The Scottish Parliament
Pàrlamaid na h-Alba

Official Report

ECONOMY, ENERGY AND TOURISM COMMITTEE

Wednesday 14 March 2012

Session 4

Wednesday 14 March 2012

CONTENTS

ECONOMY, ENERGY AND TOURISM COMMITTEE
9th Meeting 2012, Session 4

CONVENER

*Murdo Fraser (Mid Scotland and Fife) (Con)

DEPUTY CONVENER

*John Wilson (Central Scotland) (SNP)

COMMITTEE MEMBERS

*Chic Brodie (South Scotland) (SNP)
*Rhoda Grant (Highlands and Islands) (Lab)
*Patrick Harvie (Glasgow) (Green)
Angus MacDonald (Falkirk East) (SNP)
*Mike MacKenzie (Highlands and Islands) (SNP)
*Stuart McMillan (West Scotland) (SNP)
*John Park (Mid Scotland and Fife) (Lab)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Graeme Blackett (Biggar Economics)
Stan Blackley (Friends of the Earth Scotland)
Richard Dixon (WWF Scotland)
Jim Eadie (Edinburgh Southern) (SNP) (Committee Substitute)
Richard Marsh (4-Consulting)
Helen McDade (John Muir Trust)
Aedán Smith (RSPB Scotland)
Niall Stuart (Scottish Renewables)

CLERK TO THE COMMITTEE

Stephen Imrie

LOCATION

Committee Room 1

Scottish Parliament

Economy, Energy and Tourism Committee

Wednesday 14 March 2012

[The Convener *opened the meeting at 10:00*]

Renewable Energy Targets Inquiry

The Convener (Murdo Fraser): Good morning, ladies and gentlemen. Welcome to the ninth meeting in 2012 of the Economy, Energy and Tourism Committee. I remind all members to switch off their mobile phones and other electronic devices. We have received apologies from Angus MacDonald and welcome Jim Eadie, who is here as his substitute.

We are continuing our inquiry into renewable energy targets in Scotland. I welcome our first panel: Richard Marsh, director of 4-Consulting; Graeme Blackett, director of Biggar Economics; and Niall Stuart, chief executive of Scottish Renewables.

Members have a number of questions, but first I invite the witnesses to make a short opening statement to introduce themselves.

Richard Marsh (4-Consulting): I am director of 4-Consulting, which is a consultancy based in Scotland. I have completed a number of economic impact studies that are relevant to the inquiry and I recently co-authored the report "Worth the Candle? The economic impact of renewable energy policy in Scotland and the UK".

Graeme Blackett (Biggar Economics): I am managing director of Biggar Economics and a trustee of Reform Scotland. I was the author of Reform Scotland's paper "Powering Scotland", which looked at energy policy.

Biggar Economics works regularly in the energy sector, in areas that include the economic impact of energy developments on other sectors such as tourism, and innovation system research and development. We are currently undertaking some work with RenewableUK on the economic impact of the onshore wind power sector over the next decade or so. That is worth mentioning because it will probably be reported on within the timeframe of the committee inquiry.

Niall Stuart (Scottish Renewables): Essentially, the inquiry has three parts: it looks at the electricity target, the heat target and renewable transport. Our submission focuses on the first two parts.

On electricity, we think not only that we can meet the 100 per cent target set by the Scottish Government, but that by doing so we would achieve the following: a massive reduction in carbon emissions from the power sector, which would spearhead wider steps to tackle climate change; the creation of thousands of additional new jobs in renewables, which would build on the thousands of jobs in renewables in Scotland today; and the creation of a major new export sector, which would export power, technology and skills. Meeting the target would also contribute to the development of communities across Scotland. Finally, it would reverse our growing dependence on energy imports, which in turn would protect consumers from further increases in gas prices. As one of your future witnesses might put it, Alex and Scotland would be mad not to embrace the targets and what we would achieve by progressing to them.

Heat accounts for almost half our carbon emissions, more than half of Scotland's energy use and 60 per cent of energy costs for Scotland's households. We urge the committee to focus on how to help businesses move away from coal, oil and gas, all of which are driving up energy bills.

A move to renewables for heating homes and businesses could pull many people out of fuel poverty and prevent others from going into fuel poverty. The fuel poverty debate has particular relevance to Scotland, given that a third of all homes are off the gas grid. The renewable heat incentive will be extended to households this October. I encourage the committee to consider how to maximise its impact, because it could be the single biggest tool in tackling fuel poverty in Scotland.

We hope that the inquiry will focus the debate on the key challenges in meeting the electricity target and on the benefits that meeting the target will bring. However, I think that the most exciting part of the inquiry is the challenge of how to develop effectively a blueprint for the roll-out and acceleration of renewable heat technologies such as biomass, solar and ground and air-source heat pumps across Scotland. If the committee meets that challenge, I am confident that the inquiry will play a key role in leading the clean-up of our energy sector, creating local jobs across Scotland and tackling fuel poverty.

The Convener: Thank you. Members have a number of questions on a variety of different subjects. The witnesses should not feel that all three of them have to answer every single question. They are welcome to contribute, but there is a time constraint. We will start with jobs and the economic benefit of meeting the targets.

Stuart McMillan (West Scotland) (SNP): Mr Marsh, can you explain what a temporary construction job is, as you understand it?

Richard Marsh: Broadly, a temporary job is one that we would not expect to be sustained over the long term.

Stuart McMillan: In that case, surely every construction job—whether in turbines, ships or housing—could be defined as a temporary construction job. Is that correct?

Richard Marsh: There are two issues there. In the construction industry someone may have a long-term job in which they go from project to project. For a construction company, that would be a permanent, long-term job. The jobs sustained through an individual project—whether it is building housing, roads, or any kind of transport or energy infrastructure—would be temporary in nature. If 100 people are needed to build housing or a road, it would be incorrect to say that that would create 100 permanent jobs. The jobs will be temporary. A better description might be that 100 people will be employed for three years, requiring 300 person years' worth of employment.

Stuart McMillan: You mentioned people going from project to project. Once manufacturers of renewable energy equipment have an order, surely they would try to bring in more orders to sustain employment. Surely that goes on in all forms of construction.

Richard Marsh: That is a reasonable suggestion.

Niall Stuart: Stuart McMillan's question is based on the report that Richard Marsh published under the banner of Verso Economics, and I have one or two comments on that report.

The report grossly underestimates levels of employment in renewable energy in Scotland. We are also doing work on employment and we think that the number is at least six times what has been set out in the report. I would comfortably wager that there are at least 1,100 jobs in renewable energy in the Mid Scotland and Fife area, never mind in Scotland as a whole.

The methodology compares the renewables obligation with the VAT increase. The VAT increase was money that the Government took in to pay off the budget deficit. The renewables obligation financed huge amounts of investment in capital equipment and in operating renewable energy projects. Of course, the jobs that have been described as temporary include manufacturing jobs as well as construction jobs. If manufacturing of off-shore wind turbines, towers and bases comes to Scotland, it will serve primarily the Scottish market, which we expect to grow more than is currently anticipated. It will also look to serve demand from the rest of the United Kingdom and Europe. We expect many of the jobs to be anything but temporary.

The Convener: Clearly we have opened up a whole new area of debate. Mr Blackett is keen to come in, after which I will let Mr Marsh respond.

Graeme Blackett: On a similar point, if we look back five or six years, there was an economic development opportunity in the energy sector—and renewable energy, in particular—that was missed by many people. It was thought that a lot of the turbines would come from Denmark or Germany and so there would not be much impact and the jobs would be short term. However, if we look at what has happened over the past five years in places such as the Highlands, expertise has been developed in the civil engineering sector and there is expertise in project development and the professional services that go with that, so Scotland could export those services to other countries. That is just a small example of the scale of the potential of some of the newer technologies. A good example is that of some projects on which we are working with Scottish and Southern Energy that it is developing in the Highlands. It estimates that it currently has 1,800 people working in the Highlands alone, many of whom are in the renewables sector.

Richard Marsh: The point that we are making about temporary employment is that any Government investment or intervention in the market will result in temporary jobs that are associated with building infrastructure and kicking off a project. What we are emphasising is the importance of what the asset actually does—what it delivers long term—once it is on the ground and up and running. Housing is for people to live in and a road is for cars to travel on. Knowing how many people are needed to develop that asset over the short term is useful, and that plays a role in deciding what to fund and build, but it should not be used as the justification for support or intervention.

Stuart McMillan: We have heard from the witnesses that in the renewables sector there are more than 1,000 jobs in Mid Scotland and Fife and more than 1,000 jobs in the Highlands. Do you still maintain that there might only be 300 jobs?

