HOUSE OF COMMONS

Northern Ireland Affairs

Oral evidence: The Electricity Sector in Northern Ireland, HC 51

Wednesday 6 July 2016

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Watch the meeting

Members present: Mr Laurence Robertson (Chair); Oliver Colvile; Lady Hermon; Danny Kinahan; Jack Lopresti; Dr Alasdair McDonnell; Nigel Mills; Gavin Robinson

Questions 236-280

Witnesses

Carla Tully, President, AES UK & Ireland, and Paddy Hayes, Executive Director, Generation and Wholesale Markets, ESB

Written evidence from witnesses:

- AES UK & Ireland
- ESB

Examination of witnesses

Carla Tully, President, AES UK & Ireland, and Paddy Hayes, Executive Director, Generation and Wholesale Markets, ESB

Q236 **Chair:** Thank you very much for joining us. As you know, we are looking particularly at the electricity market in Northern Ireland and probably power more generally. It is good that you can join us. I understand you want to make brief opening statements, and that is fine. In doing so, perhaps you could just tell us a little bit about your company and what it actually does, because energy is not the simplest sector to look at. I am sure that will be very useful to us. Thank you.

Carla Tully: Thank you so much for having me today. My name is Carla Tully. I am president of AES UK and Ireland, and I wanted to just give a little bit of context for who we are, as not everyone might know. AES is a Fortune Global 200 company based in Arlington, Virginia, in

America. We are a bit over 30 years old, and we operate across the electricity sector in 17 different countries.

We first entered the global stage on electricity in 1992, with the acquisition of Kilroot. We have been in Northern Ireland for 24 years, and we own the Kilroot power station, which is coal-fired. We own the Ballylumford power station, which is gas-fired. Most recently we have invested in 10 megawatts of energy storage, which we have put in the Kilroot coal power station.

We have been spending a significant amount of time on environmental upgrades to bring our plants into compliance and to promote energy storage as a critical technology for the future of the electricity system across the UK and Ireland. We remain committed to this market and continuing to serve the security-of-supply needs of Northern Irish consumers.

Paddy Hayes: Good morning. My name is Paddy Hayes, from ESB. At ESB we have businesses that generate and supply electricity in Northern Ireland and the Republic of Ireland. We also have businesses that distribute and transmit electricity in Northern Ireland and the Republic of Ireland. We also have generation businesses in Great Britain. My own role is the director of generation and wholesale. My responsibility is for developing new generation businesses, operating them and trading at the wholesale level. As I say, we have transmission and distribution businesses in both Northern Ireland and the Republic of Ireland. Those are operated entirely separately and independently from the business I am responsible for. I will not be in a position to comment on those.

In Northern Ireland, overall ESB employs just over 1,000 people. Regarding the generation business in Northern Ireland, we started in about the late 1990s, developing a combined cycle gas turbine plant at Coolkeeragh, which came into operation in 2005. That has a capacity of about 450 megawatts. Since then we have invested in four wind farms, with a total capacity of 75 megawatts, in Northern Ireland. We are investing in two more that are under construction.

Q237 **Chair:** Thank you. My apologies; I should have declared a registered interest at the beginning. I am a paid consultant of Veolia, who do operate in Northern Ireland. I should have made that clear at the beginning. Thank you very much. Generally, what are the main challenges to the electricity supply industry, particular in Northern Ireland?

Carla Tully: It is a good question. Globally, we see that the electricity sector is changing rapidly. For many people who have been part of this business, it stayed the same for years and years, defined by central generation, transmission and distribution systems that go in just one direction, and consumers at the other end with not much engagement in how they are consuming their electricity. We see a global transformation in terms of the supplies of generation and where that generation is

located. In some cases, it is still centralised, but in many cases you are also beginning to see distributed generation, which is changing the way that electricity is generated.

The plants we operate are thermal base-load dispatchable plants, whereas you have the wind and solar coming in. You have an entirely new type of energy coming into the system that is not dispatchable. This presents opportunities and challenges to the way that the grid is operated. The network side is having to become bi-directional, whereby the flows of electrons across that network are having to go in two different directions, which it was not initially set up to do. You also see on the consumer side that, as we look at this trilemma of security of supply, affordability and sustainability, the customers are at the centre of that. They are taking a more profound role in how they are engaging in their electricity consumption and how they are looking at their own generation of electricity, and so that sector is all transforming.

What that means for all of us, as we look at issues of policy, regulation and investment, is that we need to ensure that what we are doing is future-proofed. We recognise the direction of travel and where we are heading, but we do not know the exact form it will take and how fast it will get there. As we make investments and as we formulate policy, we want to be comprehensive in looking at the future state and the trilemma together, and ensuring that the investment is fit for purpose for that new state of the world.

Paddy Hayes: We see the challenges as those issues about sustainability, security of supply and cost, but particularly now we are in an environment that is changing very quickly. The technologies that are available to electricity generation in particular and electricity storage are developing very quickly. The way in which customers use electricity is changing, and the environmental legislation and framework within which we are working is changing.

Because those things are changing so quickly, it is a real challenge for the electricity system and sector, which typically has required assets to be laid down for a long time. We typically expect the assets and generation plants that we build to be in operation for many years, and against an environment of demand, use and technology change that is innovating and evolving so rapidly, that is quite a challenge. It has never been easy to see the future, but it is almost becoming more difficult to see the future. As that environment changes, the framework within which sustainability, the cost of production and the security of supply are balanced is the biggest challenge.

Q238 **Lady Hermon:** It is delightful to see you here. Thank you very much indeed. It is early on a Wednesday morning, but it is very good of you to come. You have described the plants that you or your companies own. Can you just tell us in a little more detail how many people you employ in Northern Ireland?

Carla Tully: Absolutely. We run our two individual plants as a single business and we employ 260 people with an additional 170 long-term contractors on site each day. That brings it up to about 450 people each day.

