



Northern Ireland Affairs Committee

Oral evidence: the electricity sector in Northern Ireland, HC 51

Wednesday 8 June 2016

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Written evidence from witnesses:

- [Ulster University](#)

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

Questions 1 – 68

Examination of Witnesses

Witnesses: **Professor Neil Hewitt** and **Dr Patrick Keatley**, Centre for Sustainable Technologies, Ulster University, gave evidence.

Q1 Chair: Good morning, Dr Keatley and Professor Hewitt. Thank you very much for joining us. Just before we continue, I need to declare a registered interest. I am a paid adviser to Veolia, which engage in various types of energy production, so I want that on the record. Any other declarations? No. Thank you very much for joining us. It is the very beginning of our inquiry into the energy sector, with a particular emphasis on renewables, but more generally as well, so we are pleased that you are able to come and give us an overview. I know it is not the easiest of subjects. It is a very interesting subject but not the most straightforward perhaps. We are very grateful to you for coming this morning. I do not know who would like to open, but please kick off.

Professor Hewitt: Thank you very much. My name is Neil Hewitt. I am a professor of Energy at Ulster University, and Dr Patrick Keatley here is one of my senior researchers, particularly on the energy market side, which is very relevant to today's conversation.

I have been involved in energy research for about the last 25 years, and as a consequence many of the issues that you are talking about today are not new. They have arisen in the past, especially regarding electricity connections and the price thereof, and the challenges to Northern Ireland industry and suchlike in getting low-cost connections, and the impact that has on foreign direct investment in Northern Ireland.

The issues also of our higher electricity costs have been around for a long time. Patrick will go more into the details of why that is the case. Recently we have been involved under the DETI committees or DETI Ministers in what was called EMAG, the Energy and Manufacturing Advisory Group. We were responsible for technical inputs into a report. I do not know if it is available yet or not with regard to the Committee, with the restructuring of the Government Departments in Northern Ireland. That focused very much on manufacturing, as its title suggests. It highlighted broadly a lot of the issues we are going to bring to you today, but we are going to broaden that into a wider domestic concept as well.

Dr Keatley: Good morning. I am Patrick Keatley. I am a research fellow at the Centre for Sustainable Technologies. As Neil said, most of my work is in electricity markets and focusing on the integration of renewables specifically. I have not always worked at the university. I started work there in 2010. I completed a PhD. Before that I worked in the oil industry, so my background is in energy.

We wanted to do an introduction to the situation at the minute with regard to the market. I do not know how familiar you are with the market in Ireland—the single electricity market. Would that be worth doing, Chair?

Chair: I should start with the very basic level.

Dr Keatley: At the minute we have what is called the SEM—the single electricity market. It has been running since 2007 and it came about, I suppose, partly because of the Good Friday agreement. Instead of Northern Ireland and the Republic of Ireland having two separate markets on such a small shared load, it was decided to put them together into a single, more efficient market to improve levels of competition on the island, to share resources and so on, and to make two small inefficient systems into a slightly bigger, slightly more efficient system.

It comprises a day-ahead market; it is called a market but it is not really a market. It is a competitive price-setting mechanism, but because energy is so heavily regulated it is not a market in the conventional sense. That is the same for electricity markets in most places. They are markets in name only.

The way that prices are set in the SEM is that what are called dispatchable generators, which are coal and fossil fuel fired plants that can be switched on and off, are scheduled to meet the net demand. The net demand in the Irish system is consumer demand, which varies over the day, with peaks and troughs. Demand is lowest at night and rises to a peak in the Irish system between five and six o'clock. You end up with a demand profile that has to be met.

You then subtract the must-run—there are types of generation that are designated as must-run, including wind and peat, as there are some peat units in the south—and a couple of other dispatchable resources. From the expected wind profile and the consumer demand, you are likely to get a net demand profile. That is generated and sent to SEMO, which is the market operator for the system. They then schedule dispatchable plants—essentially fossil fuel plants—in order of price.

The cheapest units go on first to fill the demand stack, and at some point you reach the total demand and the price will be set by the price that that unit submits. In any period the most expensive unit to meet demand sets the price. That price is then allocated to all the generators on the system. Units will bid in at a price below that, but they will then get the marginal price and that is known as inframarginal rent: the difference between their submitted costs—their bid costs—and the marginal price. Everybody else above that level is out of merit. That is basically how the price is set for the energy market.

I should mention there is also a payment called uplift. The energy price that generators bid in at is called the short-run marginal cost. It is essentially fuel price and nothing else. The marginal generator is just recovering its fuel price. It is not making any profit in theory. They get uplift as well, which includes costs for starting up units, because when you start up a unit you have to burn quite a lot of fuel to get it up to temperature and pressure before you produce any useful energy. There are the payments that they get for that.

There is also alongside that a capacity mechanism, which is quite a blunt instrument. It has been, I think correctly, described as being a very blunt instrument. It is awarded to generators for availability. In the SEM, there is no locational component to that. Basically, if you have a plant that can provide generation capacity, you get the payment, wherever it is, and because of that there is less of a signal for inefficient plant to leave the market. As a consequence we still have boiler units, for instance, on the system, which really should have been retired a long time ago, but they are getting their capacity payments so they are still there.

That will change. I will go on to describe that change coming up in SEM. That is basically where we are at the minute. That has been running since 2007. Under European legislation we are required to move towards what is called the integrated SEM and that is designed to harmonise cross-border trading across all electricity markets in Europe. In theory, eventually we will be in a position where a generator in Northern Ireland could be supplying energy to a retailer in continental Europe. Because the markets have all evolved differently, it is very difficult to balance them and has been difficult to trade between them.

The European target model, which is what the I-SEM is heading towards, was supposed to have been in place in 2014, I think, and we got an extension because we had relatively recently started the SEM. First of all we got an extension of two years, and now we have an extension for another year. In October 2017 we must be compliant with the target model and the I-SEM must be active by then. Developing the I-SEM has taken an awful lot of capacity from the market operators, the system operators and the regulators. My understanding is that they will be really struggling to have that in place by October next year.

Alongside that, there is change in the energy market. There is a research programme called DS3, which is an abbreviation of Delivering a Secure, Sustainable Electricity System, which came from the two Governments: the Strategic Energy Framework in the north, and I have forgotten what it was called in the south. The target was 40% renewables by 2020. When that came out in 2010 it was realised that the system has been designed around large, centrally dispatched fossil fuel plants, and moving towards a

system that has a very high level of variable renewables changes that around. The system has to change to be able to manage that.

DS3 was initially a research programme and it has now turned into essentially an ancillary services market that will reward generators and participants in the market for providing flexibility, system inertia and frequency and voltage regulation. These are all things that are easy to do with large, centrally dispatched plant. If you think of inertia in the system, it is provided by steam turbines, for instance—just thousands of tonnes of rotating steel. That is easily able to ride through small fluctuations in frequency and voltage in the system. Wind does not have that. If you put a large amount of wind on the system, it becomes less stable. DS3 has been developed to expand the market for participants who can provide those services.

The move or the trend within the market is that wholesale energy payments will go down because of the expansion of wind, because the market price is set by fossil fuel prices and the more wind you have on the system, the more you force down the wholesale price, but it will require support from DS3, services and ancillary services to match that. The intention is that you spend more on ancillary services but you get more benefit in terms of reduced price from the wholesale end of the market.