Richard Marsh: It is important to note that I do not maintain that there will be 300 jobs: the figures in the Scottish Renewables report suggest that if the failed scenario was to come true, around 300 operations and maintenance jobs in the offshore industry in the North Sea would be sustained in the long term.

Stuart McMillan: That takes me to my second point, which is about the lifespan of the turbines. A turbine has an estimated lifespan of 25 years. The

construction of the infrastructure and the turbines is followed by the operational and maintenance period, which is followed by the decommissioning element some years down the line.

There is a tremendous amount of decommissioning experience, particularly in relation to offshore infrastructure, and I dare say that that could be used in decommissioning offshore and, no doubt, onshore turbines. Is there any estimation of how many jobs will be required to carry out that particular task, bearing in mind that technology improves daily and there is the possibility of a new turbine with better technology being installed when an old turbine is being decommissioned?

Graeme Blackett: You have highlighted the longer-term economic effects. Those are easy to see because you can look at how other industries have developed, and the oil and gas sector is the obvious one to look at. Some 10 or 20 years ago there was criticism that a Scottish oil company had not been developed, but what has developed are operations and maintenance companies that have become world leaders in that field, that employ a lot of people in Scotland and that export around the world. Similar developments are possible in offshore wind and in marine renewables, such as wave and tidal power, in which you would expect a manufacturing sector that could export to develop.

Stuart McMillan: Before Mr Stuart comes in on that point, you have raised an important point about the longer term. I am sure that all committee members agree that, irrespective of who is in power, the issue for the sector is about energy provision and generation and long-term employment opportunities, and that it is not about a short-term hit. Do you agree?

Graeme Blackett: Absolutely.

Niall Stuart: Stuart McMillan makes a valid point about the likely high employment levels in decommissioning. I do not think that anyone has reached the stage of working out employment levels, not least because my organisation and Graeme Blackett's are wrestling with getting good employment figures in renewables—in my case for Scotland, and in Graeme's case for the UK.

Stuart McMillan is right to highlight that approach, which is already happening onshore: wind farms are being repowered following additional investment. I reinforce Graeme Blackett's point that the industry is growing quickly, sustainably and for the longer term. If we are successful in bringing companies such as Samsung, Mitsubishi and Gamesa to manufacture here, the capital investments that they make will be around for a long time to generate the return on investment that those companies seek.

The Crown Estate has signed agreements for 10GW of offshore wind projects, which are likely to be built over the next 10 to 15 years. There is talk of a round four for offshore wind, so there will be additional capacity to build out. There is 45GW available around the UK. As I said, European and international markets that develop more slowly than ours will also provide new markets for manufacturers in Scotland.

10:15

Richard Marsh: I broadly agree that such things are so far off in the future that it is difficult to work out the scale of employment that is likely to be associated with decommissioning. I draw us back to the points in my submission about whether the Scottish Government has estimated the overall costs of achieving the targets. A number of conceptual issues must be grappled with. We have talked about the possible scale of decommissioning in the renewables industry as an economic benefit. Some time ago, development agencies in Scotland commissioned similar work on the decommissioning of nuclear power facilities as an economic benefit. Today, an argument could be made that that sat on the cost side of the ledger. Some work must be done on the scale and the costs that are involved and on whether Scotland would have a net benefit.

Stuart McMillan: I dare say that decommissioning turbines would be cheaper than decommissioning nuclear power stations.

You said that decommissioning was so far in the future as to make estimating the job situation difficult. Given that, is it fair to say that there will be only 300 permanent jobs in the renewables sector?

Richard Marsh: I return to my earlier point. In the Scottish Renewables report, the visionary scenario suggests up to 50,000 jobs. In the failed scenario, the long-term operation and maintenance of the offshore industry in the North Sea involves 300 jobs. That is a Scottish Renewables report, not my report.

Patrick Harvie (Glasgow) (Green): Good morning. I am a wee bit worried that we are starting off on the wrong foot; the debate is not about what the best job-creation scheme is. All political parties agreed in passing the Climate Change (Scotland) Act 2009, and the overwhelming bulk of the thousands of people who contributed to the consultation on it agreed that we need an urgent reduction in Scotland's greenhouse gas emissions. It is clear that that cannot be achieved without re-engineering the energy system—heat, transport and electricity—to which Niall Stuart referred. If we are talking about that scale of re-engineering, there will be doubt

and uncertainty about the precise scale of economic activity, about the number of jobs and about the balance in 2020, 2030, 2040 and 2050 in relation to developing, installing, maintaining, renewing, replacing and decommissioning energy technology, as well as re-engineering the grid, developing smart grids and high-voltage direct current transmission and investing in the building stock to reduce demand. A huge amount of work needs to be done.

Regardless of the areas of doubt and uncertainty, is not it clear that the challenge remains the same? It is how—not whether—we ensure that Scotland gets the maximum benefit and shares that benefit as equitably as possible across society. Will the witnesses move the debate on to how we will maximise benefit from its being on whether we can be sure of numbers in 20 or 30 years? Everybody knows that we cannot be sure of them?

Niall Stuart: I will briefly conclude the previous discussion, as it concerned a report that we commissioned with Scottish Enterprise. The idealised scenarios were about the potential impact on the economy if Scotland did as well as it could in building offshore wind facilities to 2020, and captured a share of international markets. The low-end scenario signified failure to build a significant proportion of what we have agreed with the Crown Estate, and failure to capture a significant slice of international markets. That scenario was deliberately negative and was deliberately included to show what failure would look like. The jobs toll was low precisely in order to contrast a good result with a bad result.

How do we ensure that we get the good result and not the bad result? The answer is to be found in the things that we identify in our submission. First, there is no point in Scotland installing the renewable generation capacity such as we are talking about if we cannot transport the electricity to where it will be consumed, which is the central belt, the rest of the United Kingdom and—further down the line—markets in Europe.

A huge amount of progress has been made, even in the past two months, with the Office of the Gas and Electricity Markets fast tracking SSE and Scottish Power's blueprint for investment in transmission upgrades to 2021. The electricity network strategy group, which is chaired by Ofgem and the Department of Energy and Climate Change, has set out a vision for the electricity grid that is required for Scotland to hit its 100 per cent target and for the UK to hit its 15 per cent renewable energy target. Ofgem's decision to fast track those business plans effectively endorses those investments. Now the transmission operators can get on and build the upgrades.

The second thing that we have identified is electricity market reform and the uncertainties that it has created. We need the UK Government to make clear proposals that will give the industry confidence and allow it to invest for the future.

Finally, we need the right balance in the planning system, particularly in the emerging planning system for offshore and wave and tidal power. In pursuing the national priorities, we need the right balance between changing energy policy, tackling climate change, and dealing with local impacts and perceptions of impacts.

On heat, the priorities are to finally get the renewable heat incentive off the ground for domestic consumers and to raise awareness of the renewable heat incentive and what it can mean for householders and business. In the case of business, it will not just save costs, but will potentially generate revenue for companies. We need local and national Government to drive forward district heating networks and to put in place financial mechanisms that incentivise them. That will help to overcome the huge capital costs and hurdles that are involved in local authorities and housing associations developing such networks.

Graeme Blackett: I do not want to return to the previous topic, but the two things are very much linked. The reason why they are linked is because the targets—both the renewables target and the broader climate change target—are sending out a message that Scotland wants to take the lead in the area. That creates first-mover advantage, and as a result we have an opportunity to maximise the economic benefit.

A key example is that, in the longer term, towards the end of the decade, we will begin to see deployment of marine renewables. It is important that we think about how we will get there and how we will make it happen, and that is where the investment in research and development infrastructure that is already happening is important. Our expertise in the universities is centred on the energy technology partnership, which is led from the University of Strathclyde. Also at Strathclyde, we have a major investment in a new facility, which is being made jointly with private sector investors, and we have the recent announcement by the Technology Strategy Board of the offshore renewable energy catapult, as it is called—it is a terrible name, I am afraid. That is another R and D centre that is headquartered in Glasgow.

Those are examples of the investment that is required to realise the opportunities, and it is encouraging to see that they are actually happening.

Richard Marsh: I think that I agree with everything that Patrick Harvie said. In our submission—and in previous work—we have highlighted that, in terms of cost, climate change and energy security, we can make a case for Government intervention. It is interesting that such a strong case is being made on the basis of economic development. From what Patrick Harvie said, it seems that focusing on the main challenge that is posed by climate change is how he expects the argument to be framed. To summarise his earlier point about the economic development aspect, the claims that are being made about the number of jobs that are involved can be questioned.

Patrick Harvie: Is that a criticism of the policy or of the presentation of the policy? Even if we start with the imperative for doing this, we still end up in a discussion about how to gain and share fairly the economic benefits, rather than saying that we should not do it if the economic benefits are questionable.