Paddy Hayes: ESB's transmission and distribution business in Northern Ireland employs more than 1,000 people. Our generation business employs between 50 and 60 people. We have 39 full-time employees in Coolkeeragh, and obviously quite a lot of supporting business. We reckon around £14 million a year goes into the provision of services from the surrounding areas of Coolkeeragh. Then we have about 10 to 15 people working on wind farms, and then in construction we would have varying amounts at different times. Regarding full-time employees, however, we have about 50 or 60.

Q239 **Lady Hermon:** That puts it into perspective. Thank you. Do either of your companies have plans to increase and expand your electricity generating capacity? You must have; you mentioned more wind farms.

Paddy Hayes: We currently have 75 megawatts of wind over four wind farms in Northern Ireland, and we are in the process of building two more. That will take our capacity to over 100 megawatts.

Q240 **Lady Hermon:** Are you able to say where those two wind farms will be?

Paddy Hayes: Yes, they are in Crockdun and Eglish. I would have to come back to you on the exact geography.

Q241 **Lady Hermon:** That is all right. That is an increase in wind capacity. Is it that?

Paddy Hayes: It is. I suppose I should have maybe mentioned in the opening statement that we also have a joint venture with a company called Kingspan, and that joint venture is putting solar panels on the roofs of industrial and commercial customers throughout Northern Ireland. We have 11 or 12 of those projects up and running at the moment, with a total capacity of just over a megawatt. We would be planning to do a lot more of that.

We have been investing in Northern Ireland since the late 1990s. We would be very interested in making further investments in Northern Ireland if the commercial conditions are right. We are still looking for wind farm sites. We are still exploring the potential for additional solar power.

Q242 **Lady Hermon:** Has the decision by the majority of voters in the United Kingdom to exit the European Union impacted on your decisions to invest?

Paddy Hayes: No, it has not made any difference to our decisions to invest and stay in either Northern Ireland or Great Britain. Maybe I should have mentioned that ESB has investments in Great Britain. We are currently commissioning an 800 megawatt combined cycle gas plant

in Carrington, near Manchester. We are in the middle of building a 40-megawatt waste wood to energy plant in Tilbury, not far away from here. We believe that electricity is still going to be needed into the future, despite Brexit.

Carla Tully: I will start with the first part of your question regarding growth plans. The investment that we made last year in the 10 megawatts of energy storage was specifically designed to help open the market for energy storage, which we see as a very critical ingredient to the electricity system. In the near term, we will be using that 10-megawatt project to help inform the new regulatory structure and market structures to ensure that we can get up to that scale and deployment. We have plans for 100 megawatts of energy storage that we would place at the Kilroot site, and then it is our intention to be able to bring more energy storage across the island and in other parts of GB as well as other parts of Northern Ireland. That is on the energy storage side.

Last year we made investments in the environmental upgrade of our plants at Ballylumford and Kilroot. Depending on how you look at it, both of those investments were in fact investments in additional megawatts, because in the absence of them, critical amounts of generation would have been removed from the system. We took that step last year, and as we look forward, we look at continued investments along those lines: either continued environmental upgrades for compliance with the industrial emissions directive, or replacement of that generation with new lower carbon technologies to meet those same security-of-supply needs.

Q243 **Lady Hermon:** I did take down a little note when you were speaking about the environmental upgrades. I wrote in the margin beside it. Were these as a result of the UK's membership of the EU? Are you now optimistic that, when the UK leaves the EU, you can continue to invest and you will not be shackled by more and more directives and regulations?

Carla Tully: Yes. The predominant environmental regulation that has driven the investment that we are seeing now is the industrial emissions directive. That came through the EU and was ratified by the UK. I will not be able to see into the future of any choices that policymakers make, but, at this point in time, that is UK law and so we are bound as of 1 January this year to comply with it. Any incremental investments we would be making in our mind at this point would be for further compliance with that regulation. However, we will leave it to policymakers as they grapple with the exit from the EU and whether or how any changes to environmental regulations would be coming through. We would do our own scenario analysis around that and ensure that we have plans for various potential outcomes. Again, that is so we can continue to deliver on that security of supply.

Q244 **Lady Hermon:** Finally, we have taken evidence in other sessions that there is an anticipated shortfall looming in electricity supply in 2020, which is the issue consumers are very concerned about—as well as cost.

Regarding the evidence that has been given to the Committee, there seems to be some discrepancy between both of your organisations. Mr Hayes, in your written evidence I think you suggested that this anticipated shortfall is overly pessimistic.

Paddy Hayes: Yes.

Q245 **Lady Hermon:** Would you like to elaborate as to why you think it is overly pessimistic? Then I will come to Ms Tully.

Paddy Hayes: Yes. Forecasts in relation to the security of supply are very dependent on the assumptions that are made. As we have looked at it, there are a couple of assumptions that we made that are probably critical. First of all, regarding the target for the north-south interconnector, it does not matter what your view is: it is absolutely essential that the north-south interconnector is built and that everybody puts their shoulders to the wheel in relation to that. However, if the north-south interconnector target is for 2019, even if it is delayed somewhat, we see it has the capability for fundamentally changing security of supply at a macro level for Northern Ireland.

Northern Ireland is already interconnected by an existing north-south interconnector and by the Moyle interconnector between Great Britain and Northern Ireland. The extent to which the capacity of those interconnectors has been factored into security of supply forecasts we think has been relatively conservative. If you were planning the grid, you might like the grid to be conservative about that, but we think those assumptions have been conservative.

The other assumption that we have made is that the existing generation in Northern Ireland is going to continue to be in operation through the period before and immediately after the north-south interconnector comes into play. I suppose that is a big assumption. It assumes that those businesses are going to continue to be commercial, and that is our assumption, but that is going to be a challenge. We have considered that at a macro level the security of supply is okay. The question then remains whether there are transmission constraints that mean that capacity has to be provided for in certain localised areas specifically.

Overall, we think the assumptions around existing interconnection are conservative. We are optimistic that the north-south connector will get built, because it has to. The biggest assumption of all is that the existing generators in Northern Ireland will continue to be able to operate out to 2019 and beyond.

