



HOUSE OF COMMONS

Scottish Affairs Committee

Oral evidence: [The renewable energy sector in Scotland](#), HC
745

Wednesday 13 April 2016

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Written evidence from witnesses:

[Scottish Council for Development and Industry](#)

- [Scotland Against Spin](#)
- [Renewable Energy Foundation](#)
- [Institution of Engineers and Shipbuilders in Scotland](#)

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Members present: Pete Wishart (Chair); Kirsty Blackman, Mr Christopher Chope, Margaret Ferrier, Chris Law, John Stevenson, Maggie Throup

Questions 222 – 320

Witnesses: **Gareth Williams**, Head of Policy, Scottish Council for Development and Industry, **Dr John Constable**, Director, Renewable Energy Foundation, **Linda Holt**, Scotland Against Spin, and **Professor Iain McLeod**, Institution of Engineers and Shipbuilders in Scotland and the Scientific Alliance Scotland gave evidence.

Q222 Chair: Welcome, Mr Williams, to the Scottish Affairs Committee. This is the first session since we have come back from recess, and we are very grateful that you have been able to find the time to come down and give us some oral evidence. Perhaps for the record you could explain who you are to the Committee, and if there are any opening remarks or comments that you would like to make.

Gareth Williams: Thank you. I am Gareth Williams. I am Head of Policy at the Scottish Council for Development and Industry. We represent about 1,200 members across the private, public and social economy sectors in Scotland. It is nice to be invited down on a warm, sunny day, which we have not had in Scotland for a while.

By way of opening I should say that we have recently published a long-term policy blueprint focusing on three particular challenges for the Scottish economy and for the UK more generally. Those are productivity, innovation and internationalisation. We also believe that Scotland's long-term success will be based on digitalisation and the transition to a low-carbon infrastructure economy, which is obviously most relevant to what we are talking about today. We have always supported the balanced energy mix of generation for Scotland, the UK and increasingly Europe, and recognised that Scotland has some comparative advantages in relation to renewables and other technologies that we would like to develop fully.

Q223 Chair: I am grateful. We are halfway through this inquiry. We have received a number of submissions, both written and oral. The Committee has been to Orkney to look at and further understand some of the development that we have there. We have had a sense that this is a dynamic sector within Scotland. Something like 20,000 jobs were dependent upon the renewable sector in 2014 and it has led to something like £1 billion worth of investment in the Scottish economy. I do not know if these are figures that you personally recognise or the SCDI recognise. In your view, just how important has the support been from the UK Government in the growth of this sector?

Gareth Williams: Those are figures that we have seen as well and would recognise in terms of our own membership's activity within the sector. Clearly, renewables have an important role within power generation to the wider economy and are now the largest source of that within Scotland. We have talked about capital investment and employment, and there are community benefits to be taken into account as well.

Going back to the original challenges I mentioned, investment and innovation are areas that renewables have been prominent in, and increasing numbers of companies are selling into international markets, so we would see an important role for the sector in addressing those particular challenges.

More generally as well in terms of the transition to a low-carbon economy, it is now over 10 years since the Stern report, and the evidence at that time was transitioning early saves costs later on. We would see a longer-term benefit there and a reputational benefit as well in relation to the attractiveness of Scotland to skilled people and the links to knowledge exchange and so on that are evident across the renewable energy sector. We would say that renewable energy has benefited particularly from strong support from the UK and Scottish Governments—for example, renewable generation subsidies, targets, emissions reduction targets—all of which were based on strong cross-party support, and we think it is regrettable that that has broken down to an extent.

Q224 Chair: Before you go on to that—there will be further questions about the impact of some of the announcements that have been made recently by the UK Government—broadly, is there a sense from SCDI or have you detected an impact on the sector by way of confidence or investment? Is there anything that you have detected thus far that is perhaps concerning to your organisation?

Gareth Williams: There has certainly been an impact on confidence. You can see that in the international rankings for attractiveness of investment. This is a sector that has long lead-in times and significant upfront costs in relation to things like environmental surveys and consents. It is profitable but there are risks in getting involved and it requires clear routes to market. The impact now we have heard about, and there have been some job reductions and some businesses looking to move out of the area and move into other areas, but it is not fully evident because there is a rush to get projects in before the closure of the renewables obligation, and the risk obviously is that at that point the work will dry up and we will face something of a cliff edge. In relation in particular to civil engineering, that will result in loss of the investment pipeline effect throughout the supply chain, particularly SMEs, and a loss of skills. We can see a wider effect as well, that domino effect, from one project into other projects that were perhaps relying on the same good connections, and a great deal of uncertainty coming into it and the need for good reinforcements in particular areas with projects coming in and out of plans at an alarming rate.

Q225 Chair: Just by way of a last introductory question, it is quite apparent and obvious that this sector in Scotland is larger than in the rest of the United Kingdom. Is there any particular reason for that, other than the resource issue and the fact that so much of the natural renewable resource is based in Scotland? Are there any other reasons that the Committee should be aware of for why Scotland in particular seems to have so much more of a resource when it comes to renewable industries?

Gareth Williams: You have highlighted the resource aspect, which is important. There is a legacy of the hydro sector that we were involved in developing decades ago and the wider energy sector where Scotland has always had strengths in a range of technologies—it has been able to build on that expertise and those skills—combined with the resource and then the favourable Government policies. We have had a strong, supportive policy environment in Scotland as well and that has been consistent. I think that has helped to attract investment into the Scottish sector, perhaps in a way that has not quite been seen across the rest of the UK.

Q226 Maggie Throup: In your written evidence—thank you for providing it, and you have also just touched on it now—you indicated that Scotland is at the forefront of the development of hydropower. Apart from producing power, I remember it as a tourist attraction—when I visited Scotland, we had to go and look at the hydropower stations. We have also received evidence that raises concerns about the lack of indigenous manufacturing industry related to the subsections such as wind and wind turbines. Given that, as you have just indicated again, there is a high proportion of renewable energy, wind turbines and various other things and mechanisms for renewables in Scotland, why do you think that there is not more manufacturing of the products actually in Scotland?

Gareth Williams: Looking back, there have been a number of missed opportunities, not just within Scotland but across the UK, where the early lead in onshore wind technology was lost and other countries took more of a leadership role and then have been better able to sell their own manufacturing into the Scottish-UK market. Looking back, we had very high hopes for the development of the offshore wind sector, and I suppose five years ago there would not have been too many people who would have thought that we would not have seen some more manufacturing based around that in Scotland. Clearly, market uncertainty has been a factor in that, albeit we are nearly at 2,000 offshore wind turbines in Scottish waters. We think there are still opportunities for manufacturing going forward—and I am happy to tell you one or two of those—but also do not forget the importance of operations and maintenance activity. The Scottish oil and gas sector has grown to a huge extent, largely based on the expertise of the service sector in the North Sea and then selling it internationally. That is a massive opportunity as well.

Q227 Maggie Throup: That is an ongoing opportunity, isn't it, rather than just the initial manufacture?

Gareth Williams: That is right, and there are onshore opportunities there, but offshore as and when that really takes off.

Q228 Maggie Throup: Do you think there are opportunities for Scotland, and indeed the wider UK, to lead on the development of the emerging renewable technologies and not just the development but the manufacture of the renewables?

Gareth Williams: Yes. I think there are strong opportunities there, and not just in relation to renewable electricity but in relation to renewable heat as well, and the transition from thinking about energy sources to more integration and energy systems. We have the world's first floating offshore wind platform, the Buchan Deep project, and that should be making progress this year. We have the world's first commercial tidal array project as well. In relation to all these innovative technologies and innovation more generally, there is always a risk and it does require policy support and at times capital investment as well from public and private sources. Getting the cost reduction down is related to the build-out rate and avoiding a stop-start approach to support.

Q229 Maggie Throup: Going on from that with regard to support, thinking about perhaps the hydropower and also the contrast to that with the wind sector, are there lessons to be learnt from those two sectors for thinking how the emerging renewables could be supported? You have just talked about policy and not to stop-start. How else could those be supported to develop indigenous manufacturing?

Gareth Williams: There is a need for scale around emerging technologies in particular. You need to be able to test different versions of the technology. If something goes wrong with the technology, you need to be able to understand why that is, and if you have only one device available then it is very hard to ascertain that. Probably through more investment in the more mature end of research, development and demonstration. There is still that gap between the nascent technology and then the commercial exploitation of that, but there are some good examples. We have the test facilities around Scotland. In relation to hydro, Scottish Water has developed a water

innovation centre that will help progress technologies there. In relation to hydro as well, we have to bear in mind the large-scale pump storage opportunities that have a key role potentially in balancing the system, and then the smaller-scale hydro projects, and different interventions will be required at both ends of that scale.

Q230 Margaret Ferrier: Mr Williams, we have seen the closing of the renewables obligation and the delaying of contracts for difference and changing of the feed-in tariffs. We have heard it could have a disproportionate impact on Scotland. What are your thoughts on the recent changes to support for the renewables sector? Do you feel that it will result in a significant fall in levels of investment?

Gareth Williams: From what we have heard, that will be the case and I have already touched on some of the consequences of that. There will still be opportunities as costs come down, and with onshore wind and solar in particular. They are very competitive against other low-carbon technologies. There may be projects that do not require any subsidy in order to proceed. We are hearing about greater co-operation between larger businesses, for example, who are prepared to pay for development of generation that would supply them particularly. We have been involved recently in the launch of an initiative called Unplugged that is trying to encourage 500 Scottish companies to invest and provide a total fund of about £500 million and take more circular approaches, taking responsibility for their own power generation from renewable sources and trying to reduce their environmental impact. There are still some opportunities as well.

Q231 Margaret Ferrier: What we heard when we took evidence in Orkney was that there were many projects that are now either on hold or completely will not go ahead at all because of this. Some of the witnesses told us that although they understand the reasons behind these policy changes, possibly the way that they were introduced could have been different and could have been handled better.

Gareth Williams: Those projects that still have routes to market of one kind or another have potential to attract investment and go ahead. It is those projects that do not have that at present that are at risk. As I said before, it looks as though it could be a bit of a cliff-edge. In terms of the changes to policy, we would see the way they were introduced as regrettable. There has been a lot of uncertainty in recent times through the electricity market reform process and so on. There is a recognition—I have already touched on it—that subsidies can come down over time, but it was a shock that this should be withdrawn as quickly as that.

