite realistic for what comes next. To follow up and finish my questioning, David Davis has said on the floor of the House of Commons that, when it comes to the single market and the customs union, the new set of relationships will be, I quote, “Exactly the same,” in terms of the benefits to our country as what went before. I find that quite extraordinary. What you are saying is that what comes next will not be exactly the same; therefore, there will be a change in the relationship between our country and the EU and EU countries with regard to our relationship for energy supply and import and export.

Professor Michael Pollitt: I do not know, but the Swiss experience is not encouraging. We need to look at this on both sides. This is a low-cost punishment option for the EU, because the cost is spread across the EU and in relative terms it is quite small. Of course it may show up as a gradual divergence of our codes and our rules and reduced interconnection investment. Of course, we need to realise that maybe energy is not a priority for us either, and maybe we should not get too worked up about that gradual divergence that we might see, because there are probably many more important sectors to be concerned about.

Q216 **Antoinette Sandbach:** To pick up on that idea of being punished, the Prime Minister talked about maintaining some elements of the single market and some elements of the customs union. If that is not possible and we cannot get a sectoral deal on energy, bearing in mind that your



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evidence today has been that effectively our strength or potential strength may be from energy services, what do you think those WTO and sectoral barriers will be for us if we are “punished”?

Professor Michael Pollitt: There are two differences between us and Switzerland that are important. My lawyer friends tell me that Switzerland might have a case at the WTO for the way it has been treated by the EU on energy, so we could pursue the WTO option if we were punished. The other difference is we have this shared membership of NATO with many other European countries, so we have options that are not available to the Swiss. If there was a serious punishment, we could start taking the EU to the WTO and testing our case there in a way that, for some reason, the Swiss have not been willing to do.

Q217 **Antoinette Sandbach:** If we bring a WTO case, they take an incredibly long time, as I understand it, and what would happen to investment in the energy sector in the UK in the meantime?

Professor Michael Pollitt: What we are envisaging is a slow divergence from business as usual, so in a sense one could imagine taking the case and it being settled when it mattered. It is not altogether clear that we need an immediate settlement at the WTO.

Q218 **Antoinette Sandbach:** Antony, Chatham House have proposed this enlarged European Energy Community. Will that make the UK a rule-taker? Perhaps that is a solution to the punishment option, as it were. Would that make the UK a rule-taker or would we be able to influence the rules if we became part of that enlarged community?

Antony Froggatt: Compared with what we have now, we will always become more of a rule-taker. To take a step back, from an electricity and gas perspective, we are not going to be not trading and exchanging electricity, and in particular electricity is the more important energy vector because it is also needed in terms of balancing the grid. It is not just that we are going to send a certain amount of electricity somewhere, which is what some countries do already; Turkey imports electricity and takes electricity from the EU, as do many countries in the energy community. It is about whether or not we have the systems that are fully integrated and, if we have systems that remain fully integrated, these rules will be set by bodies, some of which we are part of, like ENTSO-E, but some, like the European Commission and the overarching framework, that we will not be part of. Therefore, in the future, we will be taking more policy and setting less. The argument about having a wider energy union is that it increases the likelihood that, as a group of countries, we have more influence than we would in trying to negotiate on our own, as Switzerland does.

Antoinette Sandbach: Nick, do you agree with that?

Nick Winser: I am more optimistic about this. Having witnessed an awful lot of the debates around the rules, as the network codes have been developed, I did not see any distinction being made. Norway and



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Switzerland were at the table; they came to the committees. This is a very complex energy system. This is a technocratic discussion around how to make complex energy systems work together, where everybody pretty much shares an interest in security of supply, economy and hitting the environmental targets. To Michael's point about punishment, I am nervous about access to R and D funds and being integrated into innovation; that seems to me to be a concern. As to how you plan an operate the grid, there should be a huge amount of opportunity to mine that shared interest, and I believe that is going to be terribly important for everybody involved.

Dr Nina Skorupska: We are already seeing the impact of the fear of having to fall back on WTO rules. For one-third of the renewable power we enjoy today, we import biomass, and we anticipate that will impact the cost of that fuel. We also convert to renewable heat by biomass. The tariffs are unlikely to affect oil and gas. They are already going to benefit because they are on a separate agreement at this point. All of a sudden we will see a rebasing of how some renewable technologies can deliver value-for-money electricity if we are not clear. For transport, the biodiesel industry imports used cooking oil from 70 different countries. Import costs are likely to increase as a result of having to work within those agreements. As I mentioned earlier, we are talking about storage being a clear play for us in the future; members are not scaremongering when they are saying that we could see some tariffs increasing, up to 24% on the cost of those wonderful batteries that we want to be able to use.

It is also about free trade agreements that we put in place. Nobody has talked about those agreements undercutting what we already do now, for instance importing very cheap biofuel from the likes of America or Canada because maybe they have lower quality standards than we introduce or different priorities or poorer quality, so we have to look at everything in balance. I am concerned that we automatically think we can default to WTO and everything will be fine on the night. We have to understand what that means, and it could be opportunities, but it is a concern at this time.

