

Scottish Affairs Committee

Oral evidence: The renewable energy sector in Scotland, HC 745

Tuesday 15 March 2016

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Members present: Pete Wishart (Chair), Mr David Anderson, Kirsty Blackman, Margaret Ferrier, Mr Stephen Hepburn, Chris Law

Questions 176-221

Witnesses: **Matthew Bell**, Chief Executive, Committee on Climate Change, and **Professor Jim Skea CBE**, Member, Committee on Climate Change, gave evidence.

Q176 Chair: Good morning, gentlemen, and thank you ever so much for agreeing to come at short notice to this Committee inquiry. It was too good an opportunity. The Committee has just come down from Orkney, where we had a very interesting and informative visit. We managed to see some of the plant to do with renewables. It is a success story of Orkney in terms of its self-sufficiency. As the Climate Change Committee were in Edinburgh and we were coming through Edinburgh Airport, this was too good an opportunity to let pass by. We are grateful to have this opportunity to have a conversation with you. I think you know the remit of this inquiry. We are looking at the latest round of Government policy and announcements on renewables and the impact this is having on the sector in Scotland. We have already discovered and unearthed a lot of evidence to suggest that there is a drop in confidence in the sector, so we would like to explore some of these issues with you.

Perhaps we could start off with you telling us who you are and if you have any opening statements. We have a summary of your report today, so maybe one or other of you could tell us the main conclusions and recommendations of your report by way of an introduction. We would particularly like to hear that. I will start with you, Mr Bell.

Matthew Bell: I am Matthew Bell. I am the Chief Executive at the Committee on Climate Change.

Professor Skea: I am Jim Skea. I am a member of the Committee on Climate Change and my day job is a professor at Imperial College London. Matthew, I think you are going to do the introduction.

Matthew Bell: Sure. As you mentioned, we have set out in the latest report, which came out today, our advice to the Scottish Government about its climate change targets for the period from 2028 to 2032. The Committee on Climate Change is the official body, under the Scottish Climate Change Act, to provide advice to the Scottish Parliament and the

Scottish Government on its climate change targets and on the progress it is making towards those targets.

Periodically we provide advice on a new set of targets. We are required under the Act to provide this advice for that period, from 2028 to 2032, and the Government is then required to legislate those targets by the end of October. The advice that the committee has provided suggests that emissions should decrease in Scotland by 61% relative to 1990 levels by 2030.

Q177 Chair: That is an increase from 57%, which was up to 2028—is that correct?

Matthew Bell: The committee has a separate role at the level of the UK as a whole. We provide advice to the UK Parliament on a similar basis and for the UK as a whole we advise that emissions should fall by 57% by 2030, so the advice to Scotland effectively sets out Scotland as being more ambitious than the average across the whole of the UK. There are several reasons for that that we can explore, but one of the central reasons is that the Scottish Climate Change Act specifically says that there is a legally binding requirement on Scotland to reduce its emissions by 3% per year, starting in 2020. If you purely follow the mathematics of that through to 2030, you end up with a higher ambition than the ambition that the UK Climate Change Act creates.

Q178 Chair: Looking at your summary—and you can maybe talk me through—it seems rather modest other than your proposals when it comes to increasing the target to 61%. There are a few things but I noticed low carbon heat, the installation of heat pumps and stuff about electrical legals and more forestation. Are we being ambitious enough when it comes to setting out some of these proposals and recommendations?

Professor Skea: Yes. When we did the analysis on this, one of the things that we did was to compare these kinds of 3% reductions per year against two different bottom-up scenarios looking at very specific measures in different sectors of the economy. Of the two scenarios we looked at, one was a so-called central scenario, which was a cost-effective path for the UK as a whole; the other was a high ambition scenario, where we imagined all the measures that could plausibly be put in within technical and economic bounds, and you needed that high ambition scenario to get to the Scottish 3% reductions per year. We think that the 3% trajectory is an ambitious one, which will need the Scottish Government to increase the effort that it puts into place, but at the same time we think it is still plausible and realistic as long as that effort goes in.

Q179 Chair: As well as setting these targets—you have obviously considered how that is formulated and calculated—is there anything else that the committee does to assist the Governments in meeting these targets? Do you have a role in helping out and perhaps having conversations with Ministers about how this is achieved? Do you want to explain a little bit about that?

Matthew Bell: On an annual basis we provide a report to the Scottish Parliament—the next one of which we will provide in September—which sets out progress against the targets: is Scotland progressing satisfactorily or is there a shortfall against the targets? Within that report we provide an assessment of the policies and what additional action might be required by Parliament, by Government, by private sector and other stakeholders to make sure that we stay on track towards both the annual targets that Scotland has—the annual

targets, as well as ultimately the 2020, 2030 and 2050 ambitions. We do that on an annual basis.

Q180 Chair: Is the higher target for Scotland a reflection of the resources based here giving us more opportunity to harness renewables targets, or is there any other feature or factor that is included in the higher figure that you have come up with today?

Matthew Bell: It is a reflection of a combination of things. As you rightly say, one is a reflection of the natural resources and the potential for renewables at reasonable cost in Scotland. It is also a reflection, as we said earlier, of the requirements under the Act, which set out very clearly the 3% per year and enshrine that in law, so that implies a high level of ambition. Thirdly, it is also a reflection of the fact that in some areas it is more difficult for Scotland—particularly agricultural production, which has a higher proportion of emissions—than it is for the UK as a whole and, because it is more difficult, you have to start doing things earlier on in order to be properly prepared to meet the later ambitions, so it is a combination of those factors.

Q181 Chair: You serve both the UK and the Scottish Governments when you are setting these targets. Is there any tension in your role, given that you have a role for both the UK and Scottish Governments? What I am thinking about is the different emphasis and approach from the two Governments. We have seen an announcement that suggests at least a reticence among the UK Government for things like onshore wind and we have seen a lot of uncertainty about CfDs, and an enthusiasm from the Scottish Government that is probably a little bit more apparent. Is there a tension with how you are able to service both these Governments?

Professor Skea: I would not necessarily characterise it as a tension, because we have very clear guidance from the UK Climate Change Act and the Scottish Climate Change Act about the nature of the advice that should be given. As well as recommending the budgets in the UK and the targets for Scotland, we also have to do annual progress reports for both Parliaments. That is the point at which we highlight the difficulties where the Governments may need to step up effort if they are going to achieve their ambitions. In terms of the advice to the UK, we have flagged up—certainly in the last progress report, and we are continuing to look at it—that many of the announcements that were made during 2015 in some ways make it more difficult for the UK as a whole to meet its targets. We have raised that, saying “This is an issue that needs attention,” but I would not call it a tension between the two sets of advice. We are quite clear about the guidance we get from the two Acts.