That is broadly where we are at the moment and where we are headed. You have seen the submission that we made on the context for energy prices. I do not know if you want me to talk about that, Chair.

Chair: Just briefly perhaps—it would be useful.

Dr Keatley: It arises quite often for us that people say in the newspaper reports that electricity prices in Northern Ireland are higher than elsewhere in Europe. That is absolutely true, but there are a number of good reasons for that. The central synchronous area, although it is not just one market, has a lot of advantages over a small isolated system like Northern Ireland. We have to import 90% of our energy. It is fossil fuel. We are such a small system: there are about 800,000 customers on the Northern Ireland system. In the central synchronous area in Europe there are 400 million people and there are massive industries there that provide a lot of baseload demand, which brings the price down for everyone.

For instance, in some of the comparisons that you will see, we will compare prices in Northern Ireland with, for instance, Sweden, where there is loads of hydro, and most of their electricity is based on hydro, which is like wind in that it has a very high capital cost, but that has long since been paid off so their electricity prices are much lower.

Another example is one of the cheapest places in Europe: Luxembourg. Luxembourg can serve approximately 30% of its own electricity demand. It just imports everything and it imports it from wherever it is cheapest. I think it is the cheapest in Europe. Other Scandinavian countries have access to hydro. France has access to a great deal of nuclear plant, which similar to the hydro thing was paid for a long time ago. To compare Northern Ireland with those markets is not comparing apples with apples. That is it for now.

Q2 Chair: That is very useful. Thank you very much. You got to the point at the end that I was just going to ask about. The initial capital costs, correct me if I am wrong, are not fed into the price calculation when you get the pooling system. Is that right?

Dr Keatley: The theory is that your capital costs are paid off by capacity and fixed costs are paid off by capacity, and operating costs are paid off by the system marginal price. For that reason wind does not fit very well. In a marginal market like the SEM, wind does not fit very well because all the cost is up front.

Professor Hewitt: You are competing against established utilities who can sweat assets that are already paid for. They can run purely on fuel costs without any capital cost consideration.

Q3 Chair: Is that price mechanism, if that is the right word, discouraging the development of renewables for that reason?

Dr Keatley: You have to shoehorn into that system because there is no fuel price. Marginal markets are all the same. A marginal market suits a generator with high operating costs, and the theory is that if you have got lots of different fuels, for instance, they all compete with each other and whichever is the cheapest gets the lion's share of generation and gets the lion's share of energy payments. Most of the lifetime costs of fossil generators are fuel. With wind generators or any renewable generators or nuclear in fact, most of the cost is up front. You pay for it and then reap the benefits over the years, but it does not fit very well.

Q4 Chair: A last question from me, and then I will open it up to the rest of the Committee members. You mention the problem of having to import the primary sources of energy. Given that, what are the prospects of reducing energy costs in Northern Ireland?

Dr Keatley: There are a couple of things on that. We are not very good at energy efficiency. The UK as a whole is not terribly good at energy efficiency. In Northern Ireland we really do not have an energy-saving culture, but there is potential there and that is the simplest way to reduce cost—to reduce what you use. The old saw for that is the cheapest unit of energy is the one you do not use.

The other way to reduce that potentially is to use our indigenous resources. The only significant indigenous resource we have at the moment is wind. Despite all the difficulties that it brings and the fact that we have to re-engineer the system around it, it is a significant indigenous resource, apart from the one that really has not got any traction so far, which is unconventional gas—fracking in the west of the Province, in Fermanagh. If that were to be developed—this is opinion, from reading other people's opinions—it will not have an impact on the gas price because it would still be in international markets, but it resolves the security-of-supply issue.

We do not have gas storage. We do not have a grid. We are almost entirely dependent on gas as our dispatchable source of energy for electricity now, but we do not have storage and we are at the end of a very long pipeline. There never seems to be any kind of willingness to discuss the potential for unconventional gas in Northern Ireland. Politically

it is pretty toxic. We brought this up in the EMAG committee and nobody really wanted to talk about it.

Q5 Chair: Why is that—because of emissions?

Dr Keatley: There are potentially a lot of problems with unconventional gas, but people tend to focus on what has happened in the States, where there has been contamination of water supplies and so on. That is partly a problem with the regulatory environment in the States. In the UK, as a general rule, we are pretty good at producing fossil fuels cleanly. We are not the best in the world but we are not bad.

The main environmental issues that I see with unconventional gas are on the surface in terms of the volume of water that is required for it and the amount of service infrastructure that goes with it. If you were going to develop gas, for instance, in the west, in Fermanagh, you are in areas of outstanding natural beauty and so on, which are very dependent on tourism as an industry. If you start turning that into a fossil fuel development site, we are going to lose some part of that. On the question of what potentially is there, as far as I can see there is no move to identify what that might be.

Chair: No doubt we will explore that further at some point. Thank you very much.

Q6 Gavin Robinson: Thank you to you both. We are all learning from the detail that you are sharing with us so far. For transparency, Chair, can I just check: Mr Keatley, were you my landlord? That is maybe just as a declaration of a relationship with the financials going that way—a good landlord at that. There was a DETI or an ETI committee report in November 2013 about the security of supply for Northern Ireland, and at that stage it was considering a downturn in Ballylumford, a downturn in Kilroot and what it describes as a temporary repair for the Moyle interconnector, but it said that there would never be a sustainable or long-term solution for Moyle. Are you in a position to give us an updated position as to where those three issues are with Ballylumford, Kilroot and Moyle?

Dr Keatley: To meet the security-of-supply issue, Ballylumford had new burners installed. The old station would have been retired—I cannot remember if it was this year or next year. It was due to be retired in any case, and AES were not going to do anything about that. That was under the large combustion plant directive. It is an inefficient, fairly dirty system that produces SO_x and NO_x gases in excess of large combustion plant directive limits, but because of the constraint on Moyle, that was going to leave us short. It came below the level of secure supply that we would have had.

Basically, AES were given the money to put new high-efficiency burners into that plant, and that is now available. That has resolved it temporarily. My understanding is that the issue with Moyle will be resolved this year. That will be back to full capacity this year—full capacity in the sense that the interconnector itself will work in both directions—but beyond that there is constraint at the Scottish end of the interconnector. We can get it across the interconnector but we cannot get it out at the other end. That is in hand, and two or three years is the timeframe for that. That is supposedly being resolved.

Q7 Gavin Robinson: You helpfully outlined some of the difficulties that surround hydraulic fracturing, but given that your focus is on sustainable technologies, am I wrong in thinking that, every time there is a move for an application to introduce a new method of creating energy, it is counterbalanced with an energy of opposition with no cognisance of security of supply? When I think of a gasifier in my constituency—opposition. Gas-fuelled energy facilities are better than coal no doubt, but when you go for gas—opposition.

Every wind turbine that is proposed across Northern Ireland gets opposition, but more than that, and much more fundamentally important than that, regarding the north-south interconnector, it seems to me there are a few concerned about the view from their window and that is threatening security of supply for our Province for generations to come. Is that a fair analysis and, if it is, does your centre have any proposals or requests of the Assembly or Government to make sure that, when those who need to are seeking approvals for new sources of energy, they get those approvals swiftly and not at the expense of a number of nimbys?