Richard Marsh: There are two points to be made. First, you are right that it is a criticism of the presentation. The questions about what we can draw out of the sector and how we can share it are the key questions and a lot more work needs to be done on them. So far, we have talked about what might arise out of the renewables sector, but how will the cost be spread and who might benefit from it? The answers to that are sparse and the issue needs further consideration.

Patrick Harvie: Okay. Thank you.

The Convener: Has anyone estimated the cost per job in development of renewables? Some information that we got from the Scottish Parliament information centre last week suggests that it could be very high. Has anyone done any work on the number of jobs that will be created and the overall investment that is going in, much of which is coming directly from Government?

Graeme Blackett: I do not have a figure to hand, but we should be careful with such numbers. They need to be benchmarked against something else. Such a figure is meaningless on its own. It needs to be set in the context of the cost per job in other forms of generation, for example.

Patrick Harvie: Perhaps we could compare it with the cost per job of members of the Scottish Parliament.

The Convener: I am sure that we provide excellent value for money.

Chic Brodie (South Scotland) (SNP): If I may, I will briefly address further the issue of jobs. Mr Marsh, in your submission, you say:

"The economic benefits that derive from the renewable energy sector are hard to assess because the industry is difficult to measure as a clearly-defined sector."

You then go on to assert positions that seem to imply that you have focused only on offshore wind. Have you done any other estimate of a more balanced mix of renewables, such as hydro, marine and so on? It appears to me that you have not included those in your submission.

Richard Marsh: We included the Scottish Renewables report to demonstrate that there is a big difference—

Chic Brodie: Yes, but I am asking what your opinion is.

Richard Marsh: Could you restate the question?

Chic Brodie: Your submission says:

"The economic benefits that derive from the renewable energy sector are hard to assess because the industry is difficult to measure as a clearly-defined sector."

The rest of your submission goes on to assert particular positions about jobs while focusing almost entirely on offshore wind when we are talking about a balanced mix of renewable sources. I would like to understand your view of the number of jobs that might be created in those other sectors. If you have not done that, that is fine. I am sure that you would want to submit such information in the future, but if you do have some idea, we would enjoy your sharing it with us.

Richard Marsh: We used offshore wind as an example—I am not suggesting that we have concentrated on it—to show that the number of jobs can easily be overstated in a report.

In the main calculations that we put into "Worth The Candle?" we included all production of renewable energy that can receive renewables obligation certificates.

Chic Brodie: Can you say what you think are the implications for jobs in hydro or marine?

Richard Marsh: I do not understand the question. The implications of what?

Chic Brodie: You have criticised previous estimates of 48,000 jobs or 40,000 jobs—whatever the number is—that will be created in generating energy security and cutting emissions, but you appear to have relied on earlier statements and focused on offshore wind. I would like to understand the macro position around the balanced mix of energy, and the job position that you envisage when you look at all the sectors.

10:30

Richard Marsh: The figures that we quoted for the "Worth The Candle?" report relate to the broad

balance of energy mix. Therefore, the number of jobs that we stated would cover the whole industry's production of renewable electricity. The part that we excluded is hydro power, because it is not liable for renewables obligation certificate support.

Mike MacKenzie (Highlands and Islands) (SNP): Does the panel agree that, although the scope of the inquiry is to look at the Scottish Government's targets for 2020, perhaps that takes a fairly narrow view? It is likely that, even by 2020, when we achieve those targets, we will have realised the opportunity for harnessing only a relatively small proportion of our energy capability. The industry is likely to continue to grow well beyond 2020. Even if we take on board Stuart McMillan's point about decommissioning and the lifespan of turbines being perhaps 25 years, do you agree that the technology is probably at the Model T stage and that, in the future, the devices are likely to be replaced by more efficient and clever devices? Do you agree that the industry and the economic benefits and jobs that it creates will probably go on until the end of the century and well beyond that, as long as we need energy?

Graeme Blackett: In 2020, we will still be in the early days of the offshore wind sector. Marine energy will make a very small contribution. It is very much the start of the process, and it will probably be 2030 until there is significant deployment in those sectors. I therefore agree with those comments.

Niall Stuart: It is well researched and evidenced that Scotland's renewable resources can meet our own demands many times over. The 100 per cent target has been derided as being overly ambitious, but we have the resources to meet many times the output that is required, and the 100 per cent target. Ultimately, whether politicians and the Government want the industry to continue to expand after 2020 will come down to a political decision. I am confident that they will want it to do so because of the environmental and economic benefits that we set out in our submission.

Mike MacKenzie: Would it be fair to say that the jobs and economic benefits are likely to increase and that the jobs that the industry creates are, to all intents and purposes, as permanent as any jobs in any industry?

Niall Stuart: Of course—that is why the ambitious targets have had power. They have put Scotland firmly on the map for investors in renewable energy. To try to conclude the debate around Richard Marsh's report, I say that the faster and bigger the industry grows, the bigger its investment value will be and the more jobs it will support. It is that simple.

Graeme Blackett: That will be the case provided that we do not get the policy wrong. We can see what happened with the onshore wind sector and look at what has happened in Denmark, which could have happened in Scotland: it is possible to make the same mistake again with renewables. The sector requires policy support with renewables and climate change targets to give the right message that Scotland is the place to develop the sector, and it needs infrastructure support with R and D and innovation.

Mike MacKenzie: Mr Marsh, do you have any comments to make in answer to that question?

Richard Marsh: I do not disagree with some of the comments that have been made, but I sound a note of caution about what Niall Stuart said. The bigger the industry grows, the more it will cost, and there are still a number of unanswered questions about how much it will cost, who will bear the costs, and how the benefits will be distributed.

Graeme Blackett sounded a note of caution about getting the policy right. We need a bit more thought about how policy will develop if we are going to push on towards meeting the highly ambitious targets.

Mike MacKenzie: So you share my optimism.

Richard Marsh: No one doubts that the potential to produce renewable energy in Scotland is huge. The questions are how much it will cost to develop it, whether it will be of net benefit to Scotland and who will bear the cost of developing the resource.

The Convener: John Wilson has a brief comment.

John Wilson (Central Scotland) (SNP): Given that the targets form the main focus of our inquiry and given that that issue has just been raised, I wonder whether the panel members believe that the 2020 targets are achievable. What might be the main impediments to achieving them? This is a fundamental part of the inquiry and, as we have heard this morning, concerns about the matter have been expressed in some, though not all, quarters.

Graeme Blackett: The short answer is that they are achievable. I am not suggesting that they will be met by onshore wind alone but, taking into account what has already been installed, what is being constructed and what is going through the planning system, I think that that and our current hydro capacity will get us pretty close to the 100 per cent target—and that is before we consider the offshore sector.

There are challenges, which, as the inquiry's remit makes clear, include the development of technology and the skills base. However, those

issues are being addressed. Everyone in the sector recognises that onshore wind will not work at the current theoretical cost and that it will need to come down; as a result, the sector has identified technological areas where it is possible to make reductions. Work in that respect is on-going and I am confident that the aim will be achieved.

Niall Stuart: In our submission, we state emphatically that the electricity target can be met, and we show the huge amount of capacity that is being scoped and planned. I will cut the numbers slightly differently from the way Graeme Blackett cut them. Taking into account what is in operation, what is being constructed and what has already received planning permission, I would say that, from what even five or six years ago was a low installed capacity, we are roughly halfway to meeting the electricity target. As a result, we are confident that we can meet it.

I have already touched on the barriers in that respect. I will not go through them all again, but will simply say that the key barriers relate to the grid, to planning and to the certainty of the market mechanism that will support investment in renewables. Graeme Blackett touched on certain technology issues; I simply note that the deployment of bigger turbines will, in itself, significantly drive down costs.

The electricity target is well understood. The Department of Energy and Climate Change has published exceptionally good statistics on electricity generation and consumption in Scotland, although the committee might want to examine the 12-month lag in their production and delivery. The same, however, is not true of heat use, particularly with regard to future projections; indeed, I think that Ian Arbon of the Institution of Mechanical Engineers has already raised that issue with the committee. There is a question about what the heat target means. Because we do not have any good forecasts for heat use, we do not know what the 11 per cent refers to.

We have no clear visibility of the pipeline of projects that will take us from roughly 3 per cent to 11 per cent renewable heat in future. There is a lack of clarity around the target, the technology that will deliver it, where it is going to be delivered and how it is going to take us there. That said, my organisation has produced some work showing that we are probably closer to the heat target than Government figures suggest, and we have suggested that we could consider raising the target in future.

Richard Marsh: When I last debated this issue with Graeme Blackett just before Christmas, I referred to the suspiciously round numbers involved. Targets of 50, 80 or 100 per cent have clearly been driven largely by politicians, not by the industry, which will take into account the kinds of issues that Niall Stuart has just outlined. Audit Scotland's good report on the likely cost of meeting renewables targets to the public purse made the clear case that the higher we push the target, the greater the cost will be. On the question whether they are achievable, persons who are better qualified than I am to answer that are present this morning.