Q232 Chair: Should the industry not have been better prepared, given this was a very clear manifesto commitment from the Conservatives when they went to the last election and it was very clear that they were going to withdraw support for renewable obligations? I know it seems to have come as a shock to everybody, but why should it when it was pretty clear that there was a clear commitment to pursue this line?

Gareth Williams: Timing comes into it. There are a number of different ways of interpreting what was said in the manifesto and when that might come into effect. Thinking back to that period, there was a fair degree of concern about proposals in other manifestos as well. The outcome of the election and whether that was going to lead to

another coalition Government, for example, was not one that many people were able to predict. Arguably, that should have featured somewhere in relation to scenarios, but it has been a surprise.

Q233 Chair: The reason that we were told that this is being pursued is the overspend on the levy control framework and the forecasting that was showing that there would be increased deficit as you went up towards 2021. We have also heard from the Committee on Climate Change, who say that there are going to be additional costs involved in the change in Government policy, particularly with CfD and with the removal of the ROs for onshore wind. Do you have any view about what the economics of these policy announcements are?

Gareth Williams: I referred earlier to the Stern report that was instrumental in developing the Committee on Climate Change approach and the essential message that you need to invest early in the low-carbon energy transition. The costs have come down in relation to the need to have sources of renewable energy and they compare quite favourably with other forms. I have said already that we understand reductions over time, and that was the intention behind these schemes, but we would agree that the approach that is taken is likely to increase costs if we were going to stick to the commitments that we have made in relation to climate change. The 2020 targets are not unimportant, but we need to be thinking about 2030, 2050 and how we hit carbon budgets to climate change targets at those times. I am not sure we can say that the strategy that is in place is taking us in that direction.

Q234 John Stevenson: Given what has been asked and the policy changes, quite simply, what do you think needs to happen for Scotland's renewables sector to reach its potential?

Gareth Williams: There are probably some short-term actions that need to be put in place, particularly around the grace period for projects and ensuring that those are reasonable, and ensuring that there are clear routes to market for all technologies, whether they receive support through one framework or another. We have always believed that the island generation should be a high priority. I know that the Committee has been to Orkney. We do not have clarity as yet about the support that would be available for island generation. We would see onshore wind developments there and development of associated transmission infrastructure as key to unlocking the wave and tidal opportunities that will come after that, and to generating community benefits as well. There have been strong political commitments there and we think that those need to be delivered at a scale that allows projects on all of the main island groups to go ahead. That would certainly be a priority. I hope that judicial reviews of offshore wind allow projects to proceed, that we have more clarity about future support for marine energy, and that is not as far away as I think the UK Government has suggested.

Another area that I have not touched on so far is repowering of existing sites, getting the environment in place for those business decisions that will start to take place over the next two or three years and potentially offer some scope for manufacturing in addition to the operations in the marine sector that I have already referred to.

Q235 John Stevenson: In your evidence, you also argue that electricity demand is likely to increase because of population growth and heat and transport increasing. How do you justify that assertion?

Gareth Williams: We can see specific examples within Scotland around electrification of transport in particular, especially the rail network at present. They are fairly commonly held views, but we are involved at present in our national needs assessment, which the Institution of Civil Engineers has kicked off. That is going to be based on some work by the Infrastructure Transitions Research Consortium, a group of UK universities, and they will be looking at various scenarios for long-term energy supply and demand. Maybe I could mention that we believe that the UK will stick to its climate change targets, while there will be different options, radical changes on the demand side, such as energy conservation and efficiency, electrification of heat and transport and distributed energy will feature, and on the generation side there will be a portfolio of low-carbon supply technologies, including distributed renewables and solar PV, offshore wind and nuclear, with gas, with CCS as a transition fuel and backup for intermittent renewables. We are taking an evidence-based approach to that assertion, but the extent to which that is true—

Q236 John Stevenson: On that basis, do you think that view is informing policy?

Gareth Williams: No, I do not.

John Stevenson: You do not?

Gareth Williams: No.

Q237 Chris Law: That touches on the questions I have. It is great to see Scotland making such progress in generating renewables, and it has been for quite a long time, going back to the hydro dams of course. A big area is fuel poverty, particularly in the rural areas where a lot of the renewable energy is now currently getting produced. I wanted to know why there has not been progress made in heat and transport so far and what the reasons are behind that. Is it things we are still waiting on in terms of innovation, or is it policy? I was thinking of innovation, for example, in battery storage, but also in policy here in the UK.

Gareth Williams: In relation to heat, it is welcome that the UK Government are going to continue support through the renewable heat incentive, and Scotland has benefited disproportionately so far from projects that have come forward. That is partly related to the number that are off the gas grid and also our climate. We are not making as much progress as set out and more needs to be done with that. Public sector leadership in this area is really critical. We have seen some examples such as the project at Borders College that led to a double-digit reduction in heating bills there. There are about 30 or 40 other sites that Scottish Water has informed us that it thinks have good prospects. On the back of that, there is interest in manufacturing, coming back to a point that was made earlier. There are some reasonable prospects for heat, particularly if policy support continues and is well-targeted.

On the transport side, fuel prices come into that to a certain extent as well, and there does seem to be a tailing off of interest in some forms of more environmentally

friendly fuel in recent times. The ambitions are still high there, and I think there is a strong commitment to making it happen and providing the necessary infrastructure.

Q238 Chris Law: In relation to the rest of the UK, is Scotland lagging behind or is it on par with or punching above its weight on progress with renewables?

Gareth Williams: In particular technology?

Chris Law: Yes.

Gareth Williams: In renewables generally, we would say that Scotland is punching above its weight. There are some areas where there are advantages in other parts of the country—no offshore wind, for example, as the environment is more friendly to develop that in shallower waters, and we have deeper waters in Scotland. That does present opportunities, such as the Buchan Deep project that I have already referred to, in some niche areas to really be world leaders.

Q239 Chris Law: I was looking at some of the things that have been written in your evidence, and you said the UK needs a long-term plan for UK energy, setting targets and levels for support of renewables. How do you see that looking, and what range of things would need to be implemented for that to change?

Gareth Williams: I have already said we need to be thinking 2030, 2050. I am not going to pretend that I would know what should be in that UK energy plan, but some of the work that we have been involved in through the national needs assessment I think would be very helpful in informing the National Infrastructure Commission, and it should have a pivotal role in developing the evidence base independently of political processes around what that plan should be. It should be working very closely with the Scottish Government and the Scottish Energy Advisory Board in doing that, and I am sure—I have touched on a number of areas already in terms of the demand side and generation—that storage will feature very prominently within that. They have already published a report on smart energy and flexibility of systems to cope with more intermittent generation. As long as we approach it in an evidence-based way, we focus on security of supply, affordability, decarbonisation, and we see ourselves as part of the broader European system as well and think about interconnection, there is certainly a good opportunity to develop that long-term plan.

Q240 Chris Law: In the context of what's happened even the last 12 months—the removal of the renewables obligation is a year early, and the £1 billion carbon capture and storage facility, which would have created jobs and long-term growth and reduction of carbon emissions in Peterhead, and the fact that in the city of Dundee, where I am from, we are looking to hopefully do an offshore wind farm project—with all those uncertainties, do you believe this Government have a wrongheaded approach, not to mention their approach to nuclear power that at the moment looks like it is going out the window?

Gareth Williams: We support a balanced energy mix and we would see roles across the UK for all those different forms of generation—renewables, thermal with CCS—and I would agree that that was an extremely disappointing decision after all the work that went into it, with the prospect of investment going to be committed and the

wider supply chain that could have been developed around that. Hopefully CCS can come back in some shape or form, albeit not at Peterhead, and it might be later than we had hoped for.

I can see why the Government have taken certain approaches, and there are positives around the support for offshore wind, the continued support for heat, the announcements around innovation in the budget, but the overall context is uncertainty and concern about security of supply, affordability and decarbonisation over the next 10 years and beyond.

Q241 Chris Law: Given the fact that there is such strong support for renewable energy in Scotland, and also given our capacity for creating a lot more energy through renewables, do you think it would be a good idea for Scotland to have its own separate energy policy in order to meet the needs and aspirations of the people of Scotland?

Gareth Williams: We continue to support energy policy as a reserved area because the systems are so integrated, and we think that the single GB market is fundamentally linked to a UK policy. Going forward, it was certainly heavily built into what we said to the Smith commission and what came out of the Smith commission. It is probably unhelpful to think about reserved and devolved areas that are shared responsibilities and, given the size of the energy industry in Scotland and the potential that it has, we would hope that the Scottish Government and the Scottish Energy Advisory Board would have very strong voices in shaping UK policy, whether with the National Infrastructure Commission or the UK Government.

Q242 Chair: Have you any particular concerns about the energy mix in Scotland, given in the last few weeks we have seen the closure of Longannet and the end of coal-fired generation and concerns about intermittency of some of the renewable technology? We always hear this phrase “lights going out”, like a general concern about supply issues and baselines. When you observe what we have in terms of energy mix, is there anything where red lights come flashing to you?

Gareth Williams: We believe that a strong baseload is important and we have looked at what National Grid and others have said about the issues following on from the closure of Longannet. There are some risks there. Clearly, the transmission infrastructure is being developed over the next two or three years, and that is going to allow for significantly higher power flows from south to north, as well as north to south.

Q243 Chair: As a Committee, we have not looked at the transmission infrastructure. We are going to have conversations with National Grid and SSE and some of their power suppliers. The grid is designed obviously for a different era, a different age. In your view, is it equipped to deal with the renewable age, with a higher dependency upon renewable sources of electricity? Can it accommodate it?

Gareth Williams: It could not accommodate it if there was not the investment going forward. There has been record investment over this current investment period, and part of that is to be able to cope with more renewables on the system and changes in power flows. There are challenges with that, and it is likely in the future that the distribution system is going to play more of a role in balancing intermittent generation

and demand response and so on. We look generally across the UK and have concerns about security of supply over the next 10 years, not just in Scotland, and the specific concerns about how the system would respond to a blackout and how it could be restarted. The closure of Longannet certainly makes that more of a challenge for central Scotland. That would have economic ramifications, clearly.