Professor Hewitt: I will start, Patrick, and then you can formulate the proper answer. First and foremost we are a research centre, so we are cognisant of all the advances in technologies. Probably the larger scale element of your answer is the fact that we do not make the connection between economic development and energy very strongly. Patrick's figure 1—the graph—which you hopefully saw, showed that Northern Ireland's domestic electricity prices are relatively low, while large industrial prices are relatively high compared with people whom we are competing with outside Northern Ireland. As a consequence, the full economic benefit of anything that we do is not portrayed.

We see an individual activity and it is very easy to go on the internet and find someone who will say this will cause you this, that and everything else, and equally there are elements of bad practice, which are dragged up in the past, for example US fracking. But the big picture is not being portrayed by politicians and others: that this develops lower energy costs, which will in turn attract foreign direct investment, which will in turn create jobs and a higher standard of living.

Q8 Gavin Robinson: They are too concerned by the micro and not concerned about the macro concerns and considerations.

Professor Hewitt: It is getting that, coupled with very strong environmental legislation to make sure nothing does go wrong. That has to be there at the forefront, but once you get that overall picture across—making sure the concerns are mitigated, coupled with the economic benefits being highlighted—it will follow from there.

Dr Keatley: The north-south interconnector is in my view the priority in the system that really needs to happen, because the market does not operate properly without it. Despite the fact that we have Ballylumford cobbled together again and the Moyle will be in action again by the end of this year, we still have a shortfall in the next few years. Whenever Kilroot goes, which it will do in 2025, come what may, then we are really short.

It is a security-of-supply issue. The capacity mechanism that I mentioned earlier on has been successful in that it has given a signal to build quite a lot of new combined-cycle efficient gas generation. Unfortunately it is all happening in the south. It is on the other

side of the constraint. In the Republic they have overcapacity and in Northern Ireland we are short and we have a constraint.

The fact is that that is being held up by some angry farmers. I do not know how many, but it is a very small number of the population of the whole island. The constraint cost for the whole island for the whole system is about €140 million a year, and slightly more than half of that is due to the fact that the north-south interconnector is not there. The market does not work properly. We have a shortfall in capacity issue there. For me, doing that is priority number one.

As to the gas question that you started with, as a research centre the question you ask is edging into political stuff. Every energy project brings out the worst in people for some reason. We work with colleagues, for instance, in India who are putting people on the grid for the first time and there is never a whisper of complaint. When you bring in electricity, they do not care what it looks like. They do not care about power lines. They do not care about power stations. They just want power. Once it is there, everybody expects it to be cheap, everybody expects it to have no or very limited environmental impact, and they expect it to be there all the time, and it is difficult to do. People's expectations are very high with energy projects.

Q9 Gavin Robinson: There is an old saying about generating a lot of heat but producing no light. That could be the story for Northern Ireland if we do not grasp the nettle in energy.

Dr Keatley: The economic development issue has not really been grasped. There are a couple of things on that. The regulator's remit does not include taking a view on economic development, growth in jobs and GDP and so on. That, in our view, should be reviewed and should be taken into consideration. We are unusual in that we do not take that into account when we are allocating costs for electricity.

For manufacturers in Northern Ireland, our nearest competitors are in the south. They take a different view of economic development and they transfer some of the costs of, for instance, network charges and taxation or support for renewables from manufacturing to domestic consumers. We do not do that. We are in the same electricity market and we have exactly the same wholesale price, yet manufacturers in the south have a significant advantage over manufacturers in the north. Part of the reason for that is we do not take the whole-system view.

Q10 Lady Hermon: Just following on from your reply, Dr Keatley, to my colleague's question about the north-south interconnector, who exactly are you blaming for the delay in the construction of this new north-south interconnector? You mentioned farmers. I have to put my hand up and say, speaking as a farmer's daughter here as well as other things, I am really anxious to know who you are blaming.

Dr Keatley: It has been strongly opposed on environmental grounds in South Armagh and North Louth. That is where it is going to be and that is where most of the objections have come from.

Q11 Lady Hermon: Is there evidence to show that most of those objections are from farmers?

Dr Keatley: No, sorry. I was somewhat flippant there. I am not having a go at farmers specifically, but the residents of the route of the interconnector have been able to generate significant enough opposition to get it stalled.

Q12 Lady Hermon: In light of that, what discussions—I know it is not primarily you—do you suggest the new Assembly, the new Executive and the First Minister, who is back as the First Minister, should have with the residents? This is a really serious matter for the long-term supply of electricity in Northern Ireland. Whose responsibility do you think it is to engage with those who are opposing the interconnector?

Professor Hewitt: I should start off with both the electricity regulators, both north and south, because they are responsible ultimately for building the market structures. They need political support then to move that forward. You have SEMO in the north, and CER.

Q13 Lady Hermon: Sorry to interrupt, but are you aware whether politicians have started those discussions? How far advanced are those discussions?

Dr Keatley: I do not know.

Professor Hewitt: I understand it was put out to a planning review, so that would commence in 2017. I do not know if it is true or not, but I have the impression it was being put out to a planning review.

Q14 Lady Hermon: In 2017?

Professor Hewitt: In 2017 or to be completed by 2017.

Lady Hermon: There is a major difference between those.

Professor Hewitt: It is a dim and distant memory. On the basics of that, we are just stalled.

Q15 Lady Hermon: We are just stalled.

Professor Hewitt: Stalled, because I think someone said, “We will put it out to review,” which is a way, in my opinion, of just stalling the process.

Dr Keatley: As to whose responsibility it is to get moving, that is beyond our remit. I am not really sure. Politically, people have not wanted to take it on.

Q16 Lady Hermon: Sorry, when you say, “Politically, people have not wanted to take it on,” do you mean politically politicians have not wanted to take it on—politicians in the area or politicians more widely?

Dr Keatley: Yes.

Lady Hermon: It is a really serious issue.

Professor Hewitt: It is a serious issue to have a large pylon, because this is going to be a high-voltage interconnector. There are going to be big pylons—the Martians are coming. There are big things on the horizon with these large pylons popping up. You cannot realistically put it in the ground, because we need the cooling and we need to make it work properly. You would turn the ground into a huge capacitor basically. It has to go overground or out at sea, and out at sea is expensive.

Q17 Gavin Robinson: Going back to the 2013 committee report from ETI, politicians agreed a recommendation that the planning appeals commission must set an early date to reconvene the inquiry into the planning application for the north-south interconnector so the decision can be made. Where is that now?

Dr Keatley: It is next year, I think.

Professor Hewitt: It is next year, we think.

Q18 Lady Hermon: Thank you. The evidence you have just given is very worrying and concerning. In light of what we just heard, how serious is the potential for an electricity shortfall in Northern Ireland in the near future?

Professor Hewitt: It would start in the near future possibly, but the main concern is that we cannot get industry on to the network. We cannot grow because in many places the network is constrained. If you have an existing factory somewhere and you have 200 employees but you want to make that 400 employees, and you go to the electricity provider and you say, “We need double the capacity,” they will either say, “No,” or they will ask for a significant amount of money because we do not have the infrastructure—i.e. just the size of cables—to bring that capacity to your factory. Short term, no, the lights are going to stay on, but if you want to grow, we are going nowhere.