Q219 **Antoinette Sandbach:** None of you have really addressed my question around the potential barriers in services that might flow. Does anyone want to comment on that?

Professor Michael Pollitt: The only comment that I have heard is that UK-based energy services firms will have to work around the fact that they will not be able to operate within the EU, which is the case for Switzerland; you cannot be a Swiss-registered energy trader in the single electricity market. Of course, like any financial service, there will have to be some sort of workaround for that, whether it is registering your company in the Netherlands and trading through there, so there will be some increased transaction costs there.

Q220 **Michelle Thomson:** Some of the things we have already touched on, but



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I wanted to pick up on the transition arrangements specifically and get some thoughts about that. Given the potential complexities that we have been dancing around today, is two years long enough, and what areas would you bring out that we must have certainty in and what areas do you think we might need to move aside? I am interested in your general thoughts first of all.

Dr Nina Skorupska: The exit coincides with some very important reviews at European level, like the clean energy package and phase four of the EU-ETS being ratified in 2019, so these need to be borne in mind as to what that means in terms of being able to align and not have immediate divergence when we exit on our energy markets. Maintaining the connections and influencing the EU bodies are very important, as is understanding the waste policy. There is so much work going on, and if we do have complete divorce, we will see the loss of a framework that the UK is working within and seeing that help our industry.

We need to make sure bioenergy standards have to be agreed all the way up to 2030, because that is a big debate going on in Europe, and we have to understand what that means for the UK so that we do not put ourselves in a negative position. We also know our influence is likely to diminish, but I also say if we go to the table right, like Nick explained, we could maintain that, so we have to understand how we go to the table for those transitional arrangements. The RED targets have been a strong driver for the last decade, so I would want to understand and see from the UK Government what we would put in play to help that direction of travel to deliver our solutions for climate change and ensure that the UK is a leader in this. That is my big list.

Michelle Thomson: It is a big list—a lot of worries.

Antony Froggatt: Can I add two other things to the list? It will probably get quite long by the end of the table. The first is budgetary issues. We have talked about the extent to which the EU financially assists the energy sector in the UK. How will we make the decisions about that? If we are leaving in 2019, the UK Government has said that it would continue some of the funding through until 2020 in certain areas, like structural funds, Horizon 2020 etc. That is not very long, so discussions need to take place as to what will happen after that. The other issue is institutional issues.

I mentioned Euratom, but it is really worth stressing, in terms of its roles and responsibilities, not only is it research and development but probably top of the list is safeguards. As we leave the Euratom safeguards agency what will that be replaced with? Will it be purely domestic? Will it be engagement with the International Atomic Energy Agency? Again, that is very short-term timetable for leaving. If there is a transitional arrangement, what is that for Euratom? There is a whole range of different issues around Euratom that need to be considered.



Professor Michael Pollitt: Our status within the European Emissions Trading System is important for our overall carbon policy, so establishing where we are going with that and whether we are likely to remain a member is important. The single electricity market in Ireland is a big issue for us, and I am not just saying this because I am from Belfast. How we treat Ireland is very important, and maintenance of the single electricity market in Ireland and our support for the Irish government is very important there.

Maintaining the situation with respect to current investments in interconnection is important. We want the ones that are under construction to be finished and we do not necessarily want too much interference on ones whose business case has clearly been established already. Nick might have talked about the code review process that is going on—at the moment extensive co-ordination of codes. That process is due to end in about 2019, so we can get a lot of it completed before we leave, which would be a good start.

The other thing that I would add is we need to start thinking strategically about what we are going to do after Brexit with our own energy policy, because there are opportunities, but there are also risks. We need to start analysing what those opportunities are, so that we realise the opportunities and limit the downside risks.

Nick Winser: I would like to just carve the list into two, because it seems to me that there are things that are vital for the operation of the system today. As we go through the transition, they will remain vital. They are access to the market to allow the interconnections to work, staying signed up to the codes, which are the technical rules for how the system works today, and staying signed up to the system operation protocols that allow the grid to be run in real time between the system operators across Europe. That is list one—the now things. List two, all of which are important, contains ETS, network planning, R and D and standards for export products. Those are all important, but they are not today issues, so they in my mind are the second list.

Q221 **Michelle Thomson:** Assuming that the significant challenge can be met around getting some clarity around transitional arrangements, what concerns do you have about divergence during that transition period? You touched on the ECJ earlier and you could imagine some legal cases and so on. I am interested in how divergence might occur and what unintended consequences and implications that might have. We need to make assumptions about time period. I appreciate that.

Antony Froggatt: On the short term in terms of the divergence, it is what happens with the next electricity and gas markets directives that are currently under discussion. As was mentioned, it is moving in a direction about flexibility, key issues around capacity markets and bringing in from other countries, which the UK has already signed up to, but we will have to see what the EU regulation actually puts in place. In some ways, we may well see in the next year the framework for the



future energy market legislation. That may be the biggest area of future divergence.