Q244 Kirsty Blackman: Some of this stuff you have talked about already. You have expressed a hope that the consultative role the Scottish Government are going to have on renewables policy will be useful. Do you think that it is possible for there to be a distinct Scottish policy within the UK Government setting? If the UK Government are still making the policy, do you think they are going to be able to reflect those Scottish voices that might be quite different?

Gareth Williams: We have to be realistic that there will be policy differences between the UK and the Scottish Government. That said, you would have thought there are common economic interests when it comes to energy policy and the security of supply, affordability and decarbonisation, the commitments that we have at European level and a global level and the commitments we have to try to achieve those at the lowest cost possible. If we assume that Governments are going to take an evidence-based approach to doing that, then you would hope that they would arrive at pretty similar conclusions. The role of the National Infrastructure Commission removing some of the politics from it offers further potential. There definitely has not been too much sign of intergovernmental working over the last year or so, and there has been a bit of a lack of notice or a lack of concentration around decisions, but a lot of it has been driven by Treasury rather than necessarily the relationships between DECC and the Scottish Government, so that is an additional complication.

Q245 Kirsty Blackman: A question about how the UK Government's policy is shifting: there has been a shift in the UK Government's policy since the election, and some of the things coming through that you have expressed concerns about are increasing VAT on certain renewable technologies and withdrawing the CCS funding. You have said a number of times about decarbonisation still being a pillar of what the Governments are working towards. Do you think that some of the decisions the UK Government are taking are shifting us away from that decarbonisation agenda?

Gareth Williams: I would agree with that. Particularly we have touched on CCS, for example, and it does not seem as though thermal generation could have a future without the deployment of CCS. The Committee on Climate Change has absolutely said that that was a retrograde step towards the 2030 targets. I know that is just one example but it is a pretty fundamental, important one.

Q246 Kirsty Blackman: Do you think that the cumulative impact of all of these policy shifts is going to affect how much we manage to get towards goals of decarbonisation? Do you think they all add up to make it worse?

Gareth Williams: Yes. I do not want to ignore some of the positives as well. I have already touched on those: offshore wind, heat and innovation. I should say, if you look at the cumulative impact on those areas where there are high levels of investment

or would be high levels of investment that are really critical to meeting that particular challenge, then the story is not a good one.

Chair: Great. I do not think we have any further questions. I am looking around colleagues to see if there is anything further anybody wants to ask Mr Williams now that we have him here, but it looks like there is not. I would like to thank you for your evidence. If there is anything further that strikes you that we maybe have not asked you or you have seen in the course of this inquiry that we maybe have not considered properly, please get in touch with us. This inquiry is probably going to run until the end of June, so if there is anything further that you observe then please get in touch with this Committee. Thank you for coming along this afternoon.

Examination of Witnesses

Witnesses: **Dr John Constable**, Director, Renewable Energy Foundation, **Linda Holt**, Scotland Against Spin, and **Professor Iain McLeod**, Institution of Engineers and Shipbuilders in Scotland and the Scientific Alliance Scotland, gave evidence.

Q247 Chair: Good afternoon. I understand you have all come down from Scotland. Thank you so much for coming along to this Committee and giving us your evidence this afternoon. For the record, if we maybe go from left to right—and, Dr Constable, we will start with you—explain who you are and, just as long as it is short, make any brief opening statement to this Committee.

Dr Constable: Thank you. I direct a small UK charity called Renewable Energy Foundation that publishes data on the renewables sector. We have been very prominent in the last decade in revealing the extent and costs of the policies and calling into question certain features of those policies. We are a data-oriented organisation.

Q248 Chair: Thank you. Maybe just speak up a little bit too, if you do not mind, just for the benefit of the rest of the Committee, who are at the other end of this room.

Linda Holt: I am Linda Holt. I am a core team member of Scotland Against Spin, which is a grassroots alliance of local bodies, local organisations and individuals, and together we campaign for the reform of Scottish wind energy policy. We also offer support to anybody, more or less, who is fighting local wind applications. We have a vast amount of experience of wind applications in Scotland over the years.

I want to thank you very much for inviting me. We were delighted and surprised to get the invitation because the inquiry is very industry-focused, and it is the first time that the community view has been included, although it was not part of your official remit. We are very grateful for that because there is an irony that we are in England, giving the Scottish community view, whereas we have not had that opportunity in Scotland, which our members are very upset about. We feel in general that energy policy, especially renewable wind energy policy, has been conducted from the point of view of the industry and what the industry needs, rather than how it impacts on people and how they feel about it and what they want. We are grateful for the opportunity.

I think it is wonderful that you went to Orkney, but again that was very industry-focused about the projects that were in the offing and all that. It was not really a wind farm that is very typical for the majority of wind energy that is produced in Scotland, which is much bigger industrial wind farms where people are living, which people quite often do not like, and where they are in areas that are still being targeted by wind developers. I would very much like the Committee to come and see perhaps a more representative wind farm in Scotland in an area where people are suffering.

Q249 Chair: Thank you for that, and we are delighted to have you. I will just explain how this Committee works in case there is any misunderstanding. When we do have inquiries like this, we make sure that they are publicised wide and far, and we invite submissions from all sectors and individuals. I think we have received a number of individual representations on this, and we want to hear the views of everybody who has a stake and an interest in it. We are grateful to have you along today, Ms Holt.

Professor McLeod: My name is Iain McLeod. I am representing here two bodies. One is IESIS, that is the Institution of Engineers and Shipbuilders in Scotland. We are not shipbuilders, although we are proud of our maritime heritage. We are a multidisciplinary, professional engineering institution. I am the vice president of that institution and I chair its energy strategy group. The energy strategy group puts forward the principle that in order that energy can be successfully done, it needs to be planned, and I will explain that later. I also represent the Scientific Alliance Scotland, which is another independent multidisciplinary body, quite small, and it provides a forum for addressing environmental issues based on sound science. Neither of these bodies has any political or commercial affiliations whatsoever.

Q250 Chair: I am grateful to all of you for your brief opening statements. You represent a range of organisations that have given written evidence to this Committee, based on familiar themes I would like to explore and discuss with you. I am sure my colleagues will have lots of questions to ask you in response to some of the evidence that you have been giving. One of the themes that have come through in most of your written submissions, and other submissions that we have received from individuals on this, is security of supply and your concerns about intermittency, particularly in the onshore wind generation. Would you like to explain a little bit more your general concerns about that if you can, please, and tell us what you believe are the problems and difficulties we have here?

Professor McLeod: I am very pleased to do that. There are several issues in relation to the security of the system. We could say that security of supply means having enough generation to meet demand, and security of operation is having the right equipment so that the system does not go unstable, because if the system has problems with that it can go unstable and go down.

On the closure of Longannet in Scotland, we have been reassured by National Grid that there is sufficient transmission capacity to provide us with energy from the south when we will not have any sometimes because the wind cannot be guaranteed, but they did not say what the risk was that that would be unavailable from the south. There are significant problems with the issue, and one of the problems in closing down Longannet is what is called inertia. This is like the flywheel on your car; if your car

stutters a bit, the flywheel will keep it going. That is important for the stability of the system.

The National Grid last year published their 2015 System Operability Frameworks report. My power systems colleagues— by the way, I am not a power system engineer, I am a structural engineer but I work very closely with power systems engineers—tell me that this report is excellent, and the National Grid is proposing to do lots of all the things that it would recommend be done, but the report is not going to be out until 2018. Then we are going to find out whether or not it was really reasonable to close down Longannet. That is not the right way around. I am a structural engineer. Supposing someone came to me with a design for a bridge and they said, “I want you to ratify this design” and I said, “Well, let me look at the plans”, and it looks okay, and I said, “It needs some calculations done, but I do not have much time. It will be two years, but I will tell you what, sign it anyway and you can build it up” and—

Q251 Chair: I am grateful. We are just interested to get the views from all the panel if we can, but thank you, Professor McLeod. Does anybody else want to give us— yes, please, Dr Constable.

Dr Constable: The key to the security of supply question is recognising that a blackout is not the correct test of policy. It is cost of maintaining security of supply. We know the system costs in the UK are rising very significantly. The balancing costs have risen from a few hundred million pounds a year 10 years ago to roughly £1 billion a year at present. Rising costs of this kind indicate that the system is under stress. It is rising costs that tell you that something is wrong with policy. National Grid has access now, thanks to regulations, to very considerable instruments that will enable it to secure supply. In effect, Government have written a blank cheque on the consumer account to prevent a blackout. Blackouts can be prevented. The cost of doing so is promising to be very high indeed. It is the cost at present that really concerns us.

Q252 Chair: We find it very difficult to get figures for the various costs of the different suppliers. The last figure that I have available to me is from 2011 about the cost per megawatt that is the comparison with thermal generation, from renewables and from nuclear. They are all roughly about the same range. None of this comes free or cheap. Is there anything in particular about renewables that you have a particular issue with when it comes to these costs?

Dr Constable: All systems have a balancing cost, naturally, regardless of their constitution. Renewables come with the additional problem of the uncontrollable nature of their generation, so they have additional balancing costs that have been explored in detail by a very good paper published by IESIS, authored by Mr Gibson, former Power Networks Director of National Grid. In that paper he calculates the additional balancing cost per megawatt hour of renewables generation. It is many times that of conventional generation, so there is a considerable premium.

Q253 Chair: The figures we have from the Department of Energy and Climate Change is gas £55 to £110, onshore wind £80 to £120, and new nuclear at £80 to £105 as the range of the cost per megawatt of power. Are these figures that you are familiar with?

Dr Constable: Those are conventional generation costs. Is that capital costs?

Q254 Chair: These are the costs that we have per megawatt generation from the Department of Energy and Climate Change.

Dr Constable: The cost for balancing?

Professor McLeod: These figures will be for capital, operational cost and payment of debt, but there are obviously extra costs because they need extra transmission. You cannot close down the thermal stations because you need them to meet demand and you also need them to keep the system stable.

Dr Constable: The figures you have been given are what is called levelised cost and levelised cost procedure is notoriously inappropriate for renewables energy because of the uncontrollable nature of generation. Mr Gibson's work for IESIS examines exactly that point and discusses the flaws in using the levelised cost method for calculating cost to consumer. If that document is not available to you, I urge Professor McLeod to submit it.