Chair: We want to explore a little bit more about the issue of the recent announcements made by the Government. That is the basis of this Committee’s inquiry. Of course we will come onto that in some sort of detail but we have a question from Chris Law.

Q182 Chris Law: I was looking at Scotland’s share of the UK renewables sector, which is 29%. How important is this to the sector in meeting carbon targets, in particular with the challenges ahead that have caused uncertainty due to recent policy changes? What are your thoughts on that?

Matthew Bell: Picking up from where Jim left off, one of the central recommendations that the committee has made to the UK Parliament is that the Government needs to set out clearly the future path for the levy control framework, which is the funding available for low carbon generation—the path and what the level of the levy control framework is post

2020. We know pretty much what it looks like up to 2020 but we have no visibility post-2020, and investors could be making decisions now for projects that will only come online well beyond 2020. The committee has been very clear that making that step, alongside being clear about CfD auctions and being clear about ambition, is very important for the Government to do. In the recent set of announcements the Government has been clearer about what it is not going to do than it has been about what it is going to do.

In response to our last progress report, the UK Government committed that by the end of 2016—by the end of this year—they will set out in detail their plans for how they are going to meet what is called the 4th carbon budget, which covers the middle of the 2020s, and the 5th carbon budget, which is the one that the 57% refers to. Therefore, we are expecting detail to come forward by the end of this year, but we are also expecting some announcements before that. There might be announcements in the Budget next week on the levy control framework. So we are expecting announcements between now and then that will clarify it, and then the committee will be in a position, at a UK level, to judge whether those announcements are sufficient, given the UK climate change ambition. Similarly, on the Scottish side, the new Scottish Government will have to produce in the autumn what is called RPP3, which is their set of policies and proposals to meet the Scottish climate change ambitions. That will be something that the new Government will probably produce in the autumn again this year, and again it will be the basis for us to then say to the Scottish Government whether their policies and proposals are commensurate with the ambitions in Scotland.

Q183 Chair: Do you have any real powers, say, when you are looking at the UK Government and the Scottish Government and you are unhappy about the progress they have been making? I know you could write reports and whatever to suggest to them that they might not be meeting their own obligations, but have you any statutory power to oblige either the UK Government or the Scottish Government to change their view? If all you could do is give advice and maybe point out ever so gently where they are going wrong, what is the point to that, really?

Matthew Bell: There are two different statutory roles that the committee plays. One of its most important roles is as the guardian and the adviser on the actual targets themselves. The targets themselves, which are both legislated on the basis of the advice from the committee and have a statutory footing, provide the high level ambitions that the Governments in Scotland and in Westminster are bound by. The committee has a very clear statutory role, both in setting those targets but also in making sure that they are firm and that they can only be changed, for example, on the advice of the committee.

Q184 Chair: So your most powerful weapon is that you can embarrass either Government by suggesting to them that they are not meeting their obligations in the targets that you have set?

Matthew Bell: The separate statutory role we have is as a watchdog, in that sense, to both Parliaments and to be able to say whether they are on track or not. The Governments are required to respond to our reports and, if they disagree, to set out transparently what action they are taking that is still consistent with the targets. Clearly the committee spends a lot of time and takes a lot of evidence about what steps are necessary to meet the targets. If Governments disagree with those then they have to set out quite clearly the evidence base on which they disagree.

Professor Skea: Yes. I would just say that it is quite clear from both the Acts that our role is advisory, but we hope that we have built up quite a lot of authority and what you might call ‘soft power’ around that process, which I think is based on the quality of the analysis that we bring to the challenges, so that when we bring advice people actually listen to it, they look in detail at the analysis that underpins our recommendations. It is worthwhile saying that when I talk to people who work in the energy sector, they will spontaneously say, “We really value the work of the Climate Change Committee, because it provides a sort of analysis that we rely on ourselves for carrying out some of our strategies,” so although it is formally advice I think it is listened to. If you look at the processes around the debate about the 4th carbon budget, I think it shows that the evidence that we have provided is quite a powerful part of that debate.

Q185 Chris Law: I know you have said that we are waiting for figures to come out from both the Scottish and UK Governments at the end of this year, but if they don’t change, really, do you see the Scottish Government’s own targets being achieved in reducing emissions and in particular with the UK Government policy as it currently stands?

Matthew Bell: Again, let’s distinguish between the UK level and the Scottish level. At the UK level the committee was very clear in its last report to Parliament that it felt there was a shortfall once we get to the mid-2020s against the carbon budgets and the ultimate 2050 target, and that Government had to address that shortfall. That is what they are attempting to do but there is no question that, under the current set of policies, by the mid-2020s we are not on target for our climate change commitments.

In Scotland we think that the immediate term, which is enshrined in Scottish law as a 42% reduction by 2020, we are probably on target for that. Again, it is post-2020 where new sets of policies will also be required increasingly in areas such as transport, agriculture and buildings, low carbon heat. The Scottish Government has powers as well that it can use in order to advance emissions reductions, specifically in Scotland, in line with the greater ambition here.

Q186 Chair: The Government’s recent announcements on the renewables obligation, the uncertainty over CfDs, the feed-in tariffs and so on are why I am interested in the relationship—and I know you don’t like the word “tension”—between what the UK Government is doing, in terms of policy drivers, which is obviously going to impact on the Scottish Government’s ability to deliver their targets. What are you saying about that as a committee and are you recognising that? Are you prepared to say to the UK Government that what they are doing is having an adverse impact? We have been speaking to people and you should see our evidence about the confidence in the sector. It has been drained because of recent UK Government announcements. How do you manage and finesse that and report it?

Professor Skea: Perhaps I can just say that we will be doing our annual report to the UK Government in June, and I think the evidence we have heard from people suggests that this is a topic that we will need to address in a very clear way when it comes to the progress report to the UK Government. When we presented the 5th carbon budget recommendations to Parliament back in November, just before the Paris conference, and held the launch event, most of the questions that came through were about this question of policy clarity. We got very strong messages from the people who came along to that launch about how the investment environment had changed during 2015. We have still to draft this report, but

that evidence is one of the set of things that we will be feeding into that report in our considerations.

Matthew Bell: The committee wrote to the Secretary of State at the Department of Energy and Climate Change immediately after last summer and pointed out very clearly the impact on investor confidence of the decisions that had been made in the months of the summer period. At the same time, the committee also recognised that there were good and bad parts to the policies that had been cancelled. The most important thing is that what gets put in place now has the confidence of investors and has the credibility to take things forward.