Q19 Lady Hermon: Are you aware of companies that have made the decision not to expand because of the costs of electricity?

Professor Hewitt: I have been, as I said, involved in energy research for 25 years. I first came across this in about 1990. It was just a small manufacturing company doing furniture. It had a fairly modest uplift in demand and had to move its factory in your constituency, near Bangor. I think it is still within the constituency—you are all right—but it had to physically take on an extra burden because of the lack of electricity infrastructure.

Q20 Lady Hermon: That was a number of years ago. Have things got worse?

Professor Hewitt: Yes, things have got worse.

Q21 Lady Hermon: Dr Keatley, you looked as if you were about to say something.

Dr Keatley: On the generation side, the network capacity is one issue. On the generation side by—I cannot remember off hand and I do not have my notes—2021, 2022, we are close to being in deficit, and by 2025, when Kilroot will be off, we are—

Q22 Lady Hermon: Then we are what? Don't do this. I need to know what that means.

Dr Keatley: There are applications for energy from waste, for instance. There is an application for a large energy from waste plant in Belfast. None of these things are written in stone or dependable. It might work or it might not. That might go ahead. There are other generators here trying to develop projects. At the moment what is firm and what we know is going to happen, in the absence of the interconnector, is that by the early 2020s we are in deficit.

Lady Hermon: That is very worrying.

Q23 Danny Kinahan: I was really keen to get you here and get your input, because I was on DETI for a little while and struggled to really understand at times what was going on, but we seem to be riding for a fall in all sorts of different directions. We have an old, worn-out system that we are just keeping going. Correct me if I have got it wrong, but at the same time we have a European I-SEM trying to come in and we are spending money on trying to get ready for it, but we have not got the system that is able to work. You have not got the interconnector, you have not got a grid that allows you to extend, and we have not got the means to get the renewables in.

Hidden in there is we need some long-term policy and strategy with major spend. Does it then mean we have got to work not just with Ireland but with Scotland, England and Wales so that it is a UK strategy so that we then fit into the European I-SEM? It is all coming at us at the same time and we are just not doing anything other than patching it up with a sticking plaster.

Dr Keatley: It is not quite that bad. Things are not as bad as that. The network—the grid—needs an overhaul. It needs to be built out and expanded somewhat, for a couple of reasons. I mentioned because of the addition of wind, but also for manufacturing. It is difficult, expensive and slow to get connections for manufacturers if you have a plant you want to expand.

The network works fine. The network works okay at the moment, but there are changes that need to be made that are going to require a lot of investment. In terms of whether it is fit for purpose within the European market, if we had the all-island system working properly with the north-south interconnector, and I-SEM was developed successfully and DS3 worked as planned, we would be in quite a good position in terms of overall generation and capacity, assuming investment is made in the network. We would be in a good position.

The restriction on exports from Moyle will go in the next few years and there is the EWIC, which is the east-west interconnector from Dublin to Holyhead. That is operational now

and there are plans for another interconnector to France. If we had those and we had an efficiently operating market system on the island, we would be in pretty good shape. That is the best outcome that we can hope for.

In terms of policy, this is one of the outcomes from the EMAG report: policy is done in bits and pieces. Energy is not one thing. It is spread among different Departments, and they are in some cases unintentionally undermining each other.

As I have this opportunity to mention this as an example, fuel poverty is one thing I have not mentioned so far. If there were a move, for instance, to reallocate some of the policy costs for electricity and move those from manufacturing to domestic, that would whip up a storm of protests and the fuel poverty lobby would understandably get very excited about that. The real cause of fuel poverty, public enemy number one, in Northern Ireland is oil—our dependence on oil for heating. That is not just for domestic. That is the case for manufacturing as well.

To give you an example of incoherent policy, we have had over a number of years the Affordable Warmth and Warm Homes schemes, operated by DSD. That has been very successful in terms of improving the energy efficiency of homes and installing new boilers. That is for the most vulnerable in society, and if you are on the gas grid now, the policy is that you get a gas boiler. You cannot really argue with a gas boiler. The price is regulated, it is highly efficient and it is clean. If you are not on the gas grid, you get a new oil boiler. In recent years the oil price has been lower; I think it is about 35p a litre at the minute, but it has started to ramp back up again, and in the last number of years DSD have installed thousands of oil boilers under the Warm Homes and Affordable Warmth schemes.

Firstly, there is a risk there. There are three components to fuel poverty. One is household income, one is the energy efficiency of the home and one is the price of fuel. We have absolutely zero control over the price of fuel and the price of oil. If that ramps back up again, my fear is that a number of those homes that have received grants of maybe up to £8,000 to improve their energy efficiency and have had oil boilers reinstalled will be right back into fuel poverty because of the oil price.

That is one aspect of that. The other aspect is that installing oil boilers is undermining the target for renewable heat, which is 10% by 2020—DETI's target for that. You have a target for renewable heat in one office of Government, and figuratively speaking down the corridor their colleagues in DSD are doing something else. It needs a more aligned and coherent policy on energy as a whole.

Just one final thing on that is that almost exclusively when we are talking about renewables, we talk about electricity. It is worth bearing in mind that almost half of our energy demand in Northern Ireland is for heat, not for electricity. If we are wanting to address emissions targets and fuel poverty targets and so on, heat is the one that we should look at—or we should look at in more detail than we have up until now.

Q24 Danny Kinahan: On the renewables, you mentioned that wind is our main one at the moment, and yet there is a whole campaign against wind and whether generators are efficient, but we never seem to be looking at where all our hydro points should be. Farmers or people

who own a river will put in for it instead of someone sitting and looking at the key areas that hydro should go in. You also have solar coming in, but it is incredibly difficult apparently with NIE to get anyone to click in solar, so solar is always pushed back. Another question that comes out of that—I am rambling slightly, sorry—is in the report we got today. If big business starts putting in renewables to pay for their own, it is going to put the cost up for everyone else. Is there another way through that? We do not seem to use our renewables cleverly and we do not seem to make it work collectively.

Dr Keatley: The thing that is driving manufacturers like Bombardier to go off and do their own thing is the allocation of cost. That cannot really be argued with. That is why they are doing it. They can do it, and do it more cheaply, themselves. That is a serious risk for the rest of the system.

Up until this point there has been quite a lot of money spent on small-scale renewables, which in my view are not good value for money, because they are not visible to the system operator, they mess with the low-voltage network and I suppose they create quite a lot of problems unintentionally. In order to get economies of scale and so on, you need big renewable systems—grid-controlled, centrally managed—and that is really the way to do that, and the smaller scale stuff is not so useful.

On the solar point, some of the wind generators are now looking at incorporating solar into wind farms. I know Gaelectric are doing this. That is quite a smart move, because they do not have the same pattern. They have quite opposing patterns of generation. You get lots of wind in the winter and so on. You do not have to stretch your network capacity to match that.

On going off grid, there is a risk that, if a lot of consumers decide to go off grid, it potentially increases costs for everyone else. There are projects that are looking to do that. There is a data centre in Coleraine that I am involved in a feasibility study for. The reason behind that is it is the first landfall of the Kelvin link from North America. I did not realise this, but apparently if you are milliseconds ahead of someone further down the fibre optic cable, you can do hundreds or thousands of trades slightly ahead of them, so there is an advantage for them to be at first landfall in Europe, which is Coleraine or Portrush.