Niall Stuart: The Audit Scotland report was on the costs of meeting the climate change targets rather than the renewable energy targets.

It is hardly a revelation that politicians set political targets. As we state in our submission, at every step of the debate on renewable energy targets, from the publication of the initial renewable electricity targets onwards, Scottish Renewables has made available evidence to support the moves that have been taken. Indeed, a Garrad Hassan report that we commissioned and published and which demonstrated that a 100 per cent target was possible formed a large part of the evidence base that convinced the Scottish Government to increase its target from 50 to 80 and then to 100 per cent. It is wrong to suggest that the industry has not had much involvement in the debate around the setting of what are ultimately—you will not be surprised to hear—political targets set by politicians.

The Convener: Indeed. I also observe that not all the targets are round numbers; for example, the heat target is 11 per cent, which is not a round number in anyone's book.

John Park (Mid Scotland and Fife) (Lab): Good morning. We have heard a bit about the jobs that will be created, but I want to ask about the people who will take on those jobs and the skills that they will need to ensure that we can meet the targets as well as compete internationally.

When he talked about some of the challenges, Niall Stuart did not mention the challenge of developing the skills base in Scotland. As far as I can see, we need to take into account two factors, the first of which is construction. There will be traditional construction jobs that will not require people to learn new skills to put the infrastructure in place; that said, Carnegie College is offering a wind turbine apprenticeship, which focuses on the implementation and servicing of renewables facilities. What measures should the Scottish Government and respective agencies such as Skills Development Scotland take to ensure that we have the right skills base to meet the targets?

Secondly, how should that burden be shared? Should the work be funded by the Scottish Government through apprenticeships in colleges? What role can the private sector play and where should the cut-off point be? We are in a bit of a

chicken-and-egg scenario, in that we are seeking to develop skills for an industry that is not quite established and whose needs are not yet clear.

Niall Stuart: We talk about renewable energy as if it is one thing, but renewable electricity is different from renewable heat and transport. Indeed, within the electricity element, the skills needs of our hydro sector will be different from those of our offshore wind sector and so on.

However, although skills needs will be different across different sectors, we also talk about renewables as if they were different from or something apart from the wider energy sector and wider economy when, increasingly, they form a major part of both. To an extent, we are beginning to see a blurring of the boundaries between those who work in construction or civil engineering and those who work in what people term renewables. That is particularly true in the oil and gas sector, in which companies increasingly class themselves as offshore engineering rather than oil and gas, offshore wind or wave and tidal companies.

Skills Development Scotland is coming at the question of future skills needs from exactly the right direction. As you have suggested, we cannot create expectations or train people for jobs that do not yet exist. SDS has taken a scientific approach to examining the skills needs of the renewables sector, the oil and gas sector and the thermal power generation sector over the next 10 years. It has broken all that down into a detailed plan of specific levels of skills from the postdoctoral level through to semi-skilled jobs in, for example, fabrication and everything in between, and it is actively working with the Scottish Further and Higher Education Funding Council, colleges and universities to ensure that the right numbers of training places and the right resources are available at the right time to develop the industry. In that respect, we have got the balance about right.

10:45

The fact is that we are going to need people of all ages and with all types of experience to grow the industry in the way we hope it will grow. Companies such as the Weir Group and the Wood Group are working with existing employees to transfer their skills from other, more traditional sectors into the renewables sector.

Finally, you have probably seen reports in this week's press about the huge volume of applications that Scottish Power has received for apprenticeships in their networks business. That reinforces my impression that young people are excited about and want to be involved in the sector and will take the opportunities that it presents.

John Park: I hope that they will still be recruiting around the time of the next election—you never know what might happen.

Niall Stuart: We will keep you in mind, John.

John Park: I am all for adult apprenticeships.

When the economy was in a much better condition, there were many skills shortages in Scotland and there was a lot of competition for skills in different areas. I acknowledge your point about the blurring of the edges between other types of energy and renewables, but the hope is that, over the next few years and as we get into the middle part of the decade, other opportunities will arise not just in renewables but in energy production and supply. What implications might that have for skills needs? To the best of your knowledge, have the Scottish Government and SDS been considering the issue?

I will give you an example of what I am talking about. Tullis Russell is building a biomass plant in Glenrothes. Despite the lack of opportunities in the construction sector, and even though the economy is nowhere near the level of growth that we would expect over the next few years, I know for a fact that the company has had to import overseas labour because of the lack of skills in the area. Do you think that external factors are going to have a direct impact on our ability to have the right skills mix to fulfil the potential of renewables?

Niall Stuart: In certain areas—including, I believe, electricity networks—there is already anecdotal evidence of pressure on parts of the supply chain with regard to the availability of necessary skills. If we are successful in bringing to Scotland large overseas manufacturers—such as Samsung in Methil and Gamesa, we hope, in Leith—the creation of several hundred jobs on one site will put pressure on the local labour market and will require a fairly detailed and heavy intervention from Skills Development Scotland and others to ensure that those demands are met.

As for the Tullis Russell project, which is the only project of its scale in Scotland—indeed, it is one of the very few projects of its type—the issue is less the lack of individual skills or skills in the construction sector than the fact that our business base and construction industry do not yet have experience of such projects. However, I know from talking to civil engineering companies, construction companies and engineering consultancies that they are aware of the likely increase in biomass and anaerobic digestion projects and are pulling in the skill sets and industry partners that they will need to meet future demand.

It is not so much an issue of individual skills as simply that our business base does not have experience of that type of project yet. However, it

will get it, and it will be far better equipped to bid for such contracts in the future.

Graeme Blackett: There are also some good examples in the sector of the private sector and the public sector working together to develop skills. In many projects, the developer has signed up to an agreement that a certain proportion of employment will be available as training places for youngsters, whether that is in the vicinity of the development or in the wider area. There is a role for both industry and public agencies in highlighting those examples of good practice and encouraging greater take-up in the sector as a whole. It is in the interests of the industry as well as of the policy makers to maximise the local benefit of such investment.

The Convener: Before we leave the issue of skills, I raise an issue that Professor Ian Arbon raised at the round-table meeting that we held back in November or December—Niall Stuart was there. On behalf of the Institution of Mechanical Engineers, Professor Arbon expressed concern that there will be a handicap in meeting the targets because we simply do not have enough qualified engineers with the skills required in the country. Do you have a view on that, Niall? Is that an issue for your members?

Niall Stuart: Over the next 10 years, there is going to be pressure in the science, technology, engineering and maths—STEM—subjects as a whole. The Scottish funding council and Skills Development Scotland are aware of the likely increase in demand and, as far as I know, they are starting to divert extra resource to support further and higher education opportunities in those areas. Your question would probably be better addressed to Skills Development Scotland, which has intelligence on the projected future development of the labour market and how universities and colleges are responding to that. The biggest anxiety in the sector is at the technical, craft and tradesman level.

The Convener: Okay. We will move on to a different topic.

Mike MacKenzie: I compliment Niall Stuart on his written submission to the committee, which is comprehensive and lucidly argued. In talking about barriers to realising our opportunities and meeting the targets, you touch on the issue of transmission charging. You will understand that, as a member for the Highlands and Islands, I have been concerned about the historical situation. I welcome—as far as it goes—Ofgem's suggestion that the situation should be equalised a bit, but I remain concerned about the situation of islands. Would the panel like to comment on that?

Niall Stuart: I do not know whether I have an awful lot to say beyond repeating the points that I make in my written submission. We believe that what Ofgem proposes is a step forward in terms of the cost to generation on the Scottish mainland. Ofgem has published indicative tariffs, and we are working with it to understand what the tariffs are likely to be when they are finalised. Our biggest concern is that, for example, a wind development in the Western Isles would pay almost 10 times as much per unit of installed capacity as would be paid by an equivalent wind farm that was close by on the Scottish mainland or even on another island such as Skye.

We understand that those levels of charges make the development of onshore wind uneconomic in the Western Isles, Orkney and Shetland, and we believe that that is a missed opportunity in progressing towards the targets. About 1GW of onshore wind generation that could go ahead will not go ahead because of those levels of charges, which is also a blow to the communities of the islands that are involved in the projects, including the Viking project and Stornoway wind farm. It is also bad news for consumers, because that 1GW of capacity is likely to be replaced by 1GW of offshore wind generation as we progress towards the UK targets, which—as has already been outlined—is more expensive and will place additional costs on consumers.

We believe that Ofgem has got its proposal on island charges wrong. We do not believe that it benefits the communities in the Western Isles, our climate change targets or our progress towards a low-carbon energy mix, which is what project transmit was designed to achieve, and we do not think that the recommendations are in the best interests of consumers, either.