Q255 Chair: Please make sure we get a copy of that, Professor McLeod. Ms Holt, do you have any views about the general intermittency issues that we are considering here?

Linda Holt: No, but I have a paper that I will also send you about total lifetime operational cost of different energy forms as analysed in Europe. Onshore wind and offshore wind in particular come out as hugely more expensive than gas-fired forms of generation. I agree with my colleagues that you cannot just look at the production of the unit of electricity in itself; you have to look at what the effect on the whole system is. The problem that we all have with wind energy is that it does not take into account transmission or the fact that you cannot shut down fossil fuel and nuclear power stations. You still need them.

Q256 Chair: We took evidence from the Committee on Climate Change—and this is still on the issue of intermittency—who said to us that they were quite confident that issues of intermittency could be dealt with. If we managed to get to a situation where we had sufficient backup capacity, interconnections, storage and demand side response, would these start to address some of your concerns about intermittency?

Professor McLeod: We are very concerned about intermittency because wind is extremely intermittent. What I was trying to get at there was that if you want to know about these things you want to calculate them before you make the decision. Making decisions about things before you have done the calculations is not the right way to go about it. You could not say that it is better to do the decisions first and then the calculations. Our submission to you was written by Sir Donald Miller, who is the foremost power systems engineer in Scotland, a world-class power systems engineer. He says that to achieve security of operation of an electricity system you have to plan it. You have to have a proper engineering plan and there is no other way you can do it. You have to plan it and if you want to plan it then you need to do it right and you need to use engineering methodology. I would like to explain that to you, if you wish.

Q257 Chair: If you have a paper that would probably help the Committee more. If you could make sure that is submitted so we can have a look, as a submission.

Professor McLeod: I can give you a paper. You don't want to hear about it just now. Is that it?

Chair: We have an hour so we are trying to get through as much as we possibly can and if you could do it briefly, would that be—

Professor McLeod: Yes, absolutely. The fundamental approach in engineering methodology is to reduce the risk. An engineer would reduce the risk by using a wide range of methodologies and would assess the efficacy of any proposal before you actually do it. We use what is called the design process where we identify all the issues and gather information. We look at options and we assess these options against the requirements. It works extremely well and people think Government planning does not work. It works really well. For example, the Forth Crossing is being managed extremely well by a Scottish Government body, Transport Scotland. You might say to me, "Well, what about Edinburgh Trams? That was awful".

Chair: If we could stay on the renewable—

Professor McLeod: I am sorry. I think I am telling you something important. Edinburgh Trams was a failure because—

Chair: Professor McLeod, sorry. We have very limited time. We have a range of issues we want to try to explore now we have you here. Could you please submit a paper to the Committee? Would that be all right?

Professor McLeod: I think I am leading up to a statement that is going to explain why you are in the position you are in just now with uncertainty for your investors. The reason that you have an uncertainty about investors is because you do not have a proper plan for the system. If the electricity system was properly planned then investors would have a lot more confidence in making their investments. Investors presently, I suspect, are unhappy about investing where, as someone said in the previous session, one Government says one thing, one says another. If you had a proper central planning system you would not have that.

Chair: We are very grateful for that explanation. Thank you Professor McLeod.

Q258 Mr Chope: Can I ask Linda Holt a question to start off with? You said that you welcome the opportunity that you have today and that you had not, as a representative of the Scottish community view, been able to put your view in Scotland. In what sense do you say that?

Linda Holt: We have put our view privately to Ministers and civil servants—this is to Scottish Government; it is different on a local level—but there is no opportunity to put it publicly because the Scottish Government are officially 100% behind renewables and have a view that there is very little opposition. There is actually huge opposition and the Scottish Government know that but they are very reluctant to acknowledge that or have any kind of public meeting. Fergus Ewing held an emergency summit for the wind industry after the UK Government announced their changes to subsidies and we asked for an emergency summit for communities who were also very affected. That was fudged and fudged and fudged because the last thing they wanted was to have crowds of people coming to tell

them how fed up they were. In the places in rural Scotland that are targeted by wind developers—the Borders, the Highlands, Ayrshire, Aberdeenshire, bits of Fife, bits of Angus, Perthshire, as you all know—people have had enough. They think there are enough wind farms now in Scotland; areas are saturated; applications keep coming. They get lied to by developers; impacts are much worse than they are told. When the wind farms go up they have very little redress to alter these impacts. There is a great deal of anger and disaffection in rural Scotland.

Q259 Mr Chope: Thank you. I hope we will be able to ensure that the other side of the case is heard. As far as the issue of intermittency and constraint payment is concerned, the transmission is regarded as one of the key elements here. Some people have given evidence—I think the John Muir Trust, for example—to suggest that the payments that are made where you cannot transmit are too generous, which then gives a perverse incentive to wind generators to increase their capacity. What do you think about that?

Linda Holt: That is obvious. Wind generators are not in the business of saving the planet. They are in the business of making money and they do not really care where the profits come from, if they come from constraint payments or being able to sell the electricity, and it is not their responsibility if the grid cannot handle the electricity. This is the problem of having a devolved planning system in Scotland where the Scottish Government have been allowed to wave through huge amounts of wind energy, which there is an inadequate infrastructure to deal with and it does not fit in properly with the rest of the electricity system. That has come because of the subsidies from Westminster and these two things should be integrated. In our submission to the Smith commission we proposed that energy should be undevolved, should be a reserved matter again because it was really something that worked. Everybody talks about the UK energy market. It is a single market and the energy system has to work for the whole of the UK. It is funded by all consumers and yet you have Scotland doing its own thing, passing lots of wind energy in a way that does not fit in with the rest, and that is why the subsidies are now being cut because the cost has been too great.

Energy is a fundamental good like security and the army. Defence is a reserved matter. We think energy policy should be a reserved matter. Not little turbines, not localised energy for communities, not the stuff off-grid, not all that little stuff, but the huge wind farms that are making the difference and that are having the negative impacts as well, not just on communities but on the entire system in terms of the amount of intermittent energy they are producing, should come under the say-so of Westminster not the Scottish Government.

Q260 Mr Chope: I would like your colleagues to comment on this next point. Those who at the moment are industrialising the landscape of Scotland are not contributing sufficiently towards the costs of the extra transmission that is required. Is that fair?

Linda Holt: They are not contributing at all.

Q261 Mr Chope: At the moment I understand only about 50% of the costs of new transmission are being borne by the generators. The rest of the cost is being borne by the national taxpayer and by the energy consumers.

Professor McLeod: Can I reply to that? You do not have a market. If you want wind energy it has to be subsidised, so if you ask the generators to pay for something else they will then want more subsidy, quite rightly, because it is not a market. They are not operating in a market.

Q262 Chair: All energy sourcing is subsidised. We were talking about the creation of Hinkley C at the cost of £24.5 billion. This idea that somehow there is an energy source that is free of cost is almost an absurd thing to try to suggest and assert.

Dr Constable: You are quite correct that in the present state of the market no technology is investable without some kind of subsidy. That is because of the distortion of the market that has taken place over the last decade. We have a situation where even combined cycle gas turbines are not investable; you have a seriously damaged market. This is a fundamental in economic technology. If it is not possible to get a return on capital by investing in combined cycle gas, then you have a problem, so what has happened—

Q263 Chair: But just on that, so we do not lose this, Professor McLeod was talking about investability, about the confidence of people investing. We are hearing about Hinkley, for example, that EDF is considering pulling out because it is uninvestable because of the costs, so surely this is not something that is singular to the renewables sector. There are issues with all energy generations.

Professor McLeod: You are absolutely right. It is not just the renewables. That is why you need to have a properly engineered system so that you can then deal with all these matters. Every method of generation has its good points and its bad points, and we are heading for a state in which they are all going to need to be subsidised.

Q264 Chair: Just before we lose this, Ms Holt raised very important issues about communities and locality and I know that a couple of my colleagues looked to see if they could ask a supplementary question. I will come back to you Mr Chope, if that is all right.

I represent an area where there are really large wind farms, probably more so than any other constituency in Scotland. I have Calliachar, Griffin and Ark Hill. Can I say to you as a local Member of Parliament, for 15 years, that these are remarkably supported now because of the funds that have been given to the communities? Aberfeldy has practically been transformed by some of the benefit it has seen from having a wind farm by its side because it has been able to invest in some community projects, as have Dunkeld and Alyth. I think the characterisation that local communities are unsupportive of wind farms, particularly when they are there, is not particularly accurate, not in the experience that I have had from Perthshire.

Linda Holt: Mr Wishart, do any of the communities that you represent want more wind farms? As far as I know there are quite a few proposed around you and there is incredible opposition to them. Perth and Kinross Council keep on turning them down. People think there are more than enough turbines up there and that is the awful thing with communities. People think they want to do their bit for saving the planet but it is never enough. The developers come back for more and more.

Chair: We will have a conversation about planning and obviously, by your response, your dissatisfaction with the way the planning process assesses projects. We will do that but I just wanted to make sure that we were not misunderstanding each other about the communities that live with wind farms now because that, certainly in my experience as a local Member of Parliament, is not accurate in terms of the support the local communities now have when these wind farms are up. We will come back to planning and I know that you have really strong views on that, but Kirsty Blackman and Chris Law wanted to ask a question.

Q265 Kirsty Blackman: The village that I live in is surrounded by wind farms and we are going to be getting another one and the community are delighted because they are looking forward to the money it is going to bring. I have spoken to so many people in the village about it and they are happy about it. I have not spoken to people who have said, “Oh, it is terrible that we are getting these wind farms and we are going to get all this money for our community.” I appreciate that you are putting forward a view that some people feel but I think it would be important to be careful about saying everybody feels that way because I think it is a small majority who are very vocal.

Linda Holt: No, I really don’t think it is. We have 4,500 registered members. We go to SNP conferences and we have delegates coming up to us saying, “We have had enough”. I think quite a lot of people have given up talking to their SNP Members of Parliament or MSPs or councillors, although councillors are very sympathetic and you will know that, that the councillors in local authorities have also had enough and they are refusing more and more things—

Kirsty Blackman: Not all of the councillors in local authorities; some of them.

Linda Holt: Not all of them but I am saying it is now a majority and we have seen that change, if you just look at *The P and J* today.