Dr Nina Skorupska: I would agree as well—and all the additional work on energy efficiency and the built environment, with the focus of future infrastructural roll-out expectations in Europe and here in the UK. An illustration is in 2019 zero-carbon homes are supposed to be brought into law here in the UK. Will we do that or not? What will be the UK's response to that, linked to the fact that we want to build so many new homes? Those are the kinds of things, other than the interconnectors and the energy market rules, that also then influence how people see how we deliver our future energy systems. Are we being serious across the board in having a joined-up, strategic approach?

Q222 **Michelle Thomson:** Do you have concerns about the general appetite for renewables then?

Dr Nina Skorupska: We are just starting on the industrial strategy. I am really pleased to be engaged in that process. We have a holding position at the moment, so we need to see some evidence that there is a willing and an able. The industry that I represent will deliver, and we will rise to all those kinds of challenges, but we just need to see that framework—not absolute detail but a framework, because we can fit that gap.

Q223 **Michelle Thomson:** You touched earlier on WTO and assumptions. I would like to hear from the other people on the panel as well. I think you, Nina, indicated some concerns about the detail when you start to look at schedules and so on of the WTO, which people are not really talking about sufficiently at the moment. What happens if we leave before we have the specifics of the WTO sorted out? Is that a consideration that you have an anxiety about? Have you got a view about it?

Dr Nina Skorupska: I have shared my views there. It is around understanding what those tariffs are now. It is not just about agreeing individually with every single country's trade arrangements. It is about the—I am trying to find the right phrase that my colleagues have helped me with—preferred relationship status. If you do a deal with one country that you think is of value because you are seeing that benefit from the things that you trade with that country, you are then required to offer that same trade deal to other countries too. I am no expert on this, but I have some members who really are hot on this, so maybe we can supply some further information to you around that concern.

Q224 **Michelle Thomson:** Okay. My last wee question then, just to mop up, is how confident are all of you—it is a very diverse range of areas you have brought out—that your voices are currently being heard and that the level of scrutiny, because some of this stuff is deep depth and we are just scraping the surface, will be picked up on? Are your voices being heard at UK Government level?



Dr Nina Skorupska: We are here.

Antony Froggatt: We are here—yes. In terms of Chatham House, we have had lots of discussions with Government on this issue. It is important to recognise that it is not just the UK opinion that matters. Over the next 18 months there is a real need for discussions to take place within the EU 27. If you go to Brussels and you discuss energy and climate issues, Brexit is not number one. It may be in the top five, but if you go to Poland it is not going to be in the top 10.

There is a real need for the UK as a whole to discuss with the different constituents and the different member states what our concerns are. As we have mentioned, energy is not going to be the number one priority among the negotiations, yet it is important to the sector and the future relationship is important and it can significantly affect the direction in which the UK's energy sector goes—and, as has been mentioned, also Ireland's. It should not be lost within the negotiations. Therefore, it is a real need for us as people interested in energy to have those discussions on the continent.

Q225 **Michelle Thomson:** Professor Pollitt, you laughed. I have to just come back to you and give you a chance to—

Professor Michael Pollitt: It is nice to think that Government listen to academics sometimes.

Chair: Experts.

Professor Michael Pollitt: Yes. I come back to the idea that the issue of our integration into the single electricity and gas market is a second order issue when it comes to our energy policy. Most of the mistakes that we made on energy policy have been entirely domestic in their orientation. They might have been excused with reference to the EU, but they are our own mistakes. What we at the EPRG keep saying to Government is, "Come on—focus on the material policy issues that are under our control; those are the things that we should really worry about."

With all the things we have talked about, we are going to be open-handed with the EU in terms of our negotiation, but this is about our own energy policy. That is what really matters for delivering our own targets and for keeping our own costs down. We are only going to see slow divergence with the rest of the EU relative to the mistakes that we could make in our own policy choices domestically.

Michelle Thomson: We should always look on the bright side.

Dr Nina Skorupska: You asked if we are being heard. I did laugh, but I must refrain that little laugh, because we do work with our colleagues in the department. They recognise that the REA pull together our pan-technology working group—



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Q226 **Chair:** Sorry, Nina. Which department?

Dr Nina Skorupska: BEIS.

Q227 **Chair:** What about BRExU or whatever it is called—DExEU?

Dr Nina Skorupska: We do not work directly with DExEU, but with BEIS and then through them we have built some connections, have we not, Mark? In fact, they have been to some of our member events and shared where we are on the journey, which was very interesting, because there was not that much to be said at that time still. We hope that that depth of conversation will continue and that we are invited to the table. We also work with the other renewable trade bodies and with Energy UK, so we do want to create that joined-up voice.

Chair: Thank you. That has been very comprehensive session. You have given us a lot of food for thought and it has reflected the complexity of the issue. Thank you for your time. We appreciate it. Thank you, colleagues.