Mike MacKenzie: The issue is obviously reserved to the Westminster Government, but are you aware of European Union directive 2009/28/EC, which relates to the matter? If you will permit me, convener, I will briefly read from article 16 of that directive, which states:

> "Member States shall ensure that the charging of transmission and distribution tariffs does not discriminate against electricity from renewable energy sources, including in particular electricity from renewable energy sources produced in peripheral regions, such as island regions, and in regions of low population density."

Our friends in the fourth estate are often all too keen to point out when the EU is a bit of a bogeyman; we often read stories about EU bananas having to be straight and all the rest of it. Do you agree that in this instance the bogeyman is not the EU, but the UK Government?

Niall Stuart: What Ofgem has published is its draft conclusions from the relevant stage of project transmit, which has gone through several iterations. All interested parties now have a

chance to respond to the proposals, and we have highlighted that the charges for the islands make development uneconomic, which has a number of negative consequences that are at odds with Ofgem's aims and objectives.

We also said clearly in our submission that there is a risk that what is proposed will be inconsistent with the EU directive that you cited. It would mean not just that charges were higher in the island groups that I have mentioned but that the way in which those charges were calculated would be different for those island connections. The consistent application of a process that results in different charges for different parts of the UK is not inconsistent with the directive, but the application of different charging methodologies to rural peripheral areas such as the islands could be inconsistent with it.

Mike MacKenzie: I have just one other brief question, which touches on an inhibitor that Niall Stuart has already mentioned—the prevarication of the UK Government in introducing the RHI and, in particular, the domestic RHI. Given that the controversial proposed changes for feed-in tariffs for solar photovoltaics have recently been successfully challenged in court, are you concerned about the lack of confidence that that creates in microgeneration technologies, particularly for smaller installers, as well as about its inhibiting effect for smaller local businesses to get microgeneration certification scheme approval? Do you agree that yet again the UK Government seems to be the bogeyman?

Niall Stuart: I thought that you might try to get me to say that word again.

We have two concerns about the RHI. The first is the delay in its implementation for households and domestic customers and the uncertainty that that has created. Our other concern is that the proposed levels of support have come down significantly as a result of European state aid rules.

The biggest opportunities are at the smaller end of the market for commercial properties—1 to 5MW—but our analysis suggests that the new levels of support through the RHI for the 1 to 5MW band are not sufficient to take forward developments at that level. We are arguing very strongly not that one size should fit all but that there should be a bespoke band for that smaller end of the sector that makes investment in renewable heat at that level economic.

Graeme Blackett: Perhaps that raises a more general point about the policy environment. Sudden changes in policy such as those that Mike MacKenzie mentioned are not welcomed by industry and can have perverse effects.

The Convener: Such as changes in the constitutional arrangements, for example.

11:00

Chic Brodie: Looking at the finances, the point was made that, if there were more offshore wind turbines, the cost of electricity would go up. However, that assumes that nothing will happen to increase the cost of the provision of energy in the world as it is today.

The submission from Scottish Renewables mentions subsidies across the spectrum of energy supply. We should either confirm or debunk myths about subsidies. Niall Stuart's submission pointed out that

"coal, oil and gas prices in the UK were subsidised by £3.63bn in 2010, compared to £1.4bn of support for renewables ... the annual cost of nuclear decommissioning ... is estimated to be £2.9bn. This compares to £1.1bn of support to the renewables industry".

That does not take into account the fact that the whole nuclear industry is not fully burdened with the cost of insurance of nuclear power stations, as I read recently.

Will you destroy or validate the myths about renewables costs and subsidies versus those for existing fossil fuels?

Graeme Blackett: I am sure that you have received summaries of the information from SPICe. However, pages 48 and 49 of a report published earlier this month called "Energy in Scotland", which is a summary of energy statistics produced by the Scottish Government, include a good summary of what has driven domestic electricity bills over the past few years.

That makes it clear that the big driver has been an increase in fossil fuel prices and that, although the cost of renewables obligation certificates makes a contribution, it is relatively modest in the context of fossil fuel prices. It works out at about £20 per domestic bill and the figure is predicted to go up to about £50 by 2020. When we compare that with a system that is more reliant on fossil fuel bills, the work done by the Department of Energy and Climate Change predicts that bills would be even higher if we relied on fossil fuels, given the possible future increases in fossil fuel prices.

Niall Stuart: I do not have a huge amount to add to our comments in the submission, which Chic Brodie summarised. There are people who want the industry to fail and want the industry not to meet the targets. Perhaps the myths show that opponents of renewable energy are prepared to clutch at straws and put out unreferenced, unargued and unevidenced information that is not consistent with the accurate evidence that is coming forward from, for example, the Committee on Climate Change, which clearly identified the

increase in gas prices as the main driver of increases in households' energy bills, despite what you read in the papers and in some reports from people who oppose renewables and oppose action to tackle climate change.

I will make two other points. First, fossil fuel prices are likely to go only one way, whereas the cost of renewables is likely to come down over time. Secondly, analysis by DECC shows that, by 2020, when there will be a greater penetration of renewables in the system, renewables will start to push down and suppress the wholesale cost of electricity, because of the competition that they will bring into the electricity market.

Chic Brodie: Do you have any comment, Mr Marsh?

Richard Marsh: Some fair points have been made about the fact that we should all be concerned about the general increase in energy prices. We need to take action and the issue is how we structure it, what the cost will be and how to get the policy right.

Chic Brodie: I have a final question on a related issue, which is security of supply. We are looking at meeting targets by 2020, but it is clear that the following issue will have an impact on more immediate costs. We understand that, if the Chinese and Indians keep building nuclear power stations at the rate that they are doing, there might be full depletion of uranium in 40 years and gas might increasingly need to be supplied from places such as Russia. Do you agree that those issues will have short-term implications for the current supply of electricity?

Niall Stuart: Yes. Renewables are one of the ways in which we can mitigate some of the impacts. I do not have the figure to hand but, at some point in this decade, the UK will go from being a country that produces more energy than it imports to being a country that imports more than it produces, so the effects will become only more exaggerated over the next 10 years.

Graeme Blackett: The other development that is relevant is the desirability of greater pan-European co-operation on energy, so that we can get to the point where we have almost a pan-European market. That will create the diversity in the supply that will allow people to import and export electricity based on the supply and demand conditions in each country.

Patrick Harvie: I have a question on a slightly different topic. Are we missing a trick with regard to the role of the public sector? It could be much stronger, particularly at the local council level, on issues such as investing in smaller-scale renewables that use public land and public buildings. In rural areas that might mean wind; in urban areas that might mean district heating or a host of other technologies that might be appropriate in various places.

The public sector could also play a role by becoming a bulk buyer and domestic supplier of energy. The profits, rather than going into the hands of the big energy companies, could be invested in further deployment of renewables and in demand reduction. Another role that the public sector might play is investing in changing the way in which we build the urban environment in order to facilitate electric charging points and other aspects of the transport agenda, as well as heat.

Graeme Blackett: I would characterise such initiatives as market development initiatives. There is a role for the public sector in investing to demonstrate the feasibility of technologies in new markets, such as electric transport, so that other people will be encouraged to invest. From a public sector expenditure point of view, that is almost an invest-to-save initiative, which has a double benefit. It is a good example of an area in which we would encourage public sector agencies not to think in silos but to think about policy across their areas.

Patrick Harvie: That would help to create the perception that the agenda does not serve simply to benefit the balance sheets of some big companies but serves the public good.

Graeme Blackett: Yes.

Niall Stuart: I agree with what Patrick Harvie said. I have already touched on the fact that the public sector will have to drive forward district heating and renewable heat. The public sector has a huge bill at stake and a huge amount of roof space and land that it can use for smaller-scale technologies. The national health service, education institutions such as universities and so on should all be thinking about using biomass and small-scale renewables to provide heat and power.

Equally, I would not overlook the huge potential, due to the change in legislation a couple of years ago, for local authorities to generate electricity and sell it to the market directly. Local authorities own huge tracts of land that could be used to promote not only small-scale developments but large-scale developments for onshore wind and hydro.

Jim Eadie (Edinburgh Southern) (SNP): The issue of barriers to achieving the 100 per cent target has been raised already. We heard about grid charging, but I will ask about access to the grid. We need to ensure that we have the network capacity that will allow the export of renewable electricity to the rest of the United Kingdom and Europe. That was highlighted in the submission from Scottish Renewables. What further measures need to be taken by Ofgem, the UK Government and the Scottish Government to ensure that

companies and investors have the required certainty over the design, delivery and costs of grid connections to enable us to meet our targets?