Lady Hermon: That was a very good phrase to sum up your assumption: the north-south interconnector will be built, because it has to be.

Paddy Hayes: The north-south interconnector has to be built, but also the existing generation in Northern Ireland has to continue.

Carla Tully: We have done a lot of looking at the security of supply, in large part because we are a very big part of it. The starting point is the generation capacity statement that is issued by the system operator, so EirGrid and SONI combined. The one that came out for 2016 was a step change compared with how we had seen things in the past. We would also have said that security of supply was an issue, a very keen focus, even in the preceding years. As we look at this one, we see that Northern Ireland goes into deficit in 2021.

There are a couple of different causes of that. The first is that we have a different demand profile that is beginning to come into the island. This is coming from data centres based down in the south, and so the demand assumptions that are coming in are based on chunky, large, base-load consumption of electricity. There is a range of scenarios around this, but the base generation capacity statement incorporates this new view on demand, which is less based on GDP, economic growth, and more based on the specific investments.

The second piece that we see is the overlay of the environmental regulations. What is assumed in the generation capacity statement today is that Kilroot will operate at 1,500 hours. This is an assumption that no incremental environmental investments are made and that Kilroot falls under the level of the industrial emissions directive. From a commercial standpoint, that is not viable, and so in terms of the assumption that comes from a technical standpoint, appropriately, in the generation capacity statement, we would not have a line of sight to see how that would be commercially possible. We can talk about some of the alternative ways of using Kilroot.

We also see that, with the north-south interconnector, the current plan is Q4 2019. We have no knowledge to suggest that that should or should not be the case, only that that is the plan that is in place. Similar to what Paddy has said, we think the north-south interconnector is absolutely critical to the system. It makes imminent sense to further combine the financial grid and the physical grid more completely. It will reduce constraint costs, improve the environment overall and the efficiency of the grid, and it is certainly our expectation and hope that that will happen.

As Paddy said, that addresses things on a macro security-of-supply level. It does not address things on a more localised level. Whether you are looking at the load centres of Cork, Dublin or Belfast, you do care quite deeply where generation and energy services are located. If you were taking it to the extreme, to remove all generation from Northern Ireland and have all of it coming in at a macro level from the Republic of Ireland, you would be unable to support your load centres in Northern Ireland. Taken the other way, if you lost 1,000 megawatts in Dublin, you would face a similar set of issues. The system's stability, the capacity and the security of supply that is required around those load centres would not sufficiently be met.

Since we have to take some decisions around the investments that we will be making and how we help to ensure that security of supply is met, we have taken a more detailed look at that more localised element of security of supply. We have also looked at the change in trajectory over the longer term. For a long-term investor, any type of generator-investor, from now until 2020 has come and gone. We need to look at the post-2020 period, so 2020 to 2025 of that generation capacity statement. We see in this new statement a market step change: a step down in the amount of overall capacity that we are going to see in the system. That means as you look at 2025, you see much thinner generation capacity margins than you would have expected in previous years. That is a very new understanding and a new evolution of how the market is evolving.

Even on the macros, if you extend them out a bit of time into what is our investment horizon, we see that additional generation on an all-island basis starts to become more relevant as well. If we look at the near term—and the near term for us begins in 2020—there is a significant security-of-supply issue for Northern Ireland. Then if we look at a slightly longer term period, we see that additional generation, beyond what we have today, will be needed in that 2025-plus period.

Lady Hermon: Thank you, that was very detailed advice. I do appreciate that. Thank you so much.

Q246 **Dr McDonnell:** I will just pick up on the point you made about security of supply. You are suggesting, on the evidence that we have got from you, that there is a security-of-supply issue; AES perceives that. Yet, ESB perhaps suggests that the projections are a little bit pessimistic. Between you, can you tease that out a bit as to what the upside is and what the downside is?

Paddy Hayes: There are two main questions. First, in our assumption we have assumed that the existing generators in Northern Ireland will continue generating out beyond 2021 and 2022, and for that assumption to be true at a commercial level, those generators have to be making a return on their capital employed. We have taken that as our assumption—that in order for there not to be a security-of-supply issue in Northern Ireland, those generators have to continue in business. Almost by definition there is going to have to be a commercial solution that allows them to continue in operation.

Q247 **Dr McDonnell:** Are you saying that that assumption is perhaps soft? Are you saying perhaps that might not happen and you might not be able to generate to 2022?

Paddy Hayes: There is currently a challenge into the long term around generator profitability and viability. For example, for our business in Coolkeeragh, when we looked at our accounts at the end of last year we took a write-down on our business as we looked forward at the revenue streams coming into the business. We took a write-down in our

accounts. There is a challenge for long-term profitability for the existing generation.

Q248 **Dr McDonnell:** Thank you. Are there any plans, on either of your parts, to increase significantly generation? For instance, at Kilroot, from my memory, you have space to put in another generator. Is there a case to be made for going out and getting a new gas-fired generator in there, or are you telling us that there is not the commercial confidence to do that?

Carla Tully: We do our analysis from two standpoints. We start with the technical side, which is the analysis we have done around security of supply and what we see as the local security of supply as well as the macro security of supply needs—how much generation is needed. At the end of the day, that will be a decision that the system operator will need to take, and the market will need to be able to send the right entrance signals in order to catalyse that investment.

That brings us to the second point, which is that we then need to look at the commercial viability of any investment. We are in not only a transition period in how electricity systems are structured but a transition position in terms of the market structure. We are moving from the single electricity market to the integrated single electricity market, and with that we will have a new structure for how the generation is compensated.

There are a lot of decisions still to be taken. We have the various revenue forms where the rules are being structured. Those rules have not yet been determined, which affects our ability to forecast what energy prices might be under the new structure, how capacity will be remunerated on a competitive basis—who will win, who will lose—and how ancillary services and system services will be compensated. All of those pieces are still in a moment of uncertainty. We are working collectively with other market participants, regulators and policymakers to help ensure that that market is something that will in fact justify the commercial case needed to bring those megawatts in place, so that we can meet the technical requirements.