The council have started an enterprise zone to the north of the town to try to encourage data centres to come and locate there. They are looking at development of an energy services company—SIB and Invest NI are involved in this as well. That could potentially result in a micro grid for that area. The project that we are looking at is putting a large-scale heat pump in, which can provide heat for industrial usage in the town and cooling for the data centres off the back of the power link that would need to go into the enterprise park. If these start happening everywhere, everybody else is left carrying the can.

Professor Hewitt: Just to respond, I do not want to contradict Patrick, but there are positives with small-scale distributed renewables. We do have a weak network and they, when generating, will support that network. If we are going to challenge, for example, oil boilers as an energy poverty device, ultimately we could change those to electrified space heating. To do that on a weak network we would need renewable support, and you can do that with PV very comfortably. If we go to electric vehicles ultimately, that is going to put further challenges on our network again. Do not disregard distributed small-scale

renewables. They have a very important role in strengthening voltage and frequency of the low-voltage network.

Q25 Ian Paisley: Thank you, gentlemen, for your evidence. Going back to solar farms, are you saying that Northern Ireland does not have the capacity to host solar farms?

Professor Hewitt: No. The opposite. We have capacity—the current capacity we have with wind farms could be augmented by solar, operating and utilising, for example, the same electrical connection. Very crudely it is windy in winter and it is sunnier in summer; therefore the capacity from that connection to your network could be utilised for the full year.

Dr Keatley: The point I was making—Neil and I disagree on this—was the bigger the better. For economies of scale, the bigger the better. We cannot really oppose solar in terms of getting renewables on to the system. We have a good wind resource, which we are exploiting, but there is room to get solar on the system. In my view it should be large scale.

Professor Hewitt: The example is the Lough Neagh development that has been passed through planning now.

Dr Keatley: The one at the airport as well.

Professor Hewitt: A number of big solar PV farms are going ahead.

Dr Keatley: The other point on that is that, because it is so much cheaper than offshore wind, for instance, it will displace the requirement for that.

Q26 Ian Paisley: Are you saying with regard to manufacturing that really politicians, decision-makers, need to grasp the nettle, and if they want more manufacturing plants here they have to take a decision that will ultimately push up the price for consumers?

Professor Hewitt: It is what happens elsewhere unfortunately, yes. That is a European practice—Germany etc. all do that.

Q27 Ian Paisley: Let us be absolutely blunt with it: effectively Northern Ireland politicians have been completely cowardly when it has come to taking that decision.

Professor Hewitt: We will leave you to use that word.

Q28 Ian Paisley: At every opportunity when that decision has had to be taken, they have backed away from it. Is that right?

Professor Hewitt: I do not know if they have been aware. I will be honest and say I do not know if they have been aware of how to address this.

Q29 Ian Paisley: Professor, you are being very generous to politicians. I am giving you a penalty kick here.

Professor Hewitt: I have missed a few in my time as well in my youth. I would say there is a lack of awareness. We have had to address a lot of issues coming forward with creating the Assembly and moving up. We are now getting to the point where the group of politicians we have are now starting to address these proper issues that bring Northern Ireland as a whole forward. One of the big issues is we are not addressing how we get FDI into Northern Ireland. This is only one element, but good value energy costs for industry coming in, creating jobs, is a good starting point.

Q30 Ian Paisley: For the people who are crying, “We want a manufacturing strategy,” the one key element to getting a manufacturing strategy is to demonstrate cheaper energy costs, and the one way to do that is to say there must be a reallocation of cost to the consumer.

Professor Hewitt: One way.

Q31 Ian Paisley: One way. Part of the rest of it that has to be there is that ordinary consumers will ultimately pay more for their electricity and heating.

Professor Hewitt: Yes, which in turn engenders an energy efficiency industry.

Ian Paisley: I get that. I understand that.

Professor Hewitt: Hopefully it will develop numerous SMEs and upwards, who will do a proper job.

Q32 Ian Paisley: Let us just probe a little bit further in terms of the amount of cost. How much more percentage-wise do you reckon consumers should be paying to get this rebalanced?

Professor Hewitt: Do you have that envelope with you, Patrick?

Dr Keatley: We did a back-of-an-envelope calculation. Going back to, for instance, ROCs payments, in comparison with the rest of the UK, 2% of Northern Ireland domestic consumers’ energy bills were for ROCs and for the rest of the UK it was 6%. Depending on what happens with contracts for difference, that is likely to increase anyway. In terms of percentage, we worked out something along the lines of a 10% increase.

Ian Paisley: That is probably quite conservative.

Dr Keatley: It may be. Could I just go back to one of the points about attracting FDI? There is a very strong lobby and case for reallocating energy costs, but it also needs to be borne in mind that it applies to very specific industries. For most industries, energy costs are 5% or 6%. For most manufactures in Northern Ireland it is relatively low, but there are a few key players who have very high energy costs, and they are responsible for most of the jobs.

You can attract a lot of foreign direct investment on the back of, for instance, cheaper labour costs in Northern Ireland. You have an educated workforce that is easier to pay. If you are not energy intensive, you should be attracted anyway. For energy-intensive industries that are competing in global markets, there is a very strong case to make for reallocating costs. But it does not need to be a wholesale thing. That is the way it is done in different systems and different markets in Europe. They look at specifics like, “Is this company competing internationally?” and, “Does it compete against Chinese manufactures, for instance, who have cheap energy?”. If that is the case, that gives you a tick-box exercise. If you meet all those conditions, it reduces the number of privileged companies, so there is less of a burden to be passed over to domestic consumers.

Q33 Ian Paisley: One of the reasons why a large manufacturing company in my constituency has indicated it is closing—it is not the only reason—is high energy costs in Northern Ireland. It is a very sad reflection. A large company in Mr Kinahan’s constituency is probably one of Northern Ireland’s largest energy users in terms of refrigeration costs. In East Belfast, Bombardier is a huge user of energy. Those companies are being squeezed by our current energy pricing strategy, because it has not addressed this issue that the consumer ultimately has got to pay more. What ultimately needs to happen, I assume, is that politicians need to stand up and say, “We need to rebalance this. We need change.” If that is what happens, it is calling for higher energy costs, and you cannot understand how unpopular a position that is for politicians to be in, but it is a realistic position that politicians have to get to.

Dr Keatley: There are a number of other points around that as well. Neil has brought up the energy efficiency thing Neil. Because of the kind of retail tariffs that are offered in Northern Ireland, we have an inefficient retail market because almost everybody is on a flat tariff. If I go home and switch on the cooker at six o’clock and put the chips on, I pay the same price as if I did that in the middle of the night. That is not an efficient market signal. There should be more time reflective tariffs, because the burden of that is carried by manufacturers indirectly.

If you are providing baseload demand—a steady state demand—that is the cheapest energy on the market. For you to have to pay increased prices or pay a proportion of increased prices at five o’clock because consumer demand is driven up by people turning on ovens and lights and showers, that is not an efficient market signal. There are not enough cost-reflective, time-of-use tariffs on the retail side. That would indirectly reduce costs for manufacturers as well.