Niall Stuart: If I had been asked that question 12 months ago, I would have said that the issue of access to the grid was a big risk to the target and a big area of uncertainty in relation to it.

Jim Eadie: Indeed, you say that in your submission.

Niall Stuart: Today, the picture is very different. The electricity networks strategy group has produced a blueprint of the grid that is required for the UK to hit the level of renewable electricity that is required to meet its 15 per cent EU target. That echoes the business plans that Scottish Power and Scottish Hydro Electric Transmission have submitted to Ofgem, which Ofgem has said that it will fast-track through its decision-making process.

In effect, we have a blueprint of the connection required for the UK to meet its renewable electricity objectives, which include the 100 per cent target for Scotland. Those plans are enshrined in Scottish Power's and SSE's business plans for 2013 to 2021. The additional capacity will give Scotland some 11GW of interconnection with the rest of the Great Britain system—a factor of several times what it has today. The transmission upgrades have been signed off by Ofgem and the contract has been placed for the first of the upgrades, which is the west-coast high-voltage direct current subsea interconnector—the bootstrap.

The three announcements that I have described are hugely significant and give us far more confidence that the necessary grid will be in place in 2020. I guess that the big risk to the upgrades now is in the planning system. We would push hard for the Scottish Government to ensure that the additional grid upgrades that have emerged since national planning framework 2 are captured in national planning framework 3.

Jim Eadie: That is a very helpful update. Do the other witnesses have anything to add?

Graeme Blackett: A longer-term issue than the one that Niall Stuart mentioned is the European dimension. We encourage the Scottish and UK Governments to try to get long-term planning for the development of more connections across Europe up the agenda at the European level.

Jim Eadie: Mr Marsh?

Richard Marsh: I have nothing further to add.

The Convener: I thank our three witnesses—Richard Marsh, Graeme Blackett and Niall Stuart—for giving evidence and taking questions.

11:13

Meeting suspended.

11:19

On resuming—

The Convener: Our second panel is Aedán Smith, head of planning and development at RSPB Scotland; Helen McDade, head of policy with the John Muir Trust; Stan Blackley, chief executive of Friends of the Earth Scotland; and Richard Dixon, director of WWF Scotland. Welcome to you all and thank you for coming. Before we get into questions, does any of you want to make an introductory statement?

Stan Blackley (Friends of the Earth Scotland): Good morning, ladies and gentlemen. I am the relatively new chief executive of Friends of the Earth of Scotland, which has heritage and expertise in the issue that the committee is discussing. We have been campaigning on the promotion of renewables for several decades. However, I have not been, and I am not a technical expert on the issues, although I would wager that I know a little more about the Scottish context than Donald Trump might.

In the past six years, three of the organisations that are represented on the panel—RSPB Scotland, Friends of the Earth Scotland and WWF Scotland—have worked together to produce a series of reports under the title "The Power of Scotland". For the most recent of those, "The Power of Scotland Secured", research work was undertaken on our behalf by GL Garrad Hassan, which we believe to be the leading experts in renewable energy in the world, and which was represented at the committee's round-table discussion in December. On our behalf, Garrad Hassan came to the conclusion that, without endangering important environmental interests in Scotland, renewable electricity generation can grow to comfortably exceed our electricity needs and bring in substantial export revenue.

The report shows that, through modest energy efficiency and demand reduction work—we argue that less than 8 per cent is required, whereas the Scottish Government's and the Committee on Climate Change's targets are in the late teens or 20s—Scotland could produce 130 per cent of its electricity demand by 2020 from renewables and up to 185 per cent by 2030. In doing so, we could decarbonise at least 50 per cent of our total energy needs. I think that members have all seen the report, but if you have not, I am happy to give the clerk copies to distribute among you. It is also available on all three organisations' websites.

The report shows that, with improved interconnection and moderate investments in storage and deferrable demand, Scotland could

phase out all conventional thermal energy production and capacity before 2030 and still deliver a secure and reliable electricity supply. Members will be pleased to hear that I will not say more on that now, but I highly commend the report to the committee.

Helen McDade (John Muir Trust): I thank the committee for allowing me to address it. I was at the committee's round-table meeting in December. As members probably know, the John Muir Trust is about protecting wild land and getting people to value wild places. We approach the issue starting from the fact that there is no doubt that, as Scottish Natural Heritage statistics show, wild land and natural heritage are being severely impacted by the roll-out of onshore wind and could be very severely impacted if some of the worst schemes go ahead. We have quite a lot of expertise in strategic energy issues. We have taken a lot of advice from experts and spoken to engineers and various institutes.

I will comment on a few of the points that have been mentioned. Stan Blackley mentioned "The Power of Scotland Secured". The John Muir Trust does not dispute that the renewables target is achievable. I am pleased that the committee is considering the link between the target and greenhouse gas emissions reductions. It is critical that we remember the top-line strategic aims. It is slightly unfortunate that the energy and climate change remits have been given to two committees of the Parliament. I hope that there is a way of bringing the two committees together to consider the issues.

Our concern is that the target could be achieved without achieving the main aim—to reduce greenhouse gas emissions and produce a secure energy supply—while impacting heavily on our natural heritage. The report that Stan Blackley referred to talks about "designated" sites. That is the reason why the report might be true and why what I say is also true. Many of our natural landscapes are not protected and do not come under that criterion.

The key thing to remember is that energy conservation is the best and cheapest way in which to achieve greenhouse gas emissions reductions. The question that we must ask is whether the current renewables target and the way in which we plan to meet it will achieve that in the best way.

Niall Stuart referred to a number of key points. One is about Ofgem. It is interesting that Ofgem has fast tracked the transmission work. It has a consultation out on that, but there are people who look at the way in which the measures are being brought forward and wonder at what point the issue will be considered rationally. The issue of how much of the transmission work should be commenced is under consultation. We are talking about billions of pounds from consumers. Again, we need to look at the join-up between Scotland and the UK, but the matter is for the Scottish Parliament under the national planning framework. The issue is interesting, as again we see that something that was said appears to have been forgotten later. When the 11 transmission upgrades were included in national planning framework 2, I asked how the strategic environmental assessment looked at that, and was told by the person who had been involved, "Well, of course, it's incredibly sketchy, because we don't have the information. It will need to be looked at again." Now that those upgrades are a national development and are in the national planning framework, people might forget that, and it is the Scottish Parliament's role to come back to it. That is not automatically the best way to go. A huge amount of money is involved.

What "The Power of Scotland Secured" says is perfectly true. We could do all this and not have conventional back-up. We will have to have conventional back-up somewhere else, of course, but it will be in England and France. Therefore, we question the underlying assumptions while we are still trying to achieve greenhouse gas emissions and retain our heritage.

Aedán Smith (RSPB Scotland): I am head of planning and development for RSPB Scotland, so I co-ordinate our involvement in individual project proposals across Scotland.

It is probably worth spending a couple of minutes explaining why RSPB is interested in energy in particular. A main driver is that we know that climate change is affecting birds in Scotland and the rest of the world, so we are working hard to try to reduce its effects. One obvious solution is to reduce our greenhouse gas emissions through renewable energy, but we know that individual renewable energy developments that are put in places which are good for birds can be directly damaging for them. Therefore, we need to ensure that individual developments are sited to avoid the most important places for birds.

That is one reason why we contributed to "The Power of Scotland Secured", to which Stan Blackley referred. As Helen McDade mentioned, part of the analysis in that report showed that we could meet our targets without impacting on sites that are designated for their biodiversity interest. That has given us confidence that we can meet those targets without damaging our most important places for wildlife.

We know from international examples that if developments are badly located, they can certainly be damaging. There are quite well-publicised international examples of developments that are causing harm for biodiversity. Therefore, we need

to carefully assess proposals individually and collectively. That means that we have been involved in almost every major wind farm case in Scotland, for instance, so we have very good experience of cases throughout Scotland.

Generally speaking, individual proposals do not tend to pose a problem, although it can take quite a while to come to that conclusion. That is illustrated by statistics that we pulled out from our recording system yesterday. Between 2001 and 2010, we were involved in more than 2,100 wind farm cases across the UK and objected to only 8 per cent of them. That illustrates that the majority of individual developments are not a major problem for birds or other wildlife as long as they are in the right place.

11:30

Richard Dixon (WWF Scotland): WWF is the largest environmental organisation in the world. We are concerned about climate change, because it is the biggest threat to people and nature around the world. The two biggest things that we can do to tackle climate change are become energy efficient and use renewable energy. That is why we are interested in renewable energy.

Obviously, Scotland has a special part to play, as we have huge renewable energy resources, and we have a moral obligation to exploit those resources by putting the right renewables in the right places. I have worked on that for almost two decades and think that it might be instructive to briefly go through the history of renewable electricity targets in Scotland.