It ends up being a need that starts with a long-term policy, so right now the strategic energy framework takes us only to 2020. Part of what we need is that look forward to ensure that any investment we are making is to deliver on the policy objectives of Northern Ireland. We are looking for that long-term policy. We are looking for a market design under the integrated single electricity market that delivers on those policy objectives, and then it will be up to us to compete within that market to deliver on those energy needs for Northern Ireland.

Q249 **Dr McDonnell:** With all that, do you see no prospect of extra generation at Kilroot? You did say that your current generation was 1,500 hours.

Carla Tully: No. Under the industrial emissions directive beginning in June 2020, unless we do any incremental investment in Kilroot, we would need to pull it down to 1,500 hours to become compliant. Let me lay out

some of the options around Kilroot. The first option is that the market does not formulate in a way that justifies any incremental investment. Kilroot would then have to comply only with the industrial emissions directive with the state that it is in today, which is very solid operations, with recent improvement in emissions, but it would be insufficient to meet those environmental requirements. By those regulations, we would need to bring it down to 1,500 running hours per year, and based on the analysis that we have done thus far of the current and anticipated market, it would not provide a commercial case to continue running. That is the first option.

The second option is that the market does create the appropriate structures so that we can make an incremental, environmental investment to further bring down the emissions and bring us into full IED compliance, and then we would be able to operate for a few years beyond that period of time. The expectation from the environmental regulations, as they are drafted today, would be 2023. The third option, and this may be in combination with the second option, is that we redevelop from those sites and build new lower carbon technology either at Kilroot and/or Ballylumford. We are assessing all of those options to be able to bring in long-term generation, again to continue to serve that market.

All of these options will be assessed and created in parallel, and ultimately decisions will be taken based on the policy and market structures that are put in place. I am optimistic that we will have the policy and the market structures that we need to deliver the technical solutions and to be able to compete in that market.

Q250 **Dr McDonnell:** Could we pursue the interconnection a little bit further? If we do not get the north-south interconnector at Monaghan, Tyrone or Armagh—wherever it is—when do we start running into trouble? Both of you say we need it, so if that does not happen quickly enough, when do we start running into trouble? If I put it another way, what is the dependence on flow on either side?

Paddy Hayes: Without looking exactly at the numbers, it seems to me that in about the winter of 2021, absent the north-south interconnector and absent anything else, there is a challenge. What would happen then if the north-south interconnector was not going to happen by 2021? Maybe two years in advance of that it would be important to commission some emergency generation or some alternatives—to bring some generation out of retirement, if that was possible, or commission emergency generation that could be brought in within the space of a year or 18 months, subject to planning. This has been done in various jurisdictions and various times. That would be necessary to support the system until the north-south interconnector was up and running.

If the north-south interconnector looked like it was going to be even further away, that might require a more extensive remedy. But it would seem to me that the winter of 2021 is the target, and scrolling back from

that, the time to be enacting some emergency measures would be a couple of years ahead of that.

Carla Tully: We maybe have a bit more of a nuanced view. When we look at the north-south interconnector, we see that from a financial standpoint for the island it makes a lot of sense. Right now we have an integrated financial market. The physical interconnections do not match that financial market. The more that we can do collectively to link the market completely from a physical and financial standpoint, the more we can realise the economies of scale that come from being part of that larger market.

As we look at it, it contributes to security of supply. It contributes to the financial resilience of the market overall and the physical resilience of the market. Those are all inherently good things. It addresses security of supply but it does not solve security of supply in and of itself. As we see Northern Ireland dipping into negative generation adequacy in 2021, there is a local security-of-supply element to that beyond the role the north-south interconnector will play. Whilst it will provide additional resilience and improve the system overall, it will not address all of the local security-of-supply issues.

We have recently seen coming out of the SEM Committee, as part of the I-SEM process, that a new consultation will be issued on local security of supply to ensure that those elements of security of supply are attended to appropriately through the market. We would hope to see, whether the north-south interconnector is on time, delayed or delayed more, the policy and market structures create the needed entrance signals so that investors can build new plant, keep plant running and incrementally invest in existing plant through the market structures on a basis that is financeable, so that we can keep all of those going. That is really the way that we are seeing the role of the north-south interconnector.

Q251 **Danny Kinahan:** Thank you very much, Carla and Paddy, for coming today. One of our inquiry aims is to try to identify the steps that are required, and you have gone through them in detail, and try to get them to actually happen. Is there a conference that is calling together all parts of the United Kingdom? Is there something that is pulling together I-SEM, Europe and looking at the long term, so we can sit down and get the actions required? Is there a mechanism that is happening or is that something we should be pushing for?

Carla Tully: The things that we are aware of and focused on start with the Programme for Government. The way that the NI Executive is structured today is with an outcome-based Programme for Government that is under consultation. We would like to see in it a specific outcome of delivering a secure, affordable and sustainable electricity system for Northern Ireland. That will help to ensure that the resources and the focus are provided to address these challenges and pursue these opportunities throughout this coming five-year period. We consider that to be the first critical step.

The second critical step is the strategic energy framework and, again, that focus on holistically looking at the trilemma and formulating energy policy that will deliver on it. The third piece of that is its linkage into the economic strategy. Energy policy is both a sector within the economy and an enabler of economic growth and development. Having that linkage is very critical to make sure, again, that we are dealing with this on a holistic basis.

The last piece that is in the hands of regulators and policymakers is around the I-SEM development. Ensuring that the I-SEM is developed on time, in the form that is required and that it provides what we need collectively to deliver on that policy is absolutely critical. We want to make sure that we see out of it, again, entrance signals that can be acted on. You can invest based on the entrance signals provided by the market. In addition, we want to see exit signals that are deliberate and actionable. If an exit signal is sent, we must be confident that, through that market structure, that exit can be tolerated.

We then need to ensure that the market participants are all resilient, because the functioning and resilience of the market is simply the summation of those market participants. Where you have any weakness there, you will have weakness in your system overall. You will have less security of supply. You will have higher cost; you will have less sustainability overall.