Q266 Kirsty Blackman: I am afraid that the language you are using is giving an impression that people all feel like this and councillors all feel like this. Some councillors feel this way and some people feel this way.

Linda Holt: I have to say that I cannot think of a single big wind farm development that has recently gone through in Scotland where a community is largely, 70%, 80%, 90%, in favour. I cannot think of one.

Q267 Chris Law: I was just about to say I could give one. I live in Dundee, which probably has the only urban wind farm in the UK, which is the Michelin plant and—

Linda Holt: Yes, but that is not a recent one. That was a few years ago, wasn’t it? And that was attached to jobs in Dundee.

Chris Law: It was. In fact, it saved the plant, which is nearly 1,500 workers.

Linda Holt: So it is not surprising that that one went through.

Q268 Chris Law: No. I could give you some examples of the kind of things that were said at the time about people getting headaches and sore fillings and various other things and having TV disturbances, but generally what it did was enabled the factory to be protected. In fact, this year we had a £52 million investment, which means 15 years going forward. I think in the spread, in the mix when you are talking about developers, there is a range of developers as well. I wanted to say when you are speaking about developers, are you talking about largescale developers or are you talking about community-owned developers? What kind of developers are you talking about?

Linda Holt: I am talking about largescale developers and there are quite a few largescale developers who characterise themselves as community developers and they are nothing of the sort. They have just used the label.

Q269 Chris Law: Just to explore that for a second. The one we went to in Orkney had 69 owners within the development. We went to Hammars Hill in Orkney and the person we spoke to there had 69 people included in that community, so it was embraced by the people in Orkney. Is that the kind of thing you want to see going forward?

Linda Holt: Yes. If a community wants it, especially if it is off-grid and it is struggling, fine, completely support it. That model may work in Orkney and in other far-flung places. It does not work when it is really big developers coming in simply to make as much money as possible by mopping up the subsidy to bits of the central belt or bits of the Highlands. It is just not working.

Chair: I think we have explored that and we are back to Mr Chope, who I believe still has some questions.

Q270 Mr Chope: Your argument really is that Scotland is already self-sufficient in renewable energy and it should not be generating a lot more renewable energy at the expense of the Scottish environment in order to supply other parts of the United Kingdom. Is that what you are saying?

Linda Holt: Hopefully some of these little localised schemes are self-sufficient and are doing good. That is fine, but that is not really what we are talking about. The mass of wind energy that is produced is exported to England. It is not used in Scotland. There was a recent analysis done of the interconnector between Scotland and England that showed that when Scotland was producing lots of wind it did not need the energy and it was all being sent to England or being constrained off, so in effect, Scotland has become a giant wind farm for England.

Q271 Chair: Just a minute—I am the Chair of this Committee, and I think we have to clarify this—

Linda Holt: Sorry.

Chair: You will have seen the figures last year that 57.7% of all electricity in Scotland was produced by renewables in 2015. Do you recognise that figure?

Linda Holt: Possibly. I am not sure. But it was not the electricity that was actually used in Scotland. It might have been electricity produced in Scotland, generated in Scotland, but it was not the electricity that was consumed in Scotland.

Q272 Mr Chope: Going back to this issue of transmission costs, I think the evidence from the John Muir Trust is that the cost of putting up a new transmission line across the Cairngorms from Beaulay to Denny, originally estimated to cost £350 million, ended up costing the best part of £900 million. Can you explain why that happened and who in the end is going to pay the bill for that?

Professor McLeod: I am not involved in the Beaulay-Denny line so I could not tell you why the cost went up but I would say that the transmission is being planned—we do not have a plan. I am sorry I keep coming back to this idea of a plan but it is very important. If you are making a plan for an electricity system, I would have thought that you would want to start by working out exactly where the plant is going to be and then working out how to connect them up. The Beaulay-Denny line was built way ahead of any kind of decisions about what the plant would be and whether it was really needed is not sure, because at the time there was a lot of dissent suggesting that there were better and cheaper ways of doing it.

Dr Constable: Could I add something on the grid system? Expansion of the grid will reduce constraint payments in Scotland and that would be desirable, would be some kind of remedy for it, but one should not be under an illusion that it would be cheap. It might even be more expensive than paying wind farms to stop generating. The electricity consumer has to pay for extensions to the grid. National Grid has a regulated income and regulated asset base, so the consumer would be charged for any extensions of National Grid's assets. In fact, the ones in Scotland would not be assets of the grid, of course. It operates the system but does not own it. Extending the grid system will address many of the problems of intermittency but it will not be cheap. The cost to the consumer, roughly speaking, for a grid asset is somewhere between 7% and 10% of the capital cost for the life of the asset, say 20 to 30 years. This is a very expensive remedy.

The point really is, going back to the point made to you by the CCC: can you address these things? Yes, indeed. Engineers can do many remarkable things if you are prepared to pay for them. Bus service to the moon? No problem, provided you are prepared to pay for it. The remedies are expensive and you can see that from the cost overrun that you have just mentioned in relation to that particular grid extension. The grid extensions to address Scottish intermittency would not stop in Scotland. They would have to come far down into England, so the overall system costs will rise very substantially. It is arguable, although not known, that it would genuinely be cheaper to constrain Scottish wind off, even at the excessive prices that are currently being demanded, than to pay the costs of integrating it.

Q273 Mr Chope: What about reducing the actual constraint costs, in other words reducing the amount that is paid where there is constraint?

Dr Constable: I think that is a matter for Ofgem. I have written to Mr Nolan at Ofgem pointing out that the compensation asked for by wind farms in Scotland for lost income is greater than the income they are losing. In fact, they make more money per megawatt hour when they are not generating than when they are. I think that is wrong. I do not see that they really need to charge somewhere between, on average, £60 and £70 a megawatt hour

for being constrained off when they are only losing £45. Indeed, some wind farms charge a great deal more than that. The constraint payment costs are in excess of lost income. I do not see why that should be so. To my knowledge, no economic case has ever been made explaining why they should be taking a premium of that scale and I am surprised that Ofgem has not been able to intervene more forcefully to protect the consumer.

Q274 Margaret Ferrier: Ms Holt, we have received some evidence from various people raising concerns about the impact of onshore wind in particular and you have already told us about how your communities and some of the people you are dealing with feel. The issues around property prices, I think you have mentioned, and the harm that can be caused to the environment. However, a recent poll by Scottish Renewables has shown that 70% of people in Scotland are in favour of renewables. I am wondering how that ties up with the evidence you have, because obviously we are interested in hearing. We have already heard about Orkney and how the chairman of Hammars Hill has said it depends on where you site a wind farm. It is to do with the right location and the right environmental conditions. Why have the people of Orkney bought into it? Is it because they see community benefit, community ownership? Surely we have to see a way of ultimately tackling greenhouse gas emissions and climate change. If you look at the Department of Energy and Climate Change here, it is quite keen to promote shale gas but we have not seen anything similar when it comes to renewables.

Linda Holt: Shall I start with the poll showing that 70% of people want more renewable energy? That is absolutely not the same as people supporting onshore wind or 70% of people wanting more wind farms. Everyone wants more renewable energy if renewable energy is free, endless, clean, going to save us all. Who wouldn't? What is not to like? But as soon as you say to people, "Well, this is the renewable energy we are talking about. It is this form. It is going to have these impacts. It is going to cost this much" you get a very different answer, so I do not think that that statistic proves anything at all. Most of our members would say yes to renewable energy, except they all now know more about energy. They would say, "Yes, but what if, and how is it going to happen?"

I would like to challenge the Scottish Government or the wind industry to do a poll that asks people in rural areas if they want more wind turbines in wild or rural areas in general or in their neck of the woods in particular. I think if you did that in Scotland—and this is the reason none of them has done it and won't go near it—you would get a resounding "No", that they have had enough, so I do not think that that really proves anything. I realise that some of you live in areas with wind farms and you hear from constituents who like them, but our experience is that as people are forced to live with wind turbines and they learn more about them, they become more opposed not less opposed. Our membership is growing. Opposition is growing in Scotland. It is not going down.

Q275 Chair: Can I stop you there? It is fair enough to give evidence and we are interested in what you have to say but you are starting to characterise again something in—

Linda Holt: But this is our experience.

Chair: I do not know where you are from, Ms Holt, but I am from Perthshire where we have large wind farms and to suggest to this Committee that there is somehow wholesale opposition to these wind farms that lie adjacent to communities just is not right. There is no evidence that suggests or says that. In my experience, and again it is only anecdotal, what I have found is big buy-in to these wind farms because what they are seeing is—as Ms

Blackman said about the proposed wind farm in Aberdeenshire—that that has immense benefits, financial benefits given that has helped to regenerate some communities. Aberfeldy is a transformed community because of some of the funds they have been able to secure from the Griffin wind farm. To try to say that communities are opposed—

Linda Holt: But why are there so many objections to wind farms then? There are tens and tens and tens of thousands of objections, and people do not change their mind and decide they like them. They end up objecting more. It is incredibly difficult to—

Q276 Chair: I accept totally that when wind farms are proposed there are massive amounts of objections that go into that. Of course. What we do in that situation is allow the quasi-judicial process of planning to determine whether wind farms go ahead, based on objections and based on what local communities have to say. But what I am taking objection to, and why I am having to pull you up again about this, is your suggestion, your assertion that when communities have wind farms adjacent to them as communities, that there is a difficulty, a problem and there is hostility and opposition. That just is not the case. There is not any evidence for that.

Linda Holt: There is plenty of evidence. We can send you the evidence.

Chair: Right. Well, please do.

Linda Holt: I can send you, find you evidence in your own communities. The people may not be coming to speak to you. The people who get the community benefit are, of course, going to be very happy and they will be the ones in the community councils or whatever, or various institutions, who are speaking to you and who are appearing in the paper, but lots of ordinary people will be unhappy. Worse than that, there are people who live near the wind farms that you have talked about who are suffering ill effects. They are suffering from noise and health impacts and they can get no redress.

Chair: Okay. We will need to see that evidence because obviously this is an evidence-driven inquiry. Please, if you have evidence of communities who live next to wind farms who are unhappy, who have these range of things, this Committee would be very interested in that.