In 2002, when Sarah Boyack was the environment minister, she announced a 17.5 per cent renewable electricity target by 2010. That was only 5 percentage points up from where we were—we already had around 12.5 per cent big hydro electricity—over eight years, but her civil servants nonetheless said, in a very Sir Humphrey-esque way, “That’s very brave, minister. Are you sure that you really want to do that?” She made that announcement nonetheless, and all credit to her for that. At the time, the industry said that it could probably produce 25 per cent by 2010; the actual figure in 2010 was somewhere over 30 per cent. Therefore, Sarah Boyack’s target was an increase of 5 percentage points from the status quo, but what was achieved was an increase of 20 percentage points from the status quo, which was four times what she thought was possible and was told was very brave. We therefore have a history of underestimating how ambitious we can be.

The Labour and Liberal Democrat Administration suggested in 2006 the first target for 2020, which was 40 per cent. When the SNP came to power in 2007, it upped the target to 50 per cent, and it upped it again to 80 per cent in 2010. In the most recent election campaign for the Scottish Parliament, there were promises of 100 per cent from the SNP, 80 per cent from the Labour Party and more from the Greens and the Liberal Democrats. All parties were very ambitious, which is how we have ended up at the 100 per cent target. As Stan Blackley mentioned, our report suggests that we should perhaps aim for 130 per cent but, for the moment, 100 per cent will do me. However, as I suggested, the history shows that, because technology develops, the reality outstrips even the political gaming to get the right number in a manifesto.

The Convener: Thank you for that history lesson.

Rhoda Grant (Highlands and Islands) (Lab): I am keen to learn what the panel thinks about our heat and electricity renewables targets and their impact on the CO_2 emissions target, and what else we can do to meet our emissions target.

Richard Dixon: A parliamentary answer in 2011 gave some UK Government figures for the amount of CO_2 that our current renewable electricity generation saves in Scotland. The figures for 2010 are that renewable electricity saved 5.6 million tonnes of CO_2, which is about 9 per cent of the emissions that we had in total from every sector in 1990. Nearly 10 per cent of all our emissions are now gone because we have renewables, which is very good.

Garrad Hassan has predicted that, if we meet the 100 per cent target, we will save about 13 million tonnes of CO_2. That is a pretty credible number, which represents about 21 per cent of all the emissions from 1990. Therefore, the fact that we have transferred to green electricity will achieve half of our 42 per cent target by 2020.

I calculated roughly that the 11 per cent renewable heat target translates into about a 5 per cent reduction on the 1990 level of emissions. Again, that is a significant contribution, although the renewable heat target is only 11 per cent of our total heat demand.

Both our heat and our electricity renewables targets make considerable contributions. Clearly, though, there are other areas in which we need to do more. Transport is probably the key one because we have not really got a grip on CO_2 emissions from that sector and we need to do more. Part of that is about not letting traffic grow at the rates at which it is predicted to do—there was a previous target to stabilise traffic levels, which we have forgotten about but to which we need to return—and part of it is about the kind of vehicles. We need more efficient vehicles, but we

particularly need a transition to electric vehicles from the current diesel and petrol ones.

Helen McDade: It is important to talk not just about renewables but about the different technologies. Obviously, heating is key in that regard. We do not work on that area a lot, so I am quite happy to defer to Richard Dixon's knowledge of it. However, the main point is that we should use heat when it is produced rather than produce electricity from it and then produce heat from that. That is a question that needs to be looked at. Burning up stuff to produce electricity and then going back and producing heat is not efficient. Using biomass for heating is an obvious thing to consider. That involves planning how we build our new houses and having district heating and combined heat and power. I do not think that such issues get proper attention, which is probably partly because of the great difference between the UK and the Scottish responsibilities and where money is available.

The key point is that energy conservation is the most effective way to achieve reductions in greenhouse gas emissions. To get money for that, we would need to transfer some money from paying for ways of achieving the renewables target that are perhaps not so efficient and therefore risk not getting the gains that we want from the greenhouse gas emissions reductions.

The Convener: As I said to the first panel, please do not feel that you all have to answer every question, because we could be here for quite a long time if you do. However, I will let you off seeing as this is the first question.

Aedán Smith: Demand reduction and energy efficiency measures are also critically important factors. The RSPB has done a lot of work on emissions from other land use sectors, but I do not think that we have provided it to the committee, although we could do that if the committee thinks that it would be useful. Emissions from other land use sectors will be a significant factor in whether we meet our greenhouse gas emissions reduction targets. Scotland could make a difference in that area because we have a high proportion of rural land in our country. We are doing a lot of work to restore the peatlands in Caithness and Sutherland and ensure that they are not net emitters of greenhouse gases. I do not have a massive amount of information about that work with me today but, if it would be useful, I could certainly pass it to the committee.

Stan Blackley: With regard to the idea that we should take some of the money that is being invested in renewables and move it into energy efficiency effort, our organisations agree completely that the focus needs to be on energy efficiency. That should be the number 1 thing that we do. Quick, easy and cost-effective action can be taken on energy efficiency.

However, within the next few months, carbon tax revenues will come on stream. An energy revolution campaign is now calling for the £4 billion in carbon taxes that will be raised over the next 15 years through the EU emission trading scheme and the carbon floor price to be reinvested in energy efficiency measures, particularly warmer homes and lower fuel bills. If we did that, we would not have to ask for money from any other sector or from the developments that are taking place, and we could create 200,000 jobs and take nine out of 10 people in the UK out of fuel poverty. The money is there for energy efficiency, so I argue that the money that is being used to develop renewables should be focused on renewables.

Rhoda Grant: The witnesses in the first panel felt that the renewable heat targets are not ambitious enough and that those targets have potential to reduce our carbon emissions further than our electricity targets will. I am also interested in what Helen McDade said about using biomass. I understand that it is better to use wood products as a carbon store than to use them to generate renewable energy. What do the witnesses think about the heat targets and how we use biomass?

Richard Dixon: As Scottish Renewables suggested, it is thought that we are ahead of where we have to be on the curve to meet the 11 per cent target for renewable heat. Some sectors are doing better than others. Housing is not doing so well; the industrial side is doing better. There is scope to increase that target.

We have done a piece of work that has not been published yet that suggests that we need to drive the housing side faster, for example by people installing heat pumps or some other renewable heat technology in their houses, if we are to meet the targets that are in the report on proposals and policies under the Climate Change (Scotland) Act 2009, and we need a tougher target. It looks as if we doubled the amount of renewable heat in the past 18 months, which is well ahead of where we expected to be. We are now at 2.8 per cent and heading for the 11 per cent target. To drive a sufficient incentive in the domestic sector, we need to set a higher target approaching 20 per cent overall, not just for the domestic area. That would drive the change in the domestic sector.

As Helen McDade suggested, district heating is an important part of making progress on the issue. There are many barriers to district heating because the planning system is not generally friendly towards complex things such as that. Commercial agreements will also need to be made between an energy producer, a housing developer and a set of companies on an industrial estate. It

is difficult for them to see certainty in the market. Although electricity is closely regulated, the heat market is unregulated, which also leads to a lack of certainty. When a company signs a deal to produce a certain number of megawatts of power in the form of heat, it is taking a risk by signing a deal with someone who might go bust tomorrow and not buy the heat any more. We need to do quite a bit to make it happen. The district heating element is very important as well as domestic scale renewable heat.

The Convener: What about biomass?

Richard Dixon: There are lots of useful applications for biomass on a local scale. Biomass is a useful renewable energy source because people can say, "The wind isn't so strong today, so I'll need some extra power—I'll fire up my biomass boiler." It is quite flexible, as long as people have some warning.

We are not keen on large power stations running on biomass, but we are interested in schemes such as the Tullis Russell scheme, which John Park mentioned. We are interested in small-scale embedded schemes that will help the whole of Fife, for example, or the whole of another part of Scotland. It seems sensible to have a number of those schemes across Scotland, as long as they use sustainably sourced timber from Scotland. If we have to import large amounts of timber, that is potentially a problem both in terms of the standards under which it was produced and because we will be taking that timber away from someone else who might have done something useful with it. There are competing uses for timber, so there is only a certain amount of timber available for biomass, but there is enough to enable us to do something sensible with it and fit it into our energy system.

Aedán Smith: I agree with everything that Richard Dixon just said, but a large demand for biomass has implications for biodiversity. Small-scale biomass plants that use timber that is sourced locally from well-managed, sustainable woodlands and forestry could be positive for biodiversity. We do not have any particular concerns about any individual proposals that are currently in the system in Scotland. However, the collective potential of all the proposals that are currently out there to create a large demand causes us concern. The potential implications for biodiversity of starting to import biomass internationally will be significant. It will also become unclear whether biomass has carbon benefits, because of the impacts on the forestry and woodlands from which the timber may be taken.