The last piece of it comes down to people like Paddy and me and companies like ours, which will then have to get busy competing within that set of policy objectives and set of market rules, and delivering the highest quality service and product that we can at the lowest possible price.

Q252 **Danny Kinahan:** It gets more complicated the more you go into it. What is in place to sit down and talk to you both about what steps need to go into that Programme for Government? Have you sat down with the Northern Ireland Executive? Are we working this side of the water with the various bodies that we need to sit down with to put everything in place? Is that happening?

Carla Tully: I do not have full visibility into how all of the different pieces are working. The NI Executive has new Ministers recently in place. The Programme for Government is under consultation as we speak. I believe it is due at the end of this month—22 July. Our perception is that we are at the earlier stages, as each of the departments begins to formulate their plans and as the Programme for Government is taking hold. It is through that processes that these conversations are beginning and will then take hold.

Q253 **Danny Kinahan:** Just "beginning"—it is quite frightening. There is a long way to go on it. The other end of all of this is trying to get the prices down. Given all of the things you have said have got to be put in place, do you get financial help in anything you are doing in, say,

Ballylumford or Kilroot? Are the profit levels tightly controlled?

Carla Tully: The starting point for understanding cost in Northern Ireland electricity is a bit of an understanding of the way the customer bills are composed. There is a component on the wholesale energy prices and on capacity and system services. There are also the charges for the network—distribution and transmission. Then there are the retail charges. All of those come together, with the addition of policy cost, to formulate the final bill for end consumers. Those consumer bills, from a tariff standpoint or from a competitive standpoint, are based on different rates depending on the customer class. Their final bill ends up being how much they consume. When you look at the levers that can be pulled to be able to look at the final cost to the various types of consumers, we look at all of those different pieces.

I had the honour of sitting on the Ministerial Energy and Manufacturing Advisory Group and so we looked quite deeply into these issues. When we look at the generator side, the energy side, generators bid into the wholesale market, the single electricity market, based on a strict bidding code of practice. The prices that come through that are based on the efficiency of the individual units. They are based on the underlying commodity prices. Coal, gas and carbon will end up being the drivers of those, as well as supply and demand. On the capacity side, that is a regulated tariff that is availability based. The ancillary services, the system services, are also a tariff approved by the regulator that is availability based. Those end up being the generator components of that cost.

If we are looking at opportunities for addressing the costs that consumers pay on bills, again we want to take a very holistic look. The first piece is a bit of an understanding as well of what the characteristics are that we are starting with. Northern Ireland is a small population base that is geographically dispersed, albeit on a relatively small geography, on an island with limited interconnection. We import 98% of our fuel that is used for generation. Wind has helped to create some resilience on that and bring down wholesale prices. We have no large-scale hydros or nuclear that, if you look at other countries within the EU, help to keep prices lower. We have network costs that need to go across that smaller population base. We start where we start. These are the characteristics.

When we look at creating the electricity system we are going to operate in in the future, part of what we look at is how we make that more efficient. The north-south interconnector will help to reduce constraint costs. That will help to improve the overall running of the system. Deploying energy storage is another great opportunity to be able to reduce constraint costs and improve the overall utilisation and efficiency of the investments that have already been made. When we look at the 100 megawatts that we are planning to build, we had a third party do an assessment of the value that would bring. It would save £8.5 million a year and 123,000 tonnes of carbon by reducing curtailment, better

utilisation of land, better utilisation of thermal assets and better utilisation of the system overall.

We have a lot of those types of opportunities to address the cost basis, and then the onus within our own business—and we encourage other businesses to do this—is to spend time on the quantity side. That is, how much energy you are consuming and what investments you can make to reduce your bills on your own and through your own investments, in some cases with support from organisations like Invest NI, so that you are able to then reduce and improve the overall profile of how you consume your energy.

Q254 **Danny Kinahan:** Have you had much help from Invest NI in the past?

Carla Tully: We have not looked at that support, but from my engagement with EMAG and the presentations that Invest NI did, we have recently connected with them as we have increased our energy efficiency investment. We did all of what we think of as the low-hanging fruit—all of the easy investments that we could justify on their basis alone. As we want to continue to improve, we will look to Invest NI to see if they can help pave that way, but we have not done so yet.

Paddy Hayes: In relation to end prices, Carla has set out very clearly the components that make that up, and the wholesale generation component of end-user cost is about 40%. That component—the energy part of what Carla described—is in the current market almost directly correlated with the price of gas and carbon. Because of the way in which the single electricity market is dispatched, all consumers in that market get the benefit of the most efficient plans that are dispatched.

If that algorithm was being sold to Northern Ireland as a unitary system on its own, with the generation demand in Northern Ireland, the price at which that marginal megawatt would be generated in the summer time would be roughly £5 or £6 higher than the marginal price in the single electricity market at the moment. It would probably be quite significantly higher in the winter time, when demand is ever higher. I am not sure about the exact numbers, but at a demand of roughly eight or nine terawatt hours a year, at the wholesale level that is a net benefit of being in the single electricity market of the order of 40 million upwards. Then, if we can do work on constraints with things like storage to smooth out demand, it gives us an opportunity to reduce the constraint costs and improve utilisation further.

Going back to your previous question, it is complex, and there are a number of actors in the process. When we are talking about security of supply, clearly SONI and the people who planned the system are probably better placed to be very specific about the technical details behind that. However, collectively, when SONI, the regulators and the Government are looking at trying to balance cost, security of supply and sustainability in this changing and complex world, overall they do a pretty good job.

In relation to cost, the single electricity market has been a massive factor in putting downward pressure on wholesale electricity prices, but it is exposed to commodity prices. As the price of gas has gone down, we have seen that price fall come through into the wholesale market, and in turn that will find its way through to customers.