Q187 Chair: Yes. We have only the summary of your report, so I presume that we will find within your full report at least an outline that the UK Government's announcements may have an impact on the ability to meet targets. Is that in your report? Have you mentioned this or featured this at all?

Matthew Bell: We have consistently mentioned the importance of investor confidence and the impact of policies on investor confidence, particularly in renewables and in the renewables area, and the committee has been very clear about that. This specific report is about 2030 and the annual targets that should apply from 2028 to 2030. In that context, what it does for the power sector, for renewables, is it sets out different scenarios that we think for renewables are consistent with that 2030 target, including getting renewables to be upwards of 200% of domestic consumption in Scotland by the time we get to 2030, and clearly the importance of investor confidence in that context in the report.

Q188 Chris Law: That is interesting because in Orkney yesterday the word that kept coming out was "uncertainty", and also the number of projects that both investors and companies are pulling out of all together, just abandoning. If you are talking about 200% by 2030, it seems there is going to be a lot of tension going ahead. But this is my question: if we have a look at the figures with regards to the Scottish Government, generating 100% of gross electricity would have to involve an increase to 1.4 gigawatts per year from renewables, which incidentally has never been achieved so far. Is this target actually achievable?

Professor Skea: Yes. Our calculations suggest that the 100% renewables covering consumption by 2020 is possible. We are aware that you took evidence from Scottish Renewables earlier where the chief executive said 80%-ish was what you were on target for, and I think that bracketing reflects an optimistic versus pessimistic view of the picture. What I think you would say is that 2020 is not the end of the picture and should you fail to get to 100% by 2020, I think you are on a trajectory to get there by maybe the early part of the 2020s. I think the 100% target is very feasible. It is worthwhile mentioning that by the time you go through that 100%, any extra is not going to reduce Scottish climate change emissions anymore. It is a commercial proposition for removing renewable energy to other parts of the UK where it will help other parts of the UK to meet the targets, and the benefit for Scotland is the commercial dimension of being able to sell that electricity. In terms of Scottish climate change targets, once you are roughly through that 100% it doesn't help Scotland so much meet its targets. It is helping the rest of the UK and it is a commercial proposition for investors and companies in Scotland.

Q189 Kirsty Blackman: We were discussing the policy background and the raising of concerns. Just to be clear, you would not shy away from raising concerns if you felt that the policy background was going to be an issue?

Matthew Bell: Not at all.

Professor Skea: No.

Matthew Bell: There is a series of letters on our website in the public domain from early autumn last year through to the one at the end of January where we followed up the powers of the Secretary of State. That is very clear about the concerns that the committee has.

Q190 Kirsty Blackman: In terms of how the policy background informs your recommendations or whether the recommendations should inform the policy background, where is the balance? Are your recommendations on climate change reductions and so on heavily influenced by the policy background, or are you setting ambitious targets that you would like the policy background to be edited to meet?

Matthew Bell: We start with the legal statutory framework, both the UK Act and the Scottish Act, which says that by 2050 emissions need to be reduced by at least 80% relative to 1990 levels. That is the starting point then for all the analysis. At a UK level we also have carbon budgets that currently take us out to 2027, and in Scotland we have the annual targets that take us out to the same period. That provides the envelope; then what the committee does is very much about what sets of policies and what types of actions the committee feels are required to meet those targets. That is a two-way process: that is the committee saying what is required to do that. The Government then legislates, proposes and develops different policies, regulations and funding streams, and the committee looks at those against where it thinks it needs and then comments again and it iterates between those two over time.

Professor Skea: Yes. I think it is worthwhile saying both the Scottish and UK Climate Change Acts specify very clear criteria that we need to consider when making our recommendations. There is one more criterion in Scotland that refers to rural communities and islands. The one I would flag up there is the question that we need to take account of energy policy when make our recommendations, because obviously security of supply and affordability are an important part of energy policy and we need to take account of Government policies, for example, in relation to fuel poverty and energy reliability in making our recommendations. It is quite clear also that, where we think the portfolio of policies that a Government have in place places a risk against meeting carbon budgets or targets, we have to say so very clearly. Certainly, in the earlier stages when electricity market reform was being developed, we had some quite strong messages about the need to create a framework that established investor certainty and provided firm prices for low carbon electricity.

Q191 Kirsty Blackman: One last question from me. In your recent advice, would you have been able to recommend more ambitious targets if the policy framework had been different?

Matthew Bell: The level of the targets in terms of the carbon budgets and the annual targets is more a function of the 2050 ambition and what the committee thinks is the least-cost path, taking into account all those other factors that Jim was talking about—fuel

poverty, affordability, security of supply and rural and island communities. Taking into account all of those factors, what is the best path towards 2050? That is the prime consideration for the committee. Then the question is: if policies are not sufficient to meet that, then action needs to be taken to bring forward policies that are sufficient to meet that.

Kirsty Blackman: Thank you very much.

Q192 Chris Law: Would you agree that the UK Government's policy making regarding reducing carbon emissions needs to be a long-term strategy rather than every five years shuffling it about? Do we need even a cross-party commitment to long-term policy change?

Matthew Bell: The central recommendation that we made in our last progress report was that there should be at least a 10-year visibility over that levy control framework, which is a central piece of policy for low carbon. At the time it was 2015 when we said, "You should at least have visibility through to 2025 on the funding levels." Now it is 2016, so it is 2026, but it is that 10 to 15-year framework that you need, which is precisely the framework that gets created through the carbon budgets at a higher level. That then trickles down to the power sector, giving longer term visibility of the power sector and for each of the other sectors that we also look at.

Professor Skea: There is legislation in both Parliaments that has been approved by all parties and, in a sense, there is that all-party buy-in to the long-term 80% plus reduction by 2050. The function of the carbon budgets for the whole of the UK, and the target timetables for Scotland, are such that it is intended to give that 15-year visibility about the direction of change, and, in the sense that these have to be approved by both Parliaments to go through, you can say that you do have the political consensus behind that sort of medium and long-term horizon.

Chris Law: Thank you.

Q193 Margaret Ferrier: What you say is interesting because yesterday, when we were in Orkney taking evidence, it appeared to me that the UK Government and the Scottish Government are taking two completely different paths on this. We have the UK looking at nuclear and shale, and on the other hand you have the Scottish Government looking at renewables, including wave and tidal, which is very innovative and forward thinking. To me they are on two different trajectories, so surely that has to come together.

Matthew Bell: The carbon budgets themselves are agnostic towards technology, so the carbon budgets require that emissions—carbon emissions and other greenhouse gas emissions—are reduced by the given percentages in the target years. The combination of technologies that you use to get there is a policy decision for Governments, and different Governments might make different decisions. We publish different sets of scenarios to try to set out different combinations of technologies that are consistent with those carbon budgets, but conceivably different Governments could decide to prioritise for different Parliaments, make different decisions to prioritise different types of technologies.