Q34 Mr Hepburn: I do not know much about electricity or power supply. I am new to this. But keeping on the subject of finance, and just looking at the different sectors—generation, transmission, operation, distribution and supply—what is the profitability of those sectors?

Dr Keatley: I am not sure.

Q35 Mr Hepburn: Are they all in private hands?

Dr Keatley: Yes. It is a regulated market. The generators are merchant generators. The transmission and distribution system is owned by Power NI.

Q36 Mr Hepburn: You cannot give us an idea of the profitability of these sectors.

Dr Keatley: It is a regulated market, so there are profitability reports for all of those elements of the system.

Q37 Mr Hepburn: Do you think you could send them to us?

Dr Keatley: Yes, apart from the generator reports, which have not been published in—

Q38 Mr Hepburn: You have no idea, to give us a ballpark figure, what sorts of profits these companies make over a normal year. Is it billions or millions?

Dr Keatley: It is certainly millions, yes.

Mr Hepburn: Millions. We are talking about a position where we are losing jobs in Northern Ireland because electricity prices are too high and domestic consumers are faced with a dilemma in having to pay more to save jobs, and private companies are absolutely making millions out of an industry that used to be nationalised and is now privatised.

Dr Keatley: As I say, the profitability reports have not been published for a number of years. For the generators, they would contest the accuracy of those because they are so far behind. The last set of profitability reports for generators were showing something like 13%, which is high. They would claim that since then, because there is so much more wind on the system and wholesale costs have been driven down and the capacity market is shrinking, they are not making anything like that. There are competing claims on all sides in this.

Q39 Mr Hepburn: How do we get the true figures?

Dr Keatley: I have no idea.

Mr Hepburn: But they will be there. They must be, because they must have an end-of-year report on how much profit they make.

Dr Keatley: Everything in the SEM for generators is visible, and for the network costs, those are all published by NIE.

Q40 Mr Hepburn: Do we have any idea where the ownership of these companies lies? Are they British companies?

Dr Keatley: The generators?

Mr Hepburn: All of them—all of these different sectors. They are all private companies. Are they British-owned companies?

Dr Keatley: Not all. AES is American-owned, for instance.

Q41 Mr Hepburn: Would we be able to get the information on where these companies are based?

Dr Keatley: Yes.

Professor Hewitt: Companies House would have that.

Q42 Mr Hepburn: Could you send that to us, please? It is amazing when our electricity companies are owned by foreign companies and we are losing domestic jobs through the costs that they are putting on British industry. What sorts of investments are needed—the types of investment and the costs—to bring a modern electricity system to Northern Ireland? What sorts of investments are needed?

Dr Keatley: The grid investment—the figure for that between now and 2020 if we assume we are going to get to 40%—is of the order of €300-plus million.

Q43 Mr Hepburn: Who pays for that?

Dr Keatley: That is distributed through the network charging—NIE would. The grid owners would. That would be part of the network charges.

Q44 Ian Paisley: If I could come in on that, would it be feasible for an outside investor to come in and do that investment? Could they make money from such an investment?

Dr Keatley: From investing in the network?

Ian Paisley: Yes, putting the grid in.

Dr Keatley: I do not know the answer to that. NIE is the network owner, and I think that is a statutory responsibility. I do not know whether it is legally possible for another company to develop the network.

Q45 Ian Paisley: Could the Government sell that as an option? There is money to be made in that grid: a rental space, a rental charge.

Dr Keatley: I do not know of that being done.

Ian Paisley: I am thinking of a long-term pension fund type investment.

Professor Hewitt: Certainly in the past what they call private wires have been challenging in the UK and Northern Ireland to do it, even on a small scale. There has just been that, if you like, legislative challenge to doing it. Physically, it is wired.

Dr Keatley: Although the infrastructure could be owned by someone else—I do not know—the network is a natural monopoly. It is like the road system. As to whether there

could be investment by an outside agent, I do not know what legally the position would be.

Q46 Ian Paisley: It is an infrastructural investment. I do not see why there could not be.

Dr Keatley: One of the recommendations of the EMAG report was that, because most of the need for capacity is in the west of the Province, the case could be made for an investment in the grid in the transmission network—the high voltage part of the grid stretching from Ballymena to Coleraine, Limavady and round to the Sperrins as well. Those are the weakest points in the system at the moment.

A case could be made for that as infrastructure spend similar to the fibre optic roll-out. It would need a case for state aid or whatever, but that would indirectly help everyone on the system. It would free up capacity for new connections and speed up new connections for business, and it would also free up capacity headroom for renewable generators as well. I do not know if the Committee has seen the EMAG report yet. I am not sure if it has been published. It was for Minister Bell—I do not know if it is out yet. It has possibly not been published yet.

Q47 Mr Hepburn: Is there a country that you would class as a model that has the same resources and same capacity as Northern Ireland that you would point me to to say, “This is how Northern Ireland could be if everything was in place.”?

Dr Keatley: The one we have looked at before is Denmark, but Denmark has loads of renewables and is very strong on energy efficiency. They have loads of combined heat and power and loads of shared resources like heat networks, and a big, big push for renewables. We are a similar size, but every system is really very bespoke because everything is different. The Danes have done a great job in getting lots of renewables on and lots of energy efficiency, but it has been eye-wateringly expensive to do.

Q48 Mr Hepburn: It is expensive for whom? The private sector or the public sector?

Dr Keatley: The public sector. In the transparency reports that you see on the comparison of the prices in the EU-15, you see Denmark looking quite cheap. Electricity there is quite cheap. The reason for that is they do not co-operate. Some of that is raised through general taxation, so it is another reason why we are not comparing apples with apples when we compare ourselves with continental systems. If you want to have a clean system with a coherent set of policies all going in one direction, Denmark would be a good example, but it comes with a cost.

Q49 Mr Hepburn: As professionals and experts in this area, would you say that Northern Ireland would be in a lot better position now, electricity generation-wise or supply-wise, whatever it is, if it had been in public hands and not private hands?

Dr Keatley: There is no way I can answer that question. I do not know.

Professor Hewitt: I will probably be less blunt. Whoever owns it needs to invest in it. That has been the problem. All electricity networks grow but not systematically. They do not grow logically. They grow as things occur and the need arises. As I say, we have moved from a very centralised and industrial economy around the Greater Belfast area to a wider distributed industry across Northern Ireland as a whole, and the network has not followed suit. It is one of those things: it needed investment. Some of these problems go back a long way. That could have been done prior to privatisation.

Q50 Dr McDonnell: I have just a couple of questions here. You talked about a clean, working system there just a couple of minutes ago. Where do you feel we are with the overall management of the system? I know that some people were inviting criticism of the politicians, but do we not need an energy Department or sub-department of some sort? I had a big interest in this 14 or 15 years ago, and the big thing sticking out then, which appears to stick out still, was it was higgledy-piggledy piecemeal at a public service level. In other words, while you could have a Minister and you could have all sorts of politicians sitting on committees at Stormont, there is not the co-ordinated team like other places. If there is one thing in Denmark that you were referring to there, it was the co-ordinated team—that they have an energy team and a Department that co-ordinates the whole thing.

Professor Hewitt: I reported to you when you were on the ETI committee many years ago and we raised that same issue. We wanted at the time a Department of Energy for Northern Ireland. We were never going to get it.