We have talked about security of supply. The other aspect of this is the sustainability aspect, and it is that balance between possibly increasing the costs of supporting renewable generation on the one hand, versus reducing the carbon intensity of generation in Northern Ireland as well. The thing that strikes me about that is that it is not just about decarbonising the electricity sector in Northern Ireland. The transport and the heating sectors are also really important in terms of sustainability, and there are real opportunities to leverage off the work that has been done around electricity storage and decarbonisation of electricity by increasing electrification of heat and transport. Some of the technological developments we were talking about earlier on and some of the storage work that has been done feeds right into that space as well.

Q255 **Gavin Robinson:** Good morning. Mr Hayes, you talked about an opportunity with Kingspan that would involve solar generation of energy on industrial sites. How does that work? Is the capital cost met by Kingspan?

Paddy Hayes: No, we have a joint venture. We have a company called Funded Solar, which has two parent companies: us and Kingspan.

Q256 **Gavin Robinson:** You approach the industrial company. Do they pay for the capital cost of the solar panels, or does your joint venture do that?

Paddy Hayes: No, the joint venture does that. Effectively, the joint ventures funds a solar panel on the roof of an appropriate industrial or commercial company.

Q257 **Gavin Robinson:** Do they receive a rent receipt?

Paddy Hayes: Yes. I am not sure of the exact details, but there will be a commercial arrangement under which they receive a commercial benefit for that, which may involve electricity discounts, being able to sell the electricity generated, or a rent receipt. We then will own the solar panel on the roof and provide the commercial benefit back to the manufacturing business.

Q258 **Gavin Robinson:** Are you able to provide that energy directly to the industrial site, or do you have to put it into the grid?

Paddy Hayes: The energy that is generated on their roof—and commercially this is why this works at the moment—can be used in their factory, to the extent that they have demand for it, before it goes into the grid. Any surplus—for example, if there was generation on a Sunday and they were not operating on a Sunday—gets spilled into the grid and get brought into the grid.

Q259 **Gavin Robinson:** What modelling have you done to work out the impact on the domestic user? As we know, and as we have heard over the last number of weeks, domestic users are heavily subsidised by industrial users, and more energy being generated for and by industry will mean that there is less subvention for the domestic users. Have you thought about the benefits, or the consequences, for domestic users, the more industry does their own energy generation?

Paddy Hayes: No, I suppose we have not thought about it specifically like that. At a general level, the point that you raise is a really important one, where supports result in some customers potentially being able to go off-grid and not contribute to the social requirement for the wider network. To the extent to which that is driven by supports, it is a really important debate to have, because it may change the way people think about supports, and it also may change the way industry has to think about pricing the transition and distribution system charges in the longer term.

Q260 **Gavin Robinson:** The trilemma—sustainability, security and affordability—is easy to say. It trips off the tongue, but it does not seem possible to me that you can get to security and sustainability but keep affordability. No matter what happens, are energy prices rising? Are they going to rise as we go towards more renewable technology, as coal comes under greater pressure and there are technological advances to gas, with capital costs and all of that, if there are new generators? No matter what happens, is the domestic user and the industrial user going to face a higher premium for the energy they use?

Paddy Hayes: I do not think you can be definitive about that.

Q261 **Gavin Robinson:** But a renewable megawatt is more expensive than a non-renewable megawatt. Is that right?

Paddy Hayes: It is at the moment, at current commodity prices. As one looks backwards—you are always going to have to look at the counterfactual—electricity prices in Northern Ireland have come down at the wholesale level. I was looking at the 2008 wholesale price, and the system marginal price was double what it is today.

Q262 **Gavin Robinson:** Does that reflect the fuel cost?

Paddy Hayes: It is reflective of the fuel cost, but it also reflects the fact that—as Carla was saying earlier on—there is quite a lot of wind not just in Northern Ireland but in the single electricity market as a whole. When that blows, that effectively changes the marginal generator and means that a more efficient marginal generator is setting the price. Wind and renewables and those supportive technologies are reducing the wholesale price. There is then another piece, which is the support piece that comes in. It is about balancing those equations—and it is a balance.

Q263 **Gavin Robinson:** Thank you. Ms Tully, I was wondering if you could help me with the Moyle interconnector. In your evidence, AES' evidence,

you have talked about a technical limitation for export on the Moyle interconnector. Do you mean export of Northern Ireland energy to GB or, more importantly for security of supply, are we not importing energy across the Moyle interconnector?

Carla Tully: That is a really interesting question. Mutual Energy will be best-placed to answer questions specifically on the Moyle, but I can share that when we look at the role of interconnectors—whether it is the east-west interconnector that connects the Republic of Ireland to GB, or the Moyle interconnector that connects Northern Ireland to Scotland—Moyle was initially contemplated as a form of capacity, a way of shoring up security of supply, with an anticipation that energy would flow from Scotland to Northern Ireland.

The flows are designed to be able to go back and forth, and what happens with interconnectors—and this will happen under the integrated single electricity market—is that the electrons flow based on where they will fetch the highest price. That is one of the ways in which you bring down the overall cost of electricity through interconnection: by creating more economies of scale and linking the systems together. Therefore, whereas today the contracts in place and the structure in place are such that you see the majority flowing into Northern Ireland, the pricing equation is such that it is, in many circumstances, not flowing the way that it should.

Our expectation should be that the electrons flow to the place that they are most needed. The way we know where they are most needed is based on a price at that moment in time, and right now we see that prices in GB have increased over the prices that we see in Northern Ireland, and so that flow should continue to go in that direction. In our testimony, we included a reference to the limitation on export.

Q264 **Gavin Robinson:** I am going to ask you about that. You said there is a technical limitation of 80 megawatts. Who puts that limitation on it? Who regulates it, how do you change it and is it worthy of change?

Carla Tully: Yes, it is worthy of change. It is a decision that would need to be taken by National Grid and by policymakers here, but effectively you have system constraints that are part of the transmission system in Scotland that prevent all of the energy from being able to flow where it could be used. It is not too dissimilar to how we would think about the current structure of the north-south interconnector, and the reason we would want to build a second is to be able to increase the bandwidth—the amount of energy that could flow from one place to another.

Q265 **Gavin Robinson:** If we were to suck out more than 80 megawatts from Scotland, would there be a vulnerability in the system in Scotland. Is that what you mean?