Q194 Chair: Does that mean you do not favour renewables over nuclear? As long as it secures the same reduction and meets the targets, there is not one technology favoured over another—would that be the case?

Matthew Bell: It is a bit more than “as long as it secures the targets”. It has to meet the other conditions in terms of being at least cost, being affordable, meeting security supply considerations and everything else that is in the Act, but the committee does not have a position that one low carbon technology is better than another low carbon technology. That is a policy decision for Government.

Professor Skea: Perhaps I could pick up on the question and maybe try to distinguish between policies on deployment of renewables and policies on research, development and demonstration, where I think things are slightly different. The deployment policies are things like the renewables obligation or the CfDs, and I think it would be fair to say at the moment there is some divergence in approaches between the Scottish Government and the UK Government. Onshore wind would be the classic example there.

There is probably much more convergence on the research, development and demonstration policies because, as a result of the Paris agreement, the UK has signed up for emissions innovation, which is the international initiative, with 20 different countries. That involves a commitment to double spending on energy R&D by 2020. The UK Government is currently working out how to do that. I think half of that may go to nuclear but the other half of the increase, certainly a lot of that is available for renewable energy and other things. Bodies like the Research Councils and Innovate UK are still carrying out lots of investment in energy R&D in the renewables kind of grid area at the moment, where I have to say that Scottish entities, whether it is Strathclyde University or companies, are doing quite well in the process. So I think the UK is still playing quite a strong role in terms of research, development and demonstration.

Matthew Bell: The other point to add on deployment is where the committee has felt that the evidence suggests a link between the future costs of technology and whether it is R&D or deployment. We have been very clear on that. For example, the Committee recommended deployment of offshore wind in the order of 1 to 2 gigawatts per year through the 2020s, partly because that drives down the costs of delivering offshore and helps meet the carbon budgets at lower costs. That was a commitment that the Secretary of State picked up in her speech in November and she committed, provided costs keep falling, to deployment levels of offshore wind. There is a relationship between how these technologies get deployed and what their costs are that we do comment on and we provide evidence about within the context of the overall ambition, which is the reduction in emissions.

Q195 Chair: You must be quite concerned then about some of the recent things we have heard about Hinkley with the difficulties financially. There was a debate that one of our members had last week on this very issue, and there is all this discussion about the EDF being in trouble and asking the French Government to come in to back them, the excessive cost, and the UK Government getting cold feet. Is that something that concerns you as you observe what is happening with Hinkley?

Matthew Bell: Hinkley, like every other project and sets of policies, we keep an eye on, because if there is a danger that the carbon targets will not be met then you need to have plan B or plan C in place. Certainly for the power sector, having a portfolio of different technologies—having a combination of technologies, precisely because you do not know which ones will end up being competitive, cost competitive, emissions competitive, in the 2020s and 2030s—and that range of options has been a very important part of the low carbon power policy for a number of years, and one that we have encouraged.

Professor Skea: Yes. Just to complete the suite of low carbon technologies, I think it is fair to say the Committee were disappointed by the decision not to continue support for the carbon capture and storage demonstration, which obviously included as one of the projects the Peterhead power station. That is an area in which demonstration has definitely been pulled back a bit, and we are very keen to see the UK Government come forward with new ideas as to how carbon capture and storage should be progressed. If we look at the ambition of the Paris agreement, I think all the analytical work shows you it is very difficult to achieve that unless carbon capture and storage is part of the picture in the longer term.

Q196 Chair: Before we move on from this, I was interested in another remark about the consensus that usually has been a feature of conversations about renewable technology and making progress towards targets. I think most of this Committee would observe that there has been a fracturing of that consensus lately with some of the policy announcements from the UK Government. This is not just a feature of UK versus Scottish Government, but even in the House of Commons now when we have these debates they seem to be a lot hotter than they have been in the past. I don't know if that is something that you recognise and whether you see that as a challenge, an issue, or a problem in our ability to meet these targets.

Professor Skea: We are obviously aware of it. Our chairman is a Member of Parliament and relays back to us the battles that take place in Westminster, I think in both Houses. We are well aware that the overall political temperature is changing a bit. On onshore wind in particular, the fact that onshore wind is still manifestly the cheapest of the renewable technologies that can be deployed at scale, and there are parts of the UK that are willing to continue with that deployment, it seems to me personally that that points you in a very obvious direction about where policy might go.

Q197 Mr David Anderson: I was going to ask you about some things that have probably already been answered, about the LCF and about the overall policy. I think you said that you are expecting to have a position by the end of this year?

Matthew Bell: That is correct.

Q198 Mr David Anderson: I share your concern about CCS disappearing, the concerns around Hinkley, the changes to tariffs, supports, subsidies for solar, and so on. Given what has happened in the last year, do we have any confidence that there will be any clear way forward at the end of this year?

Matthew Bell: The Government have committed to articulating a clear way forward by the end of the year and so other than—

Q199 Mr David Anderson: You take their word for it?

Matthew Bell: They have committed to Parliament, because they committed in writing to Parliament that they will set out how they are going to meet the 4th and the 5th carbon budgets by the end of the year. Certainly the conversations that we have with them on a day-to-day and week-to-week basis suggest they are working very hard at doing that.

Q200 Mr David Anderson: We have met people over the last couple of days who put their own money into relatively small-scale projects, but for them it is taking big chances, and they said for seven years they have felt like they have been getting stabbed in the back because the policy agenda has changed so rapidly. Yet within one of your things today, you are asking for electricity generation in Scotland in particular to be ramped down in terms of emissions, making it much more ambitious than it has been. The Scottish Government do not have control over electricity generation. How are they going to be able to deal with it?

Matthew Bell: There is no question that there is currently a very big hole in the future policy for the power sector, and that hole needs to be filled in. I guess it is difficult for us to comment on whether it is being filled in adequately or inadequately in the absence of the detail, but we have been very clear of the need to fill it in. We have set out in a number of places the types of levels that we think are consistent with the carbon budget. As you know, the levy control framework currently is forecast to be in the order of £8 billion per year by the time we get to 2020, and we have said that, by the mid 2020s, that needs to increase by another £1 billion to £2 billion per year to be consistent with the ambitions under the carbon budget. We have set out what we think is necessary, going forward, to provide the types of certainty and the types of action that you are articulating. It is now for the Governments, both in Westminster and in Scotland, to come up with those sets of policies, and then we will be able to say clearly whether we think they are commensurate with the challenges.