Q51 Dr McDonnell: I agree with you still. You won me over at that stage and I agree with you still. The point is that my sense is—and this is no disrespect to anybody and no criticism of an individual—as soon as we get somebody with a bit of expertise and a bit of passion about doing something about some of the issues that you have raised, they are shipped off to somewhere else. They move sideways or they move off to another aspect of the public service. That is an issue for me and it is an issue I would like to see us go through, because it is that sustainable management and a long-term consensus around where we should be going. That then feeds the politicians. Politicians come and go, and with the best will in the world they are generalists. It is the expertise in the detail to convert what you are saying into an everyday working programme.

Dr Keatley: I agree. A coherent energy strategy is what we need more than anything. There is an opportunity to do that now with the Assembly. I will give you an example of where we might end up, and that is without intending to criticise GB, but the number of policy changes that there have been and turnarounds that there have been over the last number of years left investors looking at the market and thinking, “Whoa, we are going to wait to see what happens here.” This has to settle down before people are prepared to invest. We are going to have the same problem or we potentially already do have the same problem in Northern Ireland.

Q52 Dr McDonnell: I have another question coming from a slightly different angle. Is there much remaining stranded costs as a result of privatisation? Way back years ago we had stranded costs where contracts were inflated in order to privatise and prices were inflated.

Dr Keatley: There is only one PPA still. Most of those have been worked out. There is one remaining PPA—power purchase agreement. Is that what you are referring to?

Dr McDonnell: Yes.

Dr Keatley: There is one left.

Q53 Dr McDonnell: How much has the evolution of those disappearing influenced price? Has that allowed prices to go down? Certainly 10 or 12 years ago we were spitting blood about the amount of money that was being wasted on these inflated contracts.

Dr Keatley: The price will have gone down as a result of those being taken out of the mix. It depends who you ask the question, but the generators claim that they have starving children and they cannot make ends meet.

Professor Hewitt: That was counteracted at the time the PPAs came out. Fossil fuel prices were very high anyway in that period prior to the crash. We were working out those contracts at a time of accelerating gas prices. We did not unfortunately see the benefits immediately.

Q54 Dr McDonnell: You touched earlier on something that is very close to my heart—smart metering—without quite going into it. What would it take to bring a smart metering programme to our system in Northern Ireland?

Professor Hewitt: Sorry, can I ask you a question? Why is it close to your heart?

Q55 Dr McDonnell: I do believe it would smooth out the five o'clock burst or the eight o'clock burst in the morning.

Professor Hewitt: Patrick has already mentioned that.

Q56 Dr McDonnell: I do not see why people should be turning on their washing machines at eight o'clock in the morning or five o'clock in the afternoon when they could be turned on at midnight. In fact, I try to persuade my wife to turn on the washing machine when she is going to bed and turn on the dishwasher.

Ian Paisley: How about you turn it on for her?

Mr Hepburn: I bet your neighbours are happy as well.

Dr McDonnell: She insists that that is her role. That is her job. I have no right to—

Chair: Quite right too. What is the answer?

Professor Hewitt: Patrick already mentioned we need smart electricity tariffs to go with that first. The tariff must reflect the supply of electricity, which can be variable, because if it is windy, for example, we will have excess in theory, and therefore you can turn on your

washing machine at eight o'clock in the morning because it is a windy morning and everything is generating and various other things. It is a smarter system we do need.

That in theory exists but we are talking about Google-style information flows. For example, we do some. We currently in our test facilities have a thing called Terrace Street. We have terrace houses built on our campus and they are heated by heat pumps and thermal stores, and the heat pump runs when the market signal says the electricity would be in theory the cheapest, as we can see all that. That works in practice. Our tenants in our houses are as warm as they want to be. You heat the tank of water and then when the house calls for it, it draws from the tank. It is all possible. It is all doable.

Dr Keatley: On the roll-out of meters, to get an all-singing, all-dancing roll-out of meters that can control loads and so on is quite a big undertaking. We have done some work recently on basically doing it as cheaply as possible without having a smart meter—what they call a semi-smart meter. That can either be something that just records half hourly, like a keypad meter, as long as you can capture the information about when you are using energy. A smart meter roll-out would be quite an expensive undertaking. It is something that I would imagine would happen eventually, but it would be quite expensive to do.

Professor Hewitt: Again, it was UK policy but it seems to have gone quiet.

Dr McDonnell: Died.

Professor Hewitt: Okay, died.

Q57 Dr McDonnell: The other thing I would like to just toss with you—you basically touched on it—is investment in the network. Surely that is controlled by the regulator, who allows the network to add so much per year for investment. I do not know whether private investment, as suggested by my colleague here, would be permitted, but how then would you get the private investment back out or how would you get profit or whatever?

Dr Keatley: There is the use-of-system charge on the network.

Q58 Dr McDonnell: Yes. But should the regulator not be permitted perhaps to charge another 0.1 of a penny per unit to speed up the—

Professor Hewitt: It is in the construction of the regulator that it is customer focused, again back to this concept of restructuring the regulator's role to take on board the whole economy of Northern Ireland in terms of making an energy decision.

Dr McDonnell: It goes back to the point that we do not have an overall strategy or an overall permanent team of experts who will drive this. If we had that team of experts embedded in our public service, we would have continuity and those things would all fall into place. That is where I see the investment. I would be prepared to pay marginally more if it was going into the network to ensure that it was going to be marginally less four years down the road.

Q59 Chair: I am not quite sure how it works with the contracts for difference. How does that include Northern Ireland? How does it work in that respect?

Dr Keatley: It is still to be decided whether that is going to go ahead. The assumption is that it will include Northern Ireland at the moment, but there is no guarantee with the GB contracts for difference that it is a competitive auction, and the cheapest projects and proposals will be funded. There is no guarantee that any of those would be in Northern Ireland. The big problem for me with the GB system is that we could end up paying for contracts for difference and see no benefit in Northern Ireland. You pay the money but you might not see any wind farms, for instance, or solar farms developed in Northern Ireland, so that you would not see the impact on wholesale prices coming down.

Q60 Chair: Who decides whether Northern Ireland is included? Is that a local decision?

Dr Keatley: The Assembly is in the throes of it.

Chair: Thank you very much.

Q61 Lady Hermon: I have just a couple of questions that have been raised by the evidence. Going back to solar farms—a really important and sensitive issue for some people—there was an inconsistency, let's say, in the evidence that each of you gave us about small solar farms. Dr Keatley, you said that small-scale renewables unintentionally create problems and we need big, renewable systems. I think those are your exact words. Then, Professor, you apologised for the contradiction—he did not mean to contradict you—but you thought they had some value. Could we have a clear line about solar farms, please?

Professor Hewitt: The solar I was referring to is not a farm. It is the individual solar installations on each home that you see regularly around Northern Ireland. We could go, for example—this is hypothetical—about the electrification of space heating with a thing called a heat pump or other devices produced by, again, local companies in the Portadown area. We could see that, again, raising Alasdair's point about everybody being creatures of habit and things going on at five o'clock and suchlike. All these systems coming on would overload the network. The network was not designed for having all these electrical devices coming on at the same time—or even coming off and adding together is sufficient. Small-scale local renewables on your home would offset that demand in part.

Lady Hermon: That was what you were referring to.