Carla Tully: The transmission system just would not technically be capable of sending more than that out.

Q266 **Gavin Robinson:** It is more than a technical limitation. It is a physical limitation of the system itself—a capacity issue of the system.

Carla Tully: Exactly.

Q267 **Gavin Robinson:** Some of the evidence that we received previously indicated that Moyle was offline at one stage, or refurbished, but that there was no long-term viability in the Moyle interconnector. What is your view of that?

Carla Tully: My knowledge is limited. The Moyle interconnector was out for technical repairs. It is, since, back in, and it is set for a planned outage this year in order for there to be some incremental changes. I do not have the details about how all of that works, but I would suggest that others would be more capable of answering that question.

Q268 **Gavin Robinson:** This may be unfair, but AES is based in Virginia, on Washington's steps.

Carla Tully: Yes.

Q269 **Gavin Robinson:** I do not know if you have worked within that system in America, but how does the regulatory system compare with what we have in Northern Ireland? How easy is it to progress applications or proposals in Northern Ireland, compared with Virginia or America? Are the EPA helpful or more of a hindrance? Is the Northern Irish Government more helpful or more of a hindrance?

Carla Tully: AES is based in Arlington, Virginia, just outside Washington DC. We operate in 17 countries, including the United States, but we do not operate in Virginia. We do operate in California, Indianapolis and Ohio; I could list off several other states. I have spent most of my career working in the emerging markets, but I have also spent a fair amount of time working with my colleagues in California on the way that they have managed the system there, and the investments that we have made.

Q270 **Gavin Robinson:** Do AES frack?

Carla Tully: No, we are not part of an extraction business.

California is probably the best example that we could look at, and we brought over some of our business leaders not too long ago to have a conversation with folks in Northern Ireland, because we see such strong similarities. It is always nice to be compared with the sunny state, but the amount of renewable generation that has come into the system has significantly transformed it, at a similar scale to what we are seeing on the island of Ireland. We also see that the pace of change of the role of consumers is at a level that was beyond what was originally anticipated, and so our policymakers and politicians in California, as well as the system operators, saw that change was coming in the way that the system was overall going to be managed. The pace accelerated even beyond what could have been anticipated at those points in time.

What they have done, which provides some very interesting lessons, is look from a local security-of-supply standpoint. They have catalysed the local utilities, so it is a very different structure. Every state is structured differently within the United States, in terms of its electricity system, but their local utilities have then issued procurements. One of the things that they have done is include a target for storage at the Californian state level. We were able to compete against open cycle gas turbines, with no subsidy, for energy storage and are deploying 100 megawatts for four-hour durations to provide peak capacity to balance out the solar side.

We also won a competitive tender to deploy—on a replacement basis, just as we see in the circumstance we are in today—very high-efficiency, fast, reliable CCGTs, to enable renewable energy to be incorporated more effectively into the system. It is an interesting case study of looking at issues of security of supply on a local basis. You cannot build new plants on greenfield sites in the LA basin; it is not possible. Building new transmission systems is very fraught. People in California, just as in these islands, are not as interested in looking at energy infrastructure or as tolerant of it as they might have been historically. This is something we see in all of the industrialised economies.

We see a changing role of infrastructure. The role that a thermal plant plays may no longer be what it was in the past, but it might, in fact, now be the enabler of decarbonisation and of more renewables coming into the system, and doing so in an affordable, sustainable and secure way. The trilemma is called that because it is really hard, and there are not any good, easy answers, but California presents a very interesting option in how they have begun to tackle it, and we as a business and we as a market are trying to take lessons from there.

Gavin Robinson: Thank you. There is a field trip there, Chair.

Carla Tully: We would be happy to host.

Q271 **Nigel Mills:** It is not unique to Northern Ireland, but there has always been some question about the transparency of the level of profit you make, and how that is accounted for so that we can see exactly what you make. Do you accept that there is a lack of transparency in the profits you report from your activities, or not?

Carla Tully: Not at all. We file our accounts every year with Companies House in September. We file with the regulator every year in accordance with their format, and so all of our financials are fully transparent and public.

Paddy Hayes: I completely agree. All of our accounts are filed for our individual businesses, but even more than that, at a market level in the single electricity market, we have an extremely transparent market. It is very clear how capacity revenues are set by the regulators and how they are awarded to capacity.

There is a very prescriptive code of bidding into the electricity market, which means it is very clear which plants attract what revenues. That is absolutely transparent, not just at the end of the year but almost on a 24-hour basis. It is possible to look into the market and see what plants are bidding and what is being dispatched. There is also the Market Monitoring Unit that looks at that, so in my experience it is more transparent than almost any other market that I have seen at that wholesale electricity generation level.

Q272 **Oliver Colvile:** First of all, thank you very much indeed for coming to see us, and for the very interesting conversation that we are having. I am very keen to make sure that we end up making much greater use of renewables. The issue of CO_2 emissions is a very big one, and unless we do something about it, frankly we are going to find ourselves in quite a large amount of trouble. Obviously, wind has quite a high profile, and so, for that matter, does solar, but could you just explain a little bit as to what you are doing in relation to investing in tidal and marine renewable energy as well?

Paddy Hayes: Marine and tidal are more long-term challenges. We have had a small team—by "small", I mean fewer than five people, maybe three or four people—working specifically on marine, wave and tidal since about 2008. In ESB, we made one investment—a small but very significant investment—in the marine current turbines installation in Strangford Lough, and we put a lot of engineering capability and competence into that during the commissioning phase.

However, as a business, when we then looked at our investment in that, we felt that we did not have the scope or the scale to continue to invest in the long-term technology development. This is something that required a big manufacturer like Siemens or GE, or one of those big industrial people, to take it on, so we sold down our stake there. Since then, we have looked at and made facilities available for testing; we have looked at bidding into various competitions in Pentland Firth, but we have not actually made any further investments in wave or tidal energy.