Q201 Mr David Anderson: One of the things we learned yesterday was that the isle of Orkney is producing more electricity than it needs, and it exports quite a bit of it into Scotland. They think they could increase, just from wind, at least tenfold what they are producing. At the same time, that would give a huge boost to the tidal and wave system, but it would need the grid to be upgraded to a total of £200 million. That is not an insignificant amount of money, but they said that they could not get that because Ofgem rules are basically saying, “Unless you can prove this is successful we won’t give you the money.” In one sense that is understandable, but that means you never have innovation. Would that be something that you would get engaged in at that level? Do you just say, “We need you to get out of this”? Or would that be something you could positively look at and say, “Why don’t we look at ways,” if it means changing Ofgem rules or whatever?

Professor Skea: Yes. Better electricity interconnection to the islands, and not just Orkney, would certainly help to get renewable generation off the ground. I guess the question is: to what extent is that the Scottish Government’s responsibility and what is the UK Government’s responsibility? You might imagine, because this is benefitting Scottish generation, it might be the role of the Scottish Government in providing the financial framework within which some of these projects could go ahead. Very obviously, it helps the islands to be self-sufficient; it also helps the prospect of exporting on to the mainland. There are other things that the islands can do. I know there is the NINES project, where you use energy storage as well as renewable generation to balance the system and make you secure on the islands without relying so much on diesel generation to back it up. I think it is a mixture of measures that are going to be needed.

Q202 Mr David Anderson: My understanding from the brief we have received is that the generation of electricity is not a devolved matter; it is a reserved matter. So when you are

saying, “Whose responsibility would it be?” I don’t know but I would guess it would be the UK Government. I understand and I agree completely with the point you made about the interconnectivity between the islands, but my push would be the export or import of electricity into Scotland and into England. I thought you would lose a lot through transmission. They told us that you would lose potentially 3% over 1,000 kilometres, which is virtually the whole length of the country. For me, that is going a long, long way to fuelling this country.

Professor Skea: Yes. I would just make the observation that the Committee provides advice to all three devolved Administrations, and the situation is different in each. In Northern Ireland, where I was last week, the responsibility for energy policy is devolved to the Northern Ireland Government, other than nuclear power, and there is more scope for the Government there to make investments and do things.

Chair: It comes down to the very obvious for us when it comes to some of these issues about how some of these—I know you do not like the word “tensions”—relationship issues can be resolved, and we are in this curious reserved/devolved area. I know Margaret Ferrier has a question on it.

Mr David Anderson: Sorry, Chair, it is also about giving confidence to investors. If I had the money, £1 billion, I would go and put it in a supermarket, because you don’t know what is going to happen tomorrow.

Chair: Absolutely. We will maybe explore this a little bit, but I know Margaret has a question on this.

Q203 Margaret Ferrier: Yes. Within the Smith agreement there was a proposal to devolve powers to determine supplier obligations in relation to renewables and also have a role in the development of renewables incentives. The other thing that was mentioned, quite importantly, was Ofgem is going to have to make their annual report and accounts available in the Scottish Parliament. As Mr Anderson has already pointed out, Orkney mentioned that that the Ofgem rules were an issue, and we need to look at that. Given the development of incentives for renewable energy generation is a reserved matter, do you feel that the Scottish Government have the necessary policy levers to achieve their carbon emission and renewable targets, or is this largely going to be determined by policy decisions by the UK Government?

Matthew Bell: I think we need to look at two very different issues. One is the carbon targets themselves, for reasons that we might want to brief you on, or brief the secretariat on separately. The carbon targets themselves are determined by a combination of what is called the “traded sector” and the “non-traded sector”. The power sector sits within the traded sector. The Scottish Government could probably meet their 2020 and 2030 targets under different types of devolution settlements because of how the accounting framework works around the power sector. The fact that Scotland becomes progressively more renewable beyond a certain point does not necessarily help to officially meet the carbon targets. Setting that aside, if the question is: can the Scottish Government drive progress in renewables to the extent that they would require, given the levers that they have in hand? It may be able to drive more progress if it had more levers at its disposal, but it would have to make the same types of decisions that are currently made at Westminster about spending across lots of different areas and where you prioritise spending.

Professor Skea: I think it is an interesting situation, because there are three different levels of policy making that are relevant to the development of renewables in Scotland. There is the EU level, obviously, because power is part of the EU emissions trading scheme, and there is the UK level and the Scottish level. I think it needs all levers being pulled with the same purpose to make sure that the progress works well. At the moment, given the current settlement and division of powers, the main function that the Scottish Government are serving is to make sure that the path is smoothed and that the obstacles are taken away from renewable energy because of the responsibility under the planning system. But the UK Government are responsible for the incentive structure and the drive that makes things go forward.

Under a different kind of settlement, the balance of powers when it comes to pushing renewables could certainly be different. At the moment, we are in a situation where each of the three levels of policy making has an influence over the process. I think we could tire you with this, but we are sometimes troubled about the way the EU accounting framework fits into the Scottish Climate Change Act, which is really a matter for footnotes. We do spend quite a lot of time in the Committee thinking about how that might work.

Q204 Margaret Ferrier: Yes. You have mentioned a smooth path, but obviously it is starting to look like a bumpy path with the renewables obligation getting pulled from under us. You also mentioned the connection with the EU. Does that mean that you feel we should still be part of the EU? With this EU referendum coming up we could be pulled out of the EU, and then they will not have any influence at all on energy.

Professor Skea: This is way beyond our pay scale to predict a view on Brexit or otherwise, though our chairman may have quite strong views on it.

Chair: Christopher Chope isn't here.

Margaret Ferrier: I know.

Mr David Anderson: A good job he has gone.

Q205 Margaret Ferrier: Yes. How do you feel the division of responsibilities other than electricity, carbon emissions, and renewables affect the advice that you would provide to each Government?

Matthew Bell: I think another way of going around the circle that we are going around is to say that clearly energy policy is designed to meet a whole range of objectives. One of those is to help make our contributions to reduce the risk from climate change and reduce emissions, but there are also policy objectives, as we have heard, around employment and local economies. There are policy objectives around air quality and healthcare. There are policy objectives around innovation, and exports, and all sorts of things. The different Governments will have different levers in each of those domains, to the extent that a very important part of the renewables policy in Scotland is about the economic benefits, the employment benefits, the opportunities for local communities. Some of those benefits and some of those levers clearly currently sit with the Scottish Government, and they may sit with them to an increasing extent under the devolution agreements that are in place.

There are potentially good reasons to pull those, but those are not directly within the remit of our Committee. Our Committee is specifically looking at the carbon-reduction ability

and what levers need to be in place to reduce carbon emissions from the power sector, taking these other things into account. In those areas then, the question is very much about the future of the levy control framework. How do we give investors certainty across the whole of the UK, including in Scotland, so that they can make the investments with certainty?