Professor Hewitt: Patrick's challenge with that, and he is perfectly correct with it, is what happens when that starts to creep up through the system and you get too much of that local renewable. You do not use it all—i.e. in summer you will not want space heating—so that starts to work its way up through the system. It is uncontrolled. Potentially there is a control mechanism, and there is a hint of a control mechanism starting to appear in market structures. We talk about a thing called aggregation—that is, can large lumps of these things be brought together in some shape or form and then be controlled? That goes back to the smart grid type of concept as well. There is a lot of work to be done, but the big stuff is good and the little stuff has a role.

Dr Keatley: My point is it is not controllable by the grid. The system operator can dispatch or control large inputs of energy. With the small-scale stuff, if you get too much of it clustered in one small area, it goes on to the grid whatever happens. There is no

control over it from the centre and you could end up with energy flowing in the wrong direction and going through transformers, for instance, the wrong way, which damages them.

It is a control issue. Neil mentioned the aggregation, which is an aggregated control of these things. It can be resolved but it is difficult. Also, lots of small things are more expensive than one big thing. Basically it is an economy-of-scale thing as well. But there is a role for it, I accept.

Professor Hewitt: It is partly that as well. We have lots of small things or individual personal investments, rather than large public or private investments, which have planning and finance issues. You can do things yourself if you have it, or if you are in the unfortunate position that you are in fuel poverty, things can be done for you that can alleviate issues. Fuel poverty is a great thing in a way.

Q62 Lady Hermon: A great thing?

Professor Hewitt: A great bad thing, if you know what I mean.

Lady Hermon: It is a dreadful thing.

Chair: A huge thing.

Professor Hewitt: A huge thing is the right term. Apologies. It is a huge thing, but if you have to pay for energy, that is the worst-case scenario. With many of the technologies proposed, you still have a running cost, so maybe a capital cost of solar or some other such thing gives you effectively free energy, and that portion of free energy might start to resolve energy poverty issues.

Lady Hermon: I am very glad we asked for clarification on that point.

Dr Keatley: It is an ongoing debate.

Professor Hewitt: He forgets I am supposed to be the boss, but it does not work like that.

Q63 Lady Hermon: I am sorry my colleague has left, and I think there was agreement that in terms of Northern Ireland it is most unlikely now that we are going to get a separate Department for energy. We are agreed on that. In the absence of that separate Department, and you emphasised the importance of it, both of you have made reference to EMAG, which is the ministerial Energy and Manufacturing Advisory Group. You referred to reports. In the absence of a separate Department, is this something that could be expanded or its role expanded? How useful has it been? Who sits on it? What is the agenda? Will it continue in the future?

Dr Keatley: We do not know. It had to report to Minister Bell before purdah, before the Assembly elections. It was quite a short timeframe. It only ran from February, I think, and adjourned in February. The report went in. The report included a suggestion that maybe the committee could be reconvened on the other side of the election. Whether that will happen, I do not know.

The committee was a very useful thing for highlighting the problems for manufacturing in NI, but it was not the whole picture. It was not a lobbying organisation quite, but the focus was very specifically on manufacturing and business.

Q64 Lady Hermon: Tell us about the composition of EMAG. You sat on it.

Dr Keatley: David Dobbin was the chair, from Dale Farm. I think he is still there. Mark Sweeney from Caterpillar was on it. There was Manufacturing NI, Caterpillar, Thompson's feeds.

Professor Hewitt: AES, as a generator.

Dr Keatley: AES. Who else? There was a union representative as well.

Q65 Lady Hermon: We can check the details. You gave evidence to them, did you?

Dr Keatley: We were not committee members, but we were technical advisers to the committee, so we were at all the meetings and there was input. We made presentations and wrote sections of the report and so on.

Q66 Lady Hermon: Presumably you would advise that the new Ministers should think very seriously about re-instigating this.

Dr Keatley: Yes. Without patting our own backs and trying to create a job for us, I felt it was a very useful thing. I hope it was quite useful for members of the committee who were not really familiar with things like the context of prices in Northern Ireland when you compare them with the rest of Europe. There was an assumption from some people that all power systems are the same and it can be only that we cannot do it right in Northern Ireland that prices are higher.

Q67 Lady Hermon: Finally, as the Committee goes forward with this particular inquiry, where do you think we should be focusing our attention in light of what you have said to us this morning?

Dr Keatley: Coherence of policy.

Lady Hermon: Yes.

Dr Keatley: What is going to happen with CFDs. That is a devolved matter but that needs to be resolved.

Lady Hermon: And CFDs are?

Dr Keatley: The contracts for difference—the new support mechanisms—what is going to happen with those, and the north-south interconnector must be pushed.

Lady Hermon: Not necessarily in that order, but those are the three. That is very helpful. Thank you so much indeed.

Q68 Danny Kinahan: I find that fascinating—that policy is what we really need to focus on. Just one thing: I used to work in the auction business. At auctions it was often felt that certain dealers ring prices. When you look at how pricing is, I find it very hard to understand exactly how prices are come to. When everyone there is within the electricity trade and knows it, and you have the regulator, are you confident that we have a system that is working to get us the lowest price possible but at the same time building into it the allowance to invest and to build business?

Professor Hewitt: Patrick will think of a proper answer and I will give the initial answer. The first bit is the market structure was designed for those burning fossil fuels. That sets the price. As we move forward and are potentially heading towards 40% renewables, they are not price makers but price takers, to use market terminology. No market structure yet exists to do that. How do you set a price for the wind blowing? How long do you write the capital out for? What do you build in for maintenance and ongoing development? It does not exist yet, as far as I know. Is that right? There is no market structure that I have seen that does that—that allows for a renewable energy lead.

Dr Keatley: No.

Professor Hewitt: That is our first challenge in terms of market. The price generated is based on effectively fossil fuel and then all the other parts—ancillary services and all the other parts on the side. The market structure is a big research project—our next one. I am not touting for it, believe me.

Dr Keatley: It is in flux. We have really just got the hang of the SEM and now we are having to change to the I-SEM. There were problems with the SEM. It initially looked like a great thing and it was widely applauded as being a great thing and it worked reasonably well, but ESB is still massively the biggest player in the SEM.

The SEM only comprises one market. It is a day-ahead market where everything is visible, but there is limited liquidity in the SEM. Also within that there is a unit within the regulator's office called the market monitoring unit, who are supposed to be the bad guys who go and chase everybody up and demand to know why they are bidding these costs and how they justify this.

It has been said that it is a small unit, it is not very well resourced and they probably could have made themselves a bit busier. Whether that is addressed in the I-SEM and the new market structures, I do not know. The intention of the I-SEM is that, instead of just the day-ahead market, there is now a futures market, a day-ahead market, an intra-day market and a balancing market. There is loads more liquidity potentially, so that should go some way to reducing the potential for ESB to throw their weight around.

Professor Hewitt: Again, we are just stuck with this concept of how we set the price. That is still our big barrier. When somebody comes up with that one, there is probably a Nobel prize in there somewhere.

Danny Kinahan: So you do want one.

Professor Hewitt: No. Oslo is nice but not that nice.

Chair: If you have no further points, then can I thank you very much indeed for coming? It has confirmed what an involved subject area it is and it has given us a lot to think about and look into. It is a very good first session. Thank you very much for joining.