Q277 Mr Chope: Chairman, we have some evidence already, from the John Muir Trust that refers to the Wester Balblair electricity substation near Beaully, “Residents around that, as far away as two miles away, can’t sleep because of the noise. Despite the siting, scale and design that was consented, having been justified by developer’s assurance about noise impact, the Highland Council had to serve an abatement notice and the problem continues”. So we do have evidence about the unpopularity and inappropriateness of some of these developments.

Linda Holt: I am sorry. You said about community benefit and getting people to buy in to wind farms. There are places where that happens but in general that does not happen. Community benefit is a drop in the ocean compared to the actual revenue that wind farms earn. It is a tiny amount of money. Communities know that. They know it is a pathetic bribe. It gets termed “beads for natives”. I have been on a number of community liaison forums and I have seen this. The developers come in and they think the community is going to be terribly grateful that they get this tiny bit of money but the communities know

what is going on now. It does not work. Even community ownership they are very suspicious about and they feel bought off by.

Q278 Margaret Ferrier: Just a last question then. Is Scotland Against Spin completely opposed to onshore wind farms or is it to do with location?

Linda Holt: On a policy level we are opposed to more wind energy because we think it has wrecked the electricity system and that it is simply too expensive and it has not been planned properly. There was never a proper national strategy about it. In fact, we were never supposed to have this many onshore wind farms. I do not know if you know that when they set the 2020 renewable targets for 100% renewable electricity generation in Scotland they did not specify the type of generation and in fact—I have been told this by senior Ministers—they thought that most of the renewable electricity would be generated by offshore wind. That is what they believed. That did not happen for various reasons, which in retrospect were quite obvious—it was not going to happen because the conditions are so harsh and it was going to be a lot more expensive and a lot more difficult. The Scottish Government never thought when they set that target that there would be that many onshore wind turbines, but because they needed to fulfil these targets and the subsidies were on offer and they had a very permissive planning policy they let the onshore developers come in. The belief was that—and I was told this by Fergus Ewing—the onshore wind development, even though it was not really what was wanted, would encourage further investment and encourage offshore. It would also encourage improvements in the grid and transmission that were necessary to kick-start offshore. It was a kind of gamble that has not worked.

Q279 John Stevenson: Interestingly enough I am the Member of Parliament for Carlisle, which is Cumbria, and your view, your comments about opposition is something that I have certainly experienced in my area. I think there is a lot of opposition to onshore wind farms, which leads me into the planning process. In the experience of my council, the local councillors, as representatives of the local people, invariably rejected onshore planning applications but one or two that did go through were by appeal. I know this is a Westminster-based Committee and clearly planning is a devolved power to the Scottish Parliament and to the Scottish local authorities, but nevertheless it is very relevant to our inquiry. I just want to know what your experiences are of the planning process within Scotland and whether the communities have been properly heard, in your view, and what the relationship is between the councillors and appeals and so on with regards to applications for onshore wind farms?

Linda Holt: I think people in Scotland now are very envious of people in England where the community veto has been brought in. If a local authority refuses a wind farm, that is where it stops; it cannot be overruled. In Scotland developers budget for the appeal. They expect to appeal. They now expect the local authority to refuse the wind farm. They used to try much harder—

Q280 John Stevenson: Sorry to interrupt; I am conscious of time. In your experience are the local authority planning committees rejecting the planning applications and they are being passed by appeal or are they being passed by the local council? I would argue that a local council is the representative of the local people and if its planning committee is passing those applications then it does seem legitimate.

Linda Holt: No. I would say that local committees are increasingly refusing them because they basically think they have enough in their area, but there is pressure on local councillors not to refuse applications because if it goes to appeal it can cost the council money and they can have costs awarded. Quite often they know that even if they refuse it and they think they have good grounds, it is likely to be refused on appeal because national planning policy very strongly favours more onshore development.

Q281 John Stevenson: What you are saying is that the national planning policy is being followed?

Linda Holt: Yes, so the councillors are trapped.

Q282 John Stevenson: Okay. That is fine. Therefore, would you advocate a similar policy that which we have in England whereby a council is the final arbitrator of the decision?

Linda Holt: Absolutely. But the other problem we have in Scotland is we that have a very large number, which you do not have in England nearly as much, of these very large wind farm applications over 50 megawatts that are determined directly by the Scottish Government and there the local authority can just express a view but can't do anything.

Q283 John Stevenson: Okay, but at these planning meetings one assumes that local communities and an organisation such as your own are heard. You get your opportunity to put your argument forward.

Linda Holt: People can make objections but they are just ignored. That is why there is so much anger. There is no local planning democracy and as a result of—

Q284 John Stevenson: But are they ignored? That is what I am trying to get at. Are they ignored or are they being supported by the local council?

Linda Holt: Some local councillors, yes. I am saying that the local councillors are beginning to listen and they are beginning to refuse applications but it is not enough.

John Stevenson: It would be good hard evidence for this Committee if you were able to produce a number of applications that had gone forward; those that had been rejected by planning committees and those that had been supported when they went to appeal. Do the other two gentlemen have any observations or comments on the planning system?

Chair: If it helps, John, we did receive evidence from COSLA, the Convention of Scottish Local Authorities, who talk about significant opportunities for local communities when it comes to some of these developments. Where there are objections, the local authorities take a view where these things are considered and there are opportunities that are also explored for local communities.

Q285 John Stevenson: Do the other two gentlemen have any views?

Dr Constable: I have one point that occurs in my own evidence on this matter, which is that planning decisions taken in Scotland are costing English and Welsh consumers money.

This is potentially politically very explosive in the longer term. If the Scottish Government consents a wind farm it is not electorally accountable for that in one sense because the electricity consumers' bill impact is felt over the whole of the United Kingdom. That seems to me to be an accountability problem of quite considerable margins. The reason why developers are continuing in Scotland is because they detect a favourable planning environment. In fact, there is more than sufficient renewable capacity now consented to overshoot the 2020 electricity component by a very large margin, 35%, so there is no planning argument to persist in consenting wind farms in Scotland, or indeed anywhere. Really it should stop in order to fall within the levy control framework budget. Not only would the target be overshoot but so would Treasury's budget, which is £7.6 billion in 2020, and the overshoot could be anywhere up to £10 billion on present estimates.

In an earlier question to the previous witness, you asked whether he detected any signs of slowing down in the industry. The answer I would have given to that was, "Well, there has to be because otherwise the budget is going to be overshoot by a very large margin". The Scottish planning process is not assisting. It has not yet recognised that there are cost implications for the decisions that it takes and some kind of central instruction has to be given on that.

Q286 John Stevenson: Is this a problem of following energy policy that is UK and a devolved power to the Scottish Parliament?

Dr Constable: There is a curious mismatch between the fact that energy is a retained power and yet planning is devolved on this point.

Q287 John Stevenson: Would you suggest for energy issues that the planning should come under the UK? Well, we can't change it anyway, but there has to be some sort of logical rearrangement of what we are doing.

Dr Constable: There are two ways of making it consistent. The other way of making it consistent is to give energy to the Scottish Government but also to transfer responsibility for financing that energy policy.

John Stevenson: Exactly the point that I think Chris Law was just—

Q288 Chris Law: I was just going to come in on that point. You raised the point that it is costing the rest of England and Wales for the renewable development in Scotland. However, is that not the same case with the cost of Hinkley Point in the south of England that is going to cost the rest of the UK, which includes Scotland?

Dr Constable: The cost would be socialised, and for the record, by the way—

Q289 Chris Law: That works two ways then, right?

Dr Constable: I disapprove of subsidies to Hinkley Point very strongly. I think they are quite wrong. I do not agree with subsidies to any technology at this point. My point is that the subsidy costs are socialised at present. In the event of an independent Scotland, what would happen? Would English and Welsh consumers continue to subsidise generation plant in Scotland or would Scottish consumers then be asked to find that subsidy itself? It

is an interesting and open question. Similarly, if plant is built in Scotland, passes through the planning system without some kind of accountability issue—so, that the Scottish Government consents a plant but the cost is paid for outside Scotland—that is a problem.

Q290 Chris Law: Dr Constable, my original point is that works both ways, doesn't it?

Dr Constable: Yes, but Scottish consumers are a relatively small fraction. They are about 10% of all of them, so all the costs are socialised. In the event of an independent Scotland I would hope that subsidies paid to English and Welsh generators would not be charged to Scottish consumers.

Chair: I think all of us remember during the independence referendum being told that the support for some of the renewable industry through ROs and CfDs was protected within the confines of the United Kingdom, only to find within two years that these renewable obligations had been taken away. Again, there were certain things said in the referendum when that debate was happening.

Q291 Maggie Throup: Sorry, Linda, this is another question for you. Apologies that you seem to be getting all the questions in this section. The Convention of Scottish Local Authorities and Community Energy Scotland have told us about some of the benefits that the locally-owned renewable projects can have for communities. Your evidence argues that some of the benefits that many community funds are getting are not really as significant as they could be. I am sure there are some good examples and some examples that are not as good. Can you give us a couple of examples of where the community benefit for the locally owned renewables has either been good or bad?

Linda Holt: Mr Wishart has given you an example of where he thinks it has been good in Aberfeldy, although I think probably Aberfeldy has had more than enough money, has it not, by now? The money keeps on streaming in and there are other communities that could really do with it. One of the problems is that you have some little communities—I think Dalmellington is another one—where they have had a lot of development and they get lots of money and they just do not know what to do with it anymore and it really needs to be spread around. The community benefit needs to be spread around.

Q292 Chair: Having too much money is not a problem for communities.

Linda Holt: Yes, but if you are trying to govern a country and you can see that you have an area of great deprivation and another one that has far more money than it needs, it is not a very satisfactory state of affairs. The way that community benefit ends up being distributed is very haphazard. There is no proper regulation of it.

Q293 Maggie Throup: There is no particular plan so that it can—

Linda Holt: No, and quite often it gets frittered away on sort of daft things rather than on sustainably helping a community.

Q294 Maggie Throup: Can you give me examples of some of the daft things that it has been frittered away on?

Linda Holt: I will have to give you some written evidence, but taking old age pensioners out for a slap-up meal for thousands of pounds is one that recently occurred in Fife in an area of multiple deprivation. This particular development trust that receives money from the Little Raith wind farm is now under investigation from the Charity Commission because of breaking various rules and there is nothing that can be done. The money gets used by local politicians to big themselves up, basically, and it is very irritating for people and it is very divisive. I think there should be community benefit from these big renewable developments because people are having their immunity compromised and the developers are making huge profits, especially when they have the very lucrative renewable obligations contracts, but I think that the benefit should be in the form of a windfall tax and that should be spread across the country.