Q206 Chair: Even after the latest devolution settlement, most of the levers when it comes to electricity still remain in the hands of the UK Government. We hear very clearly what you are saying about electricity being perhaps a small part of traded carbon, and about heat and transport, which isn't within the remit and brief of this inquiry and report. We are specifically looking at some of the electricity sectors. But I think what is frustrating, and what is becoming apparent from the evidence that we are hearing, is that the UK Government control these levers that then impact upon objectives set with the Scottish Government, which then have impacts on targets that you have set the Scottish Government, and it is just how all this works together. The concern that is emerging, even in this session, is that the Scottish Government could do so much to try to meet some of these targets, but without having the levers at their disposal it is really only trying to mitigate parts of that or trying to do some stuff around the edges. Would that be a fair characterisation?

Matthew Bell: When it comes to specific levers for the power sector there is no question that most of them sit with Westminster.

Q207 Chair: Leave that aside. We get that. I think we would like to ask you some questions about heat and transport when we get to this, but when it comes to the electricity side of things, about how we get generation going and all the other things it needs, in terms of employment opportunities and just being a better country and producing more of this stuff.

Matthew Bell: Part of the point I was making is that more employment, the vision for the country, some of those wider benefits, I don't think achieving them through the power sector is purely down to who controls the renewables obligation or who controls the feed-in tariffs. That is an important part of it, but if the benefits of increased transmission links to the islands vastly outweigh the cost of that transmission link, those benefits are not just in terms of emissions reduction. Those benefits are in terms of economy and a whole range of other things. The question is: in the other areas can there be a more joined-up use of levers? The Scottish Government have levers over local economic development and a range of other areas. Can you join up those levers in order to then make sure that the relatively small costs—compared to the benefits—of increased infrastructure, or whatever may be needed, can be paid for? That will no doubt be a combination of things. The Scottish Government have to do things, Ofgem need to do things, the National Grid have to do things, and the UK Government need to do things.

Q208 Margaret Ferrier: Yes. My final question is: do you have any insight into how joined up the UK and the Scottish Government's policy in this area is? Do you feel that it would be more beneficial if they worked together more closely? If you have any thoughts on that at all.

Matthew Bell: I think working closely together is always a good idea.

Professor Skea: Yes.

Matthew Bell: Part of the Committee's requirements under the UK Act is to take the specific circumstances of Scotland, Wales and Northern Ireland into account in making recommendations to the UK Parliament. Therefore, we spend a lot of time thinking about the increased rurality of Scotland, the islands in Scotland, the higher proportion of emissions from agriculture, a whole range of unique characteristics that exist in Scotland. It is very important that policy that is made in Westminster reflects the specific circumstances in Scotland, and it is very important that the Scottish Government have the ability then to pursue their policies in that context, and we make our recommendations on that basis.

Q209 Margaret Ferrier: Yes. I think what the Chair is saying is that the Scottish Government are being held back because there are specific things that they have to look to the UK Government for. They hold the levers, whereas the Scottish Government don't. To take Orkney again as another example, the brakes have been put on in Orkney, and all that expertise that they have is now going abroad. What is going to happen is that in five to 10 years' time there will be countries that have overtaken Scotland. Why would we let that happen? It is craziness to think that there is this expertise and this passion in that island community for renewables and they are getting held back completely by the various policy levers held by the UK Government. I take on board what you are saying, that they are supposed to look at other areas within the UK, but are they, or are they concentrating on nuclear, shale, and other energy like that, rather than looking to the future to renewables?

Professor Skea: Yes. I would just say, obviously we have a relationship with the Scottish Government and we have a relationship with the UK Government. What we don't have insight into is what is happening on the other side of the triangle that we don't have visibility of. I think it is fairly obvious that civil servants do communicate with them, but we are not privy to the details of these conversations. Just to flag up one of the things that Matthew said, my contract for membership of the Committee on Climate Change obliges me to make sure that Scottish perspectives are reflected in discussions at Committee meetings. There is a kind of contractual underpinning for the process as well.

Particularly on the Orkney situation, if you were talking about EMEC specifically, onshore wind is pretty much a mature technology now; it is all down to a matter of deployment. I think the tidal energy stuff they do there is getting there, because we have a dominant design that has come in and major engineering companies are interested. The wave sector I think has had a setback with Aquamarine and Pelamis going into administration and collecting together the intellectual property into Wave Energy Scotland. My personal view is that that sector needs a little bit of a reset and needs to think about going back to basics, which is what I would hope that Wave Energy Scotland is able to do there. Certainly on the R&D side, Scotland has a role to play in supporting that as well, I think.

Q210 Margaret Ferrier: One of the other things that came up yesterday was that there should be a remote island CfD as well. That was one area that they called for, was the connection to the grid, the rules surrounding Ofgem and this remote island CfD. Why should they be paying more up there for energy and they are supplying all this energy? It just does not make sense.

Matthew Bell: Certainly, as you know, the design of those CfD auctions and the allocation of money to different pots within the CfD auctions is very much a topic that is being discussed now and has not been decided. To the extent that people have evidence or

suggestions, then sending them to us, sending them to the Department of Energy and Climate Change, sending them to the Scottish Government so they can communicate them. I think that is a very important part of where the process is right now in terms of the specific design of these mechanisms.

Q211 Margaret Ferrier: Can I maybe make a suggestion that you visit Orkney, because maybe it will change some of the thinking that goes into your reports?

Matthew Bell: I have said to the Scottish Parliament and I will say to you that we are very happy to visit Orkney and, indeed, all the other islands as well.

Q212 Chair: I think what you are hearing is the sense of frustration that has been reflected in the evidence that this Committee secured about disinvestment, about the real fear that where we were leading the way—and we have this incredible resource in Scotland—we now might be in a position where it is not harnessed and harvested. We may be going backwards in terms of meeting some of our obligations and securing some of these targets. Surely, as a committee that looks at these things, who are there to advise, support and make recommendations, this must greatly concern you, what we are observing just now. We characterise it as uncertainty. It is not just uncertainty, it is disinvestment. There are people pulling out of projects. I would not use the term “crisis” or ‘catastrophe’ yet, but is there any concern you have that, if we continue to head in this direction, this might have a huge impact on our ability to deliver?

Matthew Bell: I think we have been very clear about our level of concern. We have said on three or four very formal occasions to Parliaments that there needs to be greater certainty and greater vision around renewables, going forward, post 2020.