One of the reasons for that is that, at the current stage of the evolution of the technology, mainstream technology that is commercially viable still looks a little bit far away to us. Our business model is more about deploying technology—for sure, giving it a chance and deploying it early, but deploying somebody else's technology rather than developing it ourselves. That is where we are actively looking at it, but we do not see ourselves making a big investment.

Q273 **Oliver Colvile:** I have always been very keen to make sure that, when the Government is giving any subsidy like this, it should be concentrated on research, rather than necessarily on the manufacture stuff. Frankly, once we have done the research, you—commercial organisations—have the opportunity of being able to take that generation forward. Carla, what are you up to as far as maritime and marine goes?

Carla Tully: AES, as a global company, deploy a lot of different technologies, many in the renewable space. We are constantly monitoring the different types of technologies. We have come to the same conclusion at this point in time: while we still maintain interest and continue to monitor, our role is one of deploying and investing, not operating on the research and development side. While there continues to be great promise around the marine and tidal technologies, they are not yet at a commercial point where we could begin deploying them.

Q274 **Chair:** Can I just ask about the policy towards contracts for difference? What is your approach to that? Should Northern Ireland join in or not, or should it be an all-island arrangement? What is your view on this?

Carla Tully: We are not a developer in renewable energy on the island of Ireland at this point. Whilst we recognise that there is an open question around what types of support systems may be put in place for renewable technologies, we do not take a view on which would be most appropriate. However, we do encourage that decision to be taken as part of the long-term policy and the strategic energy framework be looked at in the context of the trilemma, so that we can ensure that we can deliver to the greatest extent possible on all elements: security of supply, affordability, and sustainability.

Q275 **Chair:** Mr Hayes, do you have a view?

Paddy Hayes: We do. We develop renewable projects; we have a number, and we have seen different mechanisms for remunerating those with different supports. From a policy point of view, given the changing and advancing technologies, and given the fact that—as we have seen with solar—as it has been deployed, the cost of that technology has reduced, it would seem sensible from a policy point of view to have some sort of competitive aspect in terms of people bidding in, to try to reduce the level of support that would be required to a minimum, always trying to keep pace with changes in cost and technology and so on. We would certainly be open to looking at commercial opportunities for developing further renewables in Northern Ireland and bidding into a CfD process.

For Northern Ireland, about 24% to 25% of electricity is generated from renewables. Really, in Northern Ireland, given the costs involved, investment will be required to make sure that that continues to grow; the question for Northern Ireland is whether that will be done at a Northern Ireland level or at a UK level, and that is really a policy point. If a CfD process is being offered, and we have sites and development capability, we will be bidding in and looking to make a commercial case for doing business.

Q276 **Lady Hermon:** Thank you. I have a supplementary question; I have been listening very intently to your evidence, and I must say that you are both very interesting witnesses. It has really been very fascinating listening to you, because you have an expertise in this area. Can I just take you back to the Programme for Government? We have the new

Executive in place. Was energy mentioned in the Programme for Government?

Carla Tully: The initial draft of the Programme for Government did not include energy in the manner in which we describe. There are some small references, but it was not as an energy policy point.

Q277 **Lady Hermon:** You must have been shocked, surprised or disappointed.

Carla Tully: We see that this structure of the Programme for Government, and the manner in which it has been pulled together, is a first time for the Executive, with the outcome-based approach and the desire to keep a limited number of outcomes to keep it focused. As energy professionals, I also recognise at least that what we are passionate about delivering on a daily basis is not always front of mind for everyone else in the world.

Lady Hermon: But it should be critical to a government.

Carla Tully: We are definitely pushing to see that it is incorporated, and we do consider this first draft to be part of the process.

Q278 **Lady Hermon:** That is a very diplomatic reply, but you must have been surprised, because energy is so critical to consumers and businesses moving forward in Northern Ireland. Are both of you, on behalf of your companies, able to share with this Committee your submissions to the Executive as to what you want to see included in the Programme for Government in terms of energy, supply and generation? Are you free to do that? Can you share those submissions with us at the same time as you share them with the Executive itself?

Carla Tully: I see no reason why not.

Paddy Hayes: Again, I do not see any reason not to.

Lady Hermon: Thank you. That would be very helpful.

Q279 **Danny Kinahan:** Following up on Lady Hermon's comments, do you think it will be necessary—and I assume you do—to push not just for the Programme for Government for these five years but to get a long-term policy in place, including for Ireland and the rest of the UK?

Carla Tully: Absolutely. One of the things, again, that can be very challenging in this industry is that the time horizons that we operate on are not necessarily the political time horizons or the policy time horizons that organisations and institutions are structured on. We very much welcomed the National Infrastructure Commission, which was pulled together by the UK Government to address this very issue of being able to move beyond parliamentary terms, look at infrastructure over a long period of time, and make recommendations that could be taken into account and reflected to create that type of continuity.

We were very pleased with the first *Smart power* report that came out from the National Infrastructure Commission. It did take some of those

long views around storage, interconnectors, demand-side response and many of these evolving elements of the electricity system. When we look at Northern Ireland, you are right: the Programme for Government will focus the minds for these five years, but it is the strategic energy framework and the economic policy that will allow us to carry that policy framework forward and provide us, as investors, with the long-term certainty and the policy steer that we will be looking for. That will enable us to make the investments that we think are necessary for the market.

Q280 **Danny Kinahan:** Can I just ask a question on the back of that? Did the UK Government National Infrastructure Commission specifically mention Northern Ireland, or did it tend to just see that as a devolved matter?

Carla Tully: Energy policy is a matter of devolved power. It is within the hands of the NI Executive. We have had engagement with—I apologise for not knowing the exact name of it—an affiliation of the National Infrastructure Commission that is looking at long-term infrastructure needs for Northern Ireland, and have been part of some of those consultative discussions. The first paper that came out from the National Infrastructure Commission was more around smart power, these emerging technologies and where we need to take electricity. It did not have a specific geographic space that it was addressing.

Chair: That was a very useful evidence session. Thank you very much for joining us.

Carla Tully: Thank you for having us.

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