Dr Constable: Can I offer a few more remarks on community benefit in relation to subsidies?

Maggie Throup: Yes, please.

Dr Constable: I can give you some numbers that might help. You have to remember these benefits are not just being conjured out of thin air. They are coming out of people's bills elsewhere, so some thoughts about the numbers. Subsidies to renewables in the UK overall at present, all technologies, are costing about £4 billion a year. Roughly half of that is going to wind and slightly over half of that is going to offshore wind and slightly under half to onshore wind; something like £800 million, £900 million to onshore wind. The bulk of that is going, of course—as you can see from the numbers in my own evidence to you—to onshore wind properties in Scotland; somewhere in the region of £600 million, £650 million a year. This is quite large money. This is not small money; it is quite large money. The community benefits in proportion to that total subsidy income. Remember their overall income is roughly twice that since half the income of an onshore wind farm comes from subsidy.

The rates of return on these sorts of sites are very high. They can easily afford these community benefits but where is the money coming from? It is being levied on electricity bills through the United Kingdom, regardless of the person's income and wealth remember. This is a regressive tax so these community benefits are being paid out of regressively levied taxation. Methodologically, I think people in Government might wish to reflect whether that is a very equitable way of proceeding. Just because there are benefits within those communities where they are receiving it does not mean to say there are not harms elsewhere in the economy. You must take a macroeconomic perspective on this. Is the net effect positive? The gross effect within the communities receiving the community benefits doubtless is positive. Is the net effect over the whole of the United Kingdom—

Chair: I am going to have to stop you there, Dr Constable. We have a Division in the House. We were hoping to get the session finished before this Division happened, but obviously your evidence is so interesting to the Committee that we have a good few questions that we would still like to ask you.

Sitting suspended for a Division in the House.

On resuming—

Q295 Chair: Could I ask everybody just to resume their places if they do not mind and we will see if we can resume this session, if that is okay. Sorry, gentlemen and lady, the natural consequence of democracy is that the Division bells could go any time. We are all concluded now so there will be nothing until 7.00 pm—but hopefully we will be long concluded by that point.

We left a very interesting question from Maggie Throup, so if we could just resume from there.

Maggie Throup: Dr Constable, I was quite interested in what you were saying. Could you just recap what you were saying before the Division bell went?

Dr Constable: Yes, quite. We were talking about the community benefits and where they are coming from. They are coming from subsidies, obviously, and the scale of those subsidies is an orienting point I think. I pointed out that there is £4 billion a year in total at the moment. About half of that is going to wind, slightly under half of that is going to onshore wind, and nearly all of that is going to onshore wind in Scotland. It is something like £600 million to £700 million a year, so this is a very well-funded industry. Rates of return are very high for investors in this sector and they can easily afford these community benefits.

The community benefits, of course, come from electricity consumers' bills elsewhere in the economy. You have to ask yourself whether the net impact of the community benefits is actually positive. The gross impact in Scotland is going to be positive of course, that stands to reason, but you have cause and effect elsewhere in the economy through the subsidies. The subsidies are going to be increasing costs for all consumers, low income people and high income people. There will be an increase in the cost of living throughout the United Kingdom and they will be reducing wages and rates of employment elsewhere in industry.

There are very broad economic impacts. The community benefit is not free, is my point. One should reflect on that and ask yourself whether you are confident that the net benefit is actually positive.

Q296 Maggie Throup: Just to extend that a bit further, if so much subsidy is going to wind and obviously the population of Scotland overall is quite a small percentage, have you done any work on pro rata how much more per head of population the subsidy is?

Dr Constable: The subsidy costs at the moment are socialised over all UK consumers, so it is not disproportionate to Scottish consumers at present. There is a question, of course, whether in the future that would have to change and the question is whether the Scottish economy could support subsidy levels of that kind without considerable pain.

Q297 Maggie Throup: Professor, I saw you put your hand up. Did you want to add something?

Professor McLeod: Yes. I want to talk about cost in general. The cost of renewable energy is something we are not very clear about. As we said earlier, it is not just the cost that you

pay to the generators. We have been pressing the Government in Scotland and in Westminster to do the costing properly. They have commissioned a study and it is on what they call whole system costs and that will give some idea of what they are really going to be. Why would you not want to know what the costs are and why would you not want to work out the costs before you invest in these things?

Q298 Chair: Surely once the plant is established and is in place the costs are going to be almost negligible because it does not cost anything for the wind or the tide to come in?

Professor McLeod: I am sorry, but that is not true, absolutely not true. You are going to need to have two systems where previously you had one; because of the intermittency of wind, you cannot close down much of the thermal generation and if—

Q299 Chair: We have been told again that the intermittency issues will be addressed and there is confidence that these things can be resolved. So if we address the intermittency issues—

Professor McLeod: But only at a cost. It can only be resolved at a cost.

Q300 Chair: Once all the costs are established and in place and intermittency is dealt with, as several witnesses have told us that this could be addressed and could be resolved, and the plant is established, what are the ongoing costs?

Professor McLeod: You are going to have two sets when you needed one. You are going to have a set of wind generators that will cover the whole of the demand if they were running, but because sometimes none of them run you would need another set that will do it when they are not running.

Q301 Chair: But that is if intermittency issues are addressed and dealt with and we get close to—well, Scotland's target, for example, is all of the electricity produced by 2030. If that is achieved and secured, and again we have been told that intermittency issues can be addressed and possibly resolved—nobody has said they will be resolved but possibly resolved—all the plant is in place and it has all been established and paid for, I am still struggling to see what the cost would be.

Professor McLeod: It takes a while to pay off a cost and the cost of a wind generator has to be paid off in 15, 20 years whereas other plant can go to 40 years.

Q302 Chair: What about a nuclear power station?

Professor McLeod: They go for 60 years. That is why a nuclear power station is not a very good investment in the industry because you need high costs in the beginning and you do not get your returns for many years.

Q303 Chair: So what do we develop then? If nuclear power is excessively expensive, we are hearing from the three of you that there are huge costs associated with renewables, the days of coal-powered generation are surely over given the global concerns about global warming and the Paris agreement and all the other international treaties, what are we going to power the country with?

Professor McLeod: What I am saying to you is that you have to have a plan and you look at all the options and you work out what each option is going to cost.

Q304 Chair: You have thought about this, so what is it? What energy will we be powering this country on? You have spent ages explaining and defining your view about this.

Professor McLeod: You can have gas, you can have nuclear, you can have renewables, and you want to see what is the mix of these that is most suitable. Why would you not want a plan and work it out first?

Q305 Maggie Throup: I have not quite finished, so still on the community benefits, some of the information we have had has indicated that the greater benefits that are derived from the local ownership of renewables dispel some of the concerns about the renewable schemes being located in their areas. Do you think that is true?

Linda Holt: Well, it depends. The Scottish Government have been a little bit sneaky when they talk about their figures for community locally-owned renewables because by locally-owned they mean local land owners. It does not mean some local community group or something. It just means it is not one of the really big developers, because there is very little genuinely community-owned renewable energy in Scotland. There is a certain amount through the feed-in tariffs and a little bit through ROCs of local land owners with one or two turbines or small wind turbines.

Maggie Throup: Who have half a dozen turbines.

Linda Holt: Those do not command more acceptance. Neighbours get very cheesed off that they have to suffer the negative impacts of the turbines while the farmer next door gets all the benefits. No, that does not really work either. You have terrible division in some communities where this has happened.

Q306 Maggie Throup: It is not quite which side of the fence you are on but whether you are the land owner or the local resident as to whether the benefits are there.

Dr Constable: Can I comment briefly on that? I would not expect much expansion in the scale of community ownership in wind. We must remember that this is a high risk technology from an investment point of view and it is derisked by subsidy from electricity consumers. There is a risk that those subsidies will be withdrawn, possibly even retrospectively and retroactively through windfall taxes.

So this is quite a high risk sector. Major institutional investors know this and, of course, major institutional investors can lay in for that, they can plan for it and offset it. Small investors probably are not able to take on that kind of risk. Well-advised local communities

would probably not wish to get involved very deeply in such projects because it is so high risk and those that do are taking on quite considerable risks.

For those reasons, I think people will be sensible and you will not see much expansion. The exposure for local communities will be quite shallow, quite limited.

Q307 Chair: Can I just ask the question I asked Professor McLeod? We are hearing from your various contributions that you have an issue with new nuclear generation, and you obviously have massive issues with the cost of renewables. Given that we are not going to go back to carbon generation in the future, given all the treaties we have signed up and all the international arrangements and agreements, what in your view are we going to power this country with?

Dr Constable: Well, are we not going to go back? I would not bet against distressed policy correction.

Q308 Chair: Do you seriously think we will go back to carbon generation?

Dr Constable: It is entirely conceivable. You must remember that we do not have a low-cost, low-carbon solution at present and the costs of nuclear are uncertain. The Hinkley subsidies tell us nothing about the fundamental economics of nuclear generation. All it tells us is that it is not viable in the current distorted market. It is heavily distorted by subsidies to renewables. As I have said to you, even combined cycle gas turbines are not fundamentally investable at the moment; they need subsidy payments through the capacity mechanism. That is not their fault.

Q309 Chair: Is it your view that we are going to go back to burning carbon fossil fuels?

Dr Constable: I am certain that we will need to build combined cycle gas turbines. That is what the capacity mechanism is there to do. It is to provide firm dispatch for the plant that can guarantee security of supply on a cold, dark winter's afternoon.

Q310 Chair: Is this a view generally shared across the sector that has the biggest issues to do with renewable energy, that at some point we will go back to burning fossil fuels?

Professor McLeod: It is not quite as simple as that. There is no option but to keep on burning them because you need to back up the system that cannot do it on its own.

Q311 Chair: But have you absolutely no concern? Do you not accept the whole premise of global warming and the need to control temperatures? Does that not feature in any of your thinking at all?

Professor McLeod: I am not making any statement about that at all. I am just saying that if you want to achieve your options you have to work out what it is going to cost.