Q213 Chair: What would you suggest then to create that certainty? What needs to be done? We are obviously in a very tricky environment just now, in a situation where we are observing all sorts of difficulties in the sector. As a Committee our view of where we are heading towards is because of this raft of Government announcements. According to the Committee on Climate Change, who supports both the UK and Scottish Government, what needs to be done?

Matthew Bell: The committee has said that the levy control framework needs to be extended through the 2020s. It has provided figures about the level at which that funding should reach into the 2020s and through to 2030. The committee has said that carbon capture and storage policy needs to be effectively reset, given where we are today, and that we need to find a way of taking carbon capture and storage forward in a credible way. The committee has said that a big part of the story around continuing the cost reduction for renewables is continuing the deployment of offshore wind, and we set out ranges of future offshore wind, which the Government accepted, effectively, in the speeches that were made in November. The committee has been very specific in three or four different areas where we think there are key building blocks to achieving the power sector that is consistent with the carbon budget.

Q214 Chair: You are there to represent Scottish interest in this?

Professor Skea: Yes. Just to follow up on what Matthew has said, I think the thing that makes the terawatt hours' difference in terms of renewables will be onshore and offshore wind for the immediate future. There, it is the levy control framework that is absolutely the most important factor, which we keep pressing the button on. That is where we really need to get that deployment at scale. There is probably a more targeted set of recommendations for some of the other renewable technologies, and we have both noted the point about a pot of funding for island communities that is separate for CfDs. I don't think we have talked about that in the committee, but it is helpful for that to have been raised.

If I can go more to the R&D side, in my day job with Research Councils I have been quite involved in quite a lot of discussions about wave energy. One of the messages that is coming through there is that perhaps some of the companies tried to push the technology quicker than it was ready to move to scale. A lot of the developers we are talking to are very interested in smaller scale devices. Wave energy is already used to power buoys and provide the lights on them, for example. That is a very obvious example. But you could also look at simpler, smaller-scale devices that would be deployable on island communities where you might get more learning, before you try to make the heroic effort of putting in very large-scale devices that try to produce the gigawatt hours or terawatt hours of power. More by accident, I think that a lot of the people in the wave energy sector managed to overstate the maturity of the technology. A more measured pace on it would be a better lesson for longer term success, I think.

Q215 Mr Stephen Hepburn: We have heard that there has been significant progress in the UK when it comes to increasing the proportion of electricity that is generated by renewable technology, but much less in relation to heat and transport. Does this cause you concern and how should the UK and Scottish Governments address this?

Matthew Bell: Yes, it does cause us concern, and in our last set of progress reports we said, particularly on heat, that there is a need for a new strategy around low carbon heat, both in Scotland and at the UK level. Again, our understanding is that that will come out as part of the end-of-year statements at a UK level, and it will certainly be part of the policies and proposals that the next Scottish Government will produce in the autumn.

For heat, there are a range of different options. It is probably a combination of all of them that you have to look at, including heat pumps of various descriptions, heat networks of different types, and potentially biogas and other low carbon forms of gas going into the existing gas grid. Probably a combination of technologies, dependent on the nature of the communities and the nature of the housing and building stock that is involved.

Similarly, on the transport side, in the latest year we have data for, 2014, transport was the only sector that saw emissions rising at the UK level. All the other sectors saw a reduction in emissions. It is always hard to tell, on the basis of one year, whether that is a trend or whether that is just one year. We know that in transport it is the combination of ever more efficient vehicles coming into the stock, including more electric vehicles and more hybrid vehicles, combined with—potentially coming out of the financial crisis—people driving longer distances using conventional vehicles. Depending on the kilometres driven versus the efficiency of the vehicles, the emissions go up or down. We are monitoring that very closely and we made very clear recommendations about the need for continued support and, going back to some of our conversations about investor certainty, visibility over a long time period for that support for the rollout of low emission vehicles as well.

Q216 Kirsty Blackman: Particularly in relation to heat, it strikes me that there are three different levels that you can look at changing how heat comes in. You can look at it on the basis of an individual home, in terms of improving things like insulation; you can look at it in terms of communities—some communities don't have access to gas, for example, and there needs to be a change in relation to how those houses are heated—or you can look at it on a more national level and where generally, nationally, the heat sources come from. Where do you think there needs to be more effort in those sectors? Do you think there needs to be effort across the board and where are we most lagging behind on those three levels?

Matthew Bell: Unfortunately it is probably across the board, rather than one in particular.

Professor Skea: Yes.

Kirsty Blackman: That is useful.

Matthew Bell: Certainly you will see in the report that we have published today an emphasis on energy efficiency in Scotland particularly. That also clearly has other benefits around fuel poverty. Many of the homes that you mentioned that are currently not on the gas grid are also fuel-poor homes. We have recommended that, consistent with the type of 2030 ambition that we have advised, it would mean something like 800,000 homes being better insulated with cavity and loft insulation and about 200,000 homes with solid wall insulation. Energy efficiency, because of its potential to reduce emissions as well as because of its fuel poverty impacts, is an important part of the story. Indeed, more efficient homes then make it easier and more cost-effective to heat them with low carbon sources.

Then you come to look at the different combinations of low carbon sources, whether it is the heat networks that you have mentioned, which are probably more cost-effective in more densely populated areas like cities, or heat pumps, which may be more cost-effective for some of the rural communities and particularly today, as we speak, are more cost-effective in areas that are not on the gas grid, where they are currently often heating by relatively expensive means.

Q217 Kirsty Blackman: Just one more question on that. In terms of the policies of Government, I understand that the Scottish Government has done quite a lot to improve the insulation and things in individual homes. It has taken quite a good stance on that. How is Government policy across the board on these issues, at either a Scottish or a UK level? Is it moving in the right direction already?

Matthew Bell: You are right that the Scottish Government has been consistently more ambitious than the UK average when it comes to energy efficiency and low carbon heat. Having said that, the requirement for heat in buildings through the 2020s continues to be a very high level of ambition to meet the climate change targets. More will be needed, both in Scotland and at a UK level, on heat.

Professor Skea: One of the challenges in the heat sector and what differentiates it from electricity is that the solutions are going to be very locally determined and specific to their situations. With electricity, you get 1.5 gigawatts from Hinkley Point and 1 gigawatt from an offshore wind farm. It is a big impact in one project. Heat is much more small-scale, much more varied and, frankly, it needs an awful lot more hard work and effort put into it at both the Scottish Government level and with local authorities. That is where you need

the push to happen. It does need to be tailored to individual circumstances. There is no “one size fits all” solution. It is going to need to be tailored.

Obviously you look at a map of Scotland and you think, “This must be a very rural country.” If you look at the population, most of it is still in the central belt. It is quite urban, really, but we need to have policies that are also tailored to rural communities. Biomass boilers and ground source heat pumps may have a bigger role out in rural areas where the situation is different. When you get to the urban areas, it might be heat networks or air source heat pumps. You are going to need to see that variety in the local specification.

Kirsty Blackman: Thank you very much.

Q218 Chris Law: Just two final questions. They are not necessarily related. When we were taking evidence yesterday, there was quite a large desire for individual homes to create their own energy. One of the difficulties of course was that there was no place to store it—in other words, a battery. Have there been any reports or research done by you regarding battery storage in the future?

My second question, which is unrelated, is around transport. I know we are constantly measuring emissions as an indicator of how low carbon is regarding vehicles, but do we measure also the amount of carbon energy produced in making that vehicle in the first place? Would that be an effective measure going forward, in terms of consumers’ choices for cars?

Matthew Bell: Firstly, on battery storage, we keep a very close eye on what the costs are and what innovation is happening on battery storage. Our scenarios for the Scottish advice that we have just given include an additional gigawatt of storage in Scotland. We don’t specify whether that should come from batteries or from other technologies, but there is clearly a significant role for storage in the power system, whether it is at an individual home level or whether it is coupled with wind or solar, such that you get over some of the intermittency issues. There is a big role for storage.

We published a lot of research in October around security of supply and how to make sure the grid across the whole of the UK is secure. A lot of that was also looking at storage issues. There is no question that is important. For the very rapid decreases in costs of batteries that we have seen over the last decade or so to continue going forward is an important part of being able to meet the climate change targets cost-effectively. It is clearly not unrelated to transport because lots of that research has been driven by R&D in the transport sector. It then flows into the power sector and battery storage technologies as well.

Chris Law: Did you want to add anything on storage?

Professor Skea: No, that is fine.

Q219 Chair: I want to ask a little about intermittency. It was almost unbelievable yesterday when we were in Orkney that there was no wind and they were totally dependent on the National Grid coming in. We went to visit a wind farm and of course the turbines were standing there forlornly, not turning. An issue comes up about intermittency when you witness something like that and I am interested in your response about making some sort of progress on storage.

I saw your committee said that the challenges created by intermittency are manageable if certain steps are taken, and you obviously said a little bit about that. The UK Government also says about intermittent generators that they should be responsible for the pressures they add to the system. We are getting the carrot from you guys, looking at some of the solutions, but then here is a big wallop stick again from the UK Government that are looking to punish the renewable sector for its very nature, being intermittent. While there is obviously progress toward storage, this is not a great use of language in trying to be gently encouraging.

Professor Skea: We had work by Imperial College and NERA commissioned to carry out work on flexibility in electricity systems for a 5th carbon budget report for the UK. One of the very strong messages that came out of that is that if you invested in flexibility measures in electricity networks—which includes storage, interconnection and demand-side management—the extra costs of integrating renewables into an electricity system could be very, very much smaller than if you just stood back and tried to do a “plug and play” into the existing system. If you follow these steps on flexibility, the extra costs of integrating renewables are not punitive. My personal sense is that it is not unfair that renewables should bear these costs but, let’s be clear, these are not necessarily prohibitive. You are ruling renewables out.

Q220 Chair: Should there be a greater incentive then to try to resolve some of the storage issues? Yesterday, again, there was a lot of talk about lithium batteries, for example, and the demand-side approach, which is always mentioned when it comes to this. Surely one of the great solutions when it comes to renewables as a dependable and, hopefully, exclusive form of energy is getting the storage issue solved.

Professor Skea: Yes. There are many technical approaches to storage and not all of them are high-tech. You have SSE with an interest in new pump storage schemes in Scotland. The most humble and simple way of storing energy is in a hot water tank, for example, and in Denmark they have a very ingenious way of linking wind energy, combined heat and power systems and hot water storage tanks that allows the whole system to be balanced together. A hot water tank is not rocket science in terms of technology.

Lithium batteries and a battery approach to storage are part of the picture. They can certainly work in island communities and they can certainly work at the level of distribution networks to help you avoid new investment in transformers and so on, but storage is a mosaic of technical solutions. It is not just one thing. It is not just batteries. There is a lot we could do already on that.

Chair: We are grateful. Are there any last questions from anyone?

Chris Law: I just want an answer to the question I asked that you came in on.

Chair: Yes, sorry.

Q221 Chris Law: Consumption-based?

Matthew Bell: On transport and life cycle?

Chris Law: Yes.

Matthew Bell: Certainly, when we do our analysis, we look at what is called the whole life cycle carbon costs of different technologies. For a car that would include from its manufacture all the way through to its use on the roads and it is similar for other technologies. That is relevant, clearly, when it comes to thinking about climate change issues and the fact that we are only going to tackle this at a global level, understanding those life cycle emissions and consumers being more aware and having more information about the total life cycle costs.

Specifically for cars, when you look at the carbon involved in their manufacture compared to the carbon involved in the decade or more that they run on the roads, often there is much more carbon—assuming they are not electric vehicles—involved in them running on the roads. You have to keep those relativities in mind.

Finally, in terms of our carbon budgets, what matters is production-based emissions. When they are produced in the UK then those emissions would count formally in the carbon budgets. Where they are manufactured elsewhere it does not count formally in the UK's carbon budgets. That is not to say we should not take it into account. Certainly I emphasise the importance of something like the Paris agreement, whereby you have every country acting to reduce its production emissions such that, as the world as a whole, we reach the global ambitions. Any single country acting by itself is unlikely, obviously, to resolve the whole global climate change ambition.

Professor Skea: I might add that a few years ago, the committee—I think this was before Matthew was chief executive—produced a report at the request of the UK Government, recommended by the UK Parliament, on consumption-based emissions, full stop, and how to treat them. We certainly made a recommendation there that, although the main carbon accounts for the UK should be done in production terms, it was useful to produce satellite estimates or satellite accounts that did consumption-based accounting as well. Obviously the value of consumption-based accounting is to try to influence consumer decisions so sources of information like labels and so on are quite helpful. We concluded that consumption-based accounting could not replace production-based accounting but it was a suitable augmentation to the existing way of doing things.

Chris Law: Thank you.

Chair: We have run out of time because we have to get down to London for a vote this evening in the House of Commons, but we are grateful to both of you. It was a fortuitous turn of events that you happened to be in Edinburgh as we were passing through. You have greatly helped this Committee in its inquiry. You know the themes we are trying to explore and get at here so, if there is anything further you feel would be helpful to the Committee, please give us anything in the way of written evidence. We are happy to accept that. Thank you very much for coming along this afternoon and good luck with the rest of your media appearances with your report.