Q312 Chair: Can I ask you directly, Professor McLeod: do you have concerns about global warming? Are you worried and anxious about the idea? Is the Paris agreement that all nations signed up to wrong in your view?

Professor McLeod: I believe that there is a risk in relation to global warming, but it is not very well quantified and it is sensible to do something about it but it is not sensible to do something about it if it is going to cost a lot more than the cheaper methods of doing it. Are you prepared to pay anything to decarbonise? There must be a limit.

Dr Constable: What we have is a cost-insensitive climate policy and the willingness to pay of British consumers will be tested to the utmost by that. The cost per tonne of abating CO₂ under the current policies is extremely high. For onshore wind it is something like £100 a tonne and this is many times in excess of what is paid through the EU emissions trading scheme. For solar it is something like £1,000.

The important thing about that is that the European Union emissions trading scheme not only guarantees the emissions saving within the European area but it also caps it. This is not understood very widely outside economic circles. The savings on the ETS are capped, so the renewables obligation, the feed-in tariff and other policies do not add additional savings to that level. What they do is they force the market to substitute a high-cost emission saving for a low-cost saving. What you have at the moment is an extremely high-cost climate policy that may well fall foul of consumer resistance. It is a very good idea to reduce emissions; it is a very bad idea to have a very high-cost system that is likely to fall foul of consumer resistance.

Q313 Chris Law: I am quite troubled by this afternoon's discussions. Sitting here as a quite recently elected MP, my concerns are my constituents and not just my constituents but those across the planet as well as Scotland and the UK. Surely it is not just about costs, not in the near term. Do any of you have any projections what costs would be if we did nothing, in other words if we exceeded the 2% targets? I know we were talking about the cost per megawatt just now but my deep concern is when I go back to my constituents and I say, "We are going to keep rolling back against renewables in favour of gas, gasification, using gas energy, and there may be risks to global climate change". What would your answer be to them if they say, "What are the costs of us not supporting these industries for renewables?"?

The second thing, just to add to that, is we have focused a lot on onshore wind. We have wave and tidal and offshore, and of course we have had renewable energies around for quite a long time, particularly with hydro. What kind of mix would you like to see in renewables as a spread?

Professor McLeod: As I said before, I do not know what the mix should be but you would need to do the sums.

Q314 Chris Law: Has anybody here done the sums then?

Professor McLeod: This is a fundamental problem. In engineering we can do calculations that predict what the future is going to be for these particular things.

Q315 Chris Law: But we do know that climate change is underway and that is why these treaties have been signed. Still trying to work out what these sums might be while the planet gets warmer, going back to your original argument, what goes first?

Professor McLeod: What was your question?

Chris Law: My question was, we are talking very much about the cost, the very near term costs, the setting-up costs, the establishment costs, even the service and maintenance, but I want to know what the costs are of doing nothing, in other words if we continue to use carbon rich energy sources, and what the cost would be globally?

Professor McLeod: You could not really work that out because you do not know when it is going to happen, you do not know exactly how it is going to be. Obviously if it was global warming it is going to be very costly, but we would need to adapt to it and we would. As I say, I think it would be sensible to do things that you can but it is not sensible to do things that cost a great deal extra because the world will not follow us.

Q316 Chair: The Government have spent £4.3 billion this year on what is called “the subsidy” across the whole sector. Of all Government budgets, is that really an excessive figure as long as we are doing something to meet climate change targets? We are doing our bit to try to ensure that temperatures are not going to rise by 2 degrees. It is £4.3 billion across the huge amount of money this Government spends. We are going to be spending £17 billion on Trident, for goodness sake.

Dr Constable: Let me comment on that. Since 2002 when the renewables obligation subsidy came in, consumers have spent around £15 billion on subsidising renewables. The subsidy contracts last for many decades, so even if we stop in 2020 and do not award any new subsidy contracts, the current ones would extend for another 15 to 20 years into the future. The total cost, the area under the curve, will be somewhere in the region of £160 billion. The macroeconomic impact is considerable and bear in mind that energy is a very special input, much of that is capitalised and then used as inputs by other sectors in the economy, so it is a very dangerous thing to do, certainly on that macroeconomic scale. That is the sort of reason that lies behind the Treasury’s determination to try to control costs.

You say, “Perhaps it is worth it”. That is a reasonable question. Will it deliver some kind of controlling factor over global climate? The UK emits roughly 1% to 2% of global emissions, so I am afraid the blunt truth is that we could have no significant physical effect individually on climate change. The role of the UK economy, the role of any small country such as our own, is to present an economically compelling example of the low-carbon economy. You look at the costs and you ask yourself is the UK’s example economically compelling to the rest of the world and you look at carbon abatement costs of somewhere between £100 and £1,000 a tonne and you say to yourself perhaps it is not economically compelling. It is conceivable that what we are doing is counterproductive. We are harming the case for a low-carbon economy by producing emission savings at such an extraordinarily and needlessly high cost.

Chair: All we can say is that is a view anyway that is obviously part of the conversation we are having about all this.

Linda Holt: I just wanted to bring up the example of Germany, which has the most renewable energy in Europe but, because of the problem of intermittency, had to start building coal-fired power stations so its carbon emissions went up. It is really unclear that having lots of renewable energy or onshore wind above a certain level is saving carbon, but because of the other adjustments in the system and the transmission and all other carbon costs, if you take that into account it is possible that you are increasing the carbon emissions. So even in its own terms it is not being successful.

Q317 Chris Law: Can I just come in on that point about Germany? Is it not the case that they started doing coal-fired stations primarily because they shut down nuclear reactors after what happened in Fukushima?

Linda Holt: Yes, but they need to get the power from somewhere so it is a backup.

Chris Law: I agree, but it is not in conjunction with renewables.

Linda Holt: Renewables could not do the job.

Chris Law: I am not disputing the point about intermittency and renewables on their own. What I was saying was the mix was because they closed down the nuclear reactors.

Linda Holt: Sorry, I would have to look this up. I do not think it is just in order to replace the nuclear because the point with renewable energy—I have the experts here and they will correct me on this—is that you need to have dispatchable generation, generation that you can switch on very fast. You cannot do that with nuclear, that is base load, and that is what you can do with coal and with gas-fired power stations.

We have no option. You talk as if we have this wonderful renewable future but because the security of supply is now so tight in Britain, we have all these diesel generators on stand-by, the most expensive, the dirtiest energy you can imagine. That is what is going to happen again. We are going to have to build more gas; we will have no choice. This is not about an ideal world; this is about reality.

Q318 Chris Law: But can I not just suggest to that, surely there are technological advances that we have seen already coming through, for example in battery storage capacitors. I will give you one example, Elon Musk's new car, the Tesla, which is going to be producing 500,000 cars year, really advanced where batteries are. I have to say the UK Government will be putting in £50 million this year. It was in the Budget. Surely by creating these kinds of technological advances and developments there is every future for a broad range of renewables as being a rich mix of our overall energy planning.

Linda Holt: I am sure there will be.

Dr Constable: The cost of the battery storage, so long as the problem is socialised over the entire system. The intermittency problems at present are nobody's problem because they are socialised over the entire system. In her recent speech, the Secretary of State at DECC, Amber Rudd, remarked that the integration costs for renewables should be charged to renewables. That is a very sensible idea because it would focus those technologies on finding means of mitigating and addressing their impact in which case you might see some development in storage. However, there are technical reasons for thinking it may be limited. The storage devices themselves are expensive; they have to recover their capital.

They have to recover their capital from charge-discharge cycles so you need to maximise the number of charge-discharge cycles over the period, a year say.

Ideally it would be so cheap you could have just one, winter to summer, because it is windier in the winter and less windy in the summer, but in fact the cost of the battery storage technologies is too high for that so you need to come down the timescale and find out which level of intermittency you are going to be dealing with. At present the battery costs are so high that they are only economic by dealing with relatively small short-term fluctuations in renewable output. They are interesting but they are nobody's problem at the moment, you are not going to see very large growth in them, and in any case there are technical problems that should make you realistic about the scale of contribution.

Q319 Chair: Thank you. Professor McLeod, do you want to say something?

Professor McLeod: All these are ideas that make sense if they can be done and in order to make sense and to find out whether they can be done you need to do the studies on it. I am sorry to keep going back on this, but we are just not doing them. We are saying this is a great idea. Okay, get the hard evidence for it.

Q320 Chair: Just one last question, and I pretty much suspect I know what the answer is going to be in all this. This inquiry, even though it has gone into some very interesting territory, was launched on the back of the recent announcements from the Government on renewable obligations and some of the issues about CfDs. I am presuming that you do not have any particularly strong views that the Government are doing the wrong thing when it comes to their withdrawal of support for renewable obligations?

Professor McLeod: I do not think the Government are doing well at all across the whole sector of energy because it is not being engineered. If they had an engineered plan and knew themselves what the costs were going to be—because they do not know what the costs are going to be—they would then be able to impose much more sensible subsidies. If you have a subsidy you have to pay enough that the investor will invest and you do not want to pay them more than is really appropriate and these things can be worked out.

Linda Holt: I agree with Mr McLeod. I think there should be a proper plan, there should be a national energy commission, as the John Muir Trust has suggested. One of the problems is that energy is a sort of a political football really. It is too easy to have lots of rhetoric about renewables or about nuclear or whatever rather than focusing on producing a secure, affordable, reliable supply of energy for the long term and we have not had that for decades in this country.

Dr Constable: I have a lot of sympathy with what the Government are trying to do. I rather suspect that any Government would be trying to do the same things. They are facing a dramatic overrun of costs and they must bring it within control. Bear in mind that when Brian Wilson introduced the renewables obligation system in 2002 it was not expected to continue for very long. After this number of years, after £15 billion of consumer subsidy, surely you should be seeing sufficient cost reductions to enable consumers to start to withdraw from that sort of artificial support. If that is not the case then it suggests that the experiment has not been successful and that you should withdraw in any case and try to find something else that will give you a low-carbon economy without excessive cost.

Chair: Thank you all ever so much and I am delighted we were able to secure your attendance here at this Committee. If there is anything further that you see in the course of this inquiry, please again send us any written evidence. I think there was a few requests for further evidence to support some of the statements that you made today. Anything that would help us in order to fill in with support would be very helpful. Thank you very much for your attendance today.