We have worked with our partners in BirdLife International on the issue, and a report is available that is very useful in setting out some of the problems with forestry biomass. I will send the committee a copy of that report. There is also an issue with biofuels being grown for the transport sector, which can have serious implications for biodiversity internationally. We can send you more information on that, too.

Helen McDade: I was referring primarily to small-scale, community schemes. On our Strathaird estate, over previous years, we have been clearing out some commercial forestry and have tried to establish a local distribution network. We have been encouraging people to install biomass boilers—we have done it ourselves as a demonstration—and that is what I was thinking about. We very much support the Scottish Government's view that large-scale biomass would need to be for combined heat and power, using the heat.

Rhoda Grant: I have a brief supplementary question on transport. How will the move towards decarbonising transport and substantially increasing the number of electric vehicles on the road affect our renewable electricity target?

Richard Dixon: Two things will potentially mean that we will use lots more electricity: the transition of transport to electricity and the transition of heating to electricity. On the transport side, we have done a piece of work on how we can meet ambitious targets on electric vehicles. To have 300,000 electric vehicles—about 11 per cent of the whole fleet—on Scotland's roads by 2020, with traffic stabilisation, will not require any more generation capacity, as the vehicles will mostly be charged at night, when we will have spare electricity from nuclear generation and from wind if it is blowing hard enough. We can do that with very little pain. Even if we had a strong transition to electric heating as well, meaning an increase in demand of around 7 or 8 per cent, the written evidence from Scottish Power—which the committee has, I think, just received—suggests that, although there might be local problems, both of those things would be manageable up to about 2030 without significant problems. The argument about electric vehicles is sometimes overstated.

11:45

Patrick Harvie: Picking up on the point made by several witnesses that we should shift our focus from increasing renewables—and from a target that the John Muir Trust says in its submission is "excessive"—to making demand reduction the priority instead, I hope that everyone will recall that I have a track record in working on efficiency issues in the Parliament. Indeed, in the previous session, we found ourselves unable to support a budget—and knew that in doing so we were taking a risk with our political party—because we felt that

demand reduction was an important issue. It is certainly not an issue that I need to be sold on.

That said, even if we were really ambitious and achieved a 30 per cent cut in projected energy demand—which would take a great deal more effort than we are making at the moment—the energy still has to come from somewhere. In its written submission, the John Muir Trust argues that one of the problems with the renewables target is that, even under the Government's plans, a substantial element of energy will still come from conventional electricity generation. Is it not clear that, if we do not have that increase in renewable energy generation, all the energy will have to come from conventional sources of generation such as fossil fuel and nuclear? Which is it to be?

Helen McDade: It is not about renewables. What I actually said was that achieving the renewables target primarily with industrial-scale wind generation would be a pyrrhic victory. As has been mentioned before, we need to differentiate between the different types of renewables generation—they are not all the same. It is like saying that coal and oil are the same thing. The problems with needing conventional back-up apply particularly to wind generation.

On your question whether all the energy has to come from conventional sources of generation, the point is that the target is driving us to produce far more electricity than we are going to use. It is based on various assumptions. One example cited is that of Denmark, 20 per cent of whose electricity consumption demands are met by renewables. However, in the year I have seen quoted, it used only half of that energy; sold—or even gave—the rest to Norway to carry out the kind of pump storage activity that it is in a great position to do; and then bought the energy back at a higher price. Coming back to the previous panel of economists, I have to say that the question is how much it is worth overdoing one particular technology.

I quite take your point that we cannot conserve all energy. However, we can do a lot with energy conservation. It is all about what we get for our buck. To me, it is like going to a national health service hospital for a hip replacement and being told, "We've got three kinds of replacement. One is very good and doesn't cost much; one is not so good, has caused problems in the past and costs a bit more; and one is really not very good and costs quite a lot. However, we need to have a balanced mix and I'm afraid you're getting the one that's not so good." We want the best kind of renewables production available and we would argue that the renewables obligation is not helping in that respect.

If, as we keep being told, technology is moving on—indeed, Niall Stuart sat here and said as much—why are costs to consumers not going down? It is all to do with the artificial market that the renewables obligation has created. We are in favour of renewables and the best possible production of renewables, and we believe that public money should be focused on research and development in, for example, carbon capture and storage. Given the global situation, we have to do something that helps other countries or something that other countries want to take on; otherwise we will simply not do much about reducing global greenhouse gas emissions.

Patrick Harvie: I suspect that we would all like to snap our fingers and deploy a lot of wave and tidal energy generation tomorrow. However, that is simply not possible. If we are going to achieve the interim 2020 greenhouse gas emissions target, we need to use technologies that we can deploy right now to displace conventional energy generation. We do not have carbon capture and storage, so we cannot justify an increase in fossil fuel combustion. What does the John Muir Trust think that we should be doing right now to achieve the greenhouse gas emissions target in the energy sector, if not through using the renewables technologies that are mature and can be deployed?

Helen McDade: If, as you say, the technology is mature, why does onshore wind need the subsidies that it gets and why is it not very efficient? I do not agree with you that we should not be putting far more into research and development; we simply do not believe that what we have at the moment will make the necessary reductions in greenhouse gas emissions in Scotland. We will still have conventional generation and, if we do not, it will be because we are taking French nuclear energy and English coal energy from south of the border.

Patrick Harvie: My question, though, is this: what will make the necessary reductions in emissions? What currently available renewable energy technology or other energy technology would the John Muir Trust like to see replacing the onshore wind element of renewables as we approach 2020?

Helen McDade: You hit on a key point. It is not for all of us to come up with our favourite range of technologies. It would be a good idea if we got an independent panel of experts to look at the most effective way of achieving the necessary reductions. We are in favour of a national energy commission—which the engineers are also calling for—as it would mean that figures would be produced on what each of the energy production methods produces. It is not for the John Muir Trust to call for 20 per cent to come from this source and 40 per cent from that source. It is for us to call for a national energy commission, and I really hope that the committee will look at that.

Patrick Harvie: Sure, but are you saying that, for the next few years, when Scottish energy ministers are asked what Scotland's energy policy is, they will have to say, "I don't know"?

Helen McDade: I think that they do not know. I think that the engineers are asking big questions—members should read the submissions.

Chic Brodie: We keep being blown towards talking about wind, but I would like to talk about another source—energy from waste, in which the UK Government has indicated that it intends to make substantial investment.

What is your position on anaerobic digestion plants and whether the planning background supports them?

Stan Blackley: We certainly take a position on energy from waste. In our report, we have kept with the convention of factoring it in but, as an organisation, we have grave doubts about whether certain types of energy from waste should feature as part of the future of renewables or even whether they should be classified as renewables. We have no problem with pyrolysis of organic waste, but Scotland also has ambitious zero waste targets to meet, and much of what is being proposed by developers across Scotland is contrary to those. If we lock ourselves into a model in which we need a 25-year supply of waste for burning to produce heat or electricity, we will not get far in reducing the waste that is made in the first place, because we will be locked into supplying it.

We have grave doubts about whether waste to energy should form a significant part of the future energy supply, but the issue is about scale. You will hear a lot from us about appropriate scale, sensitive siting and so on. There is a small role to be played by such technology, albeit that the issue is sensitive from the point of view of scale and appropriate siting, but, in our view, it should not be a major part of the mix.

Chic Brodie: I have another question. We have heard recently about the view of certain individuals on the impact of wind turbines on tourism and the landscape. In the past three weeks, I have attended tourism partnerships across the south of Scotland, all of which are talking of reasonable growth in tourism. No mention was made of turbines, so why do some people think that turbines have a negative effect on tourism? I should say that, in the past year, tourism in Scotland has grown by 8 per cent.

Helen McDade: The Scottish Government-commissioned study "The economic impacts of wind farms on Scottish tourism", which was published in 2008, is often cited as supporting the position that you have outlined.

Chic Brodie: That is why I mentioned my recent meetings with tourism groups across the south of Scotland.

Helen McDade: That is great. I simply refer to the fact that that report identified that, when asked whether they would come to an area with wind turbines, people said that they were prepared to pay an average of £6 more a night for a bed-and-breakfast view that did not include a wind turbine. That was one result. Another result was that at the time—the research for the report was done in 2005-06—it was thought that the most sensitive areas had been avoided and that there would be displacement from areas that were heavily impacted. That might not turn out to be true. Perhaps the south of Scotland is demonstrating that that is not the case. Of course, it depends on where people go and what they expect to see when they go there. It is a big question for the Western Isles because people go there for a very special experience and to get back to nature, for example. There are particular concerns about particular areas. We will see.

Richard Dixon: Helen McDade seems to be reading from a different version of the 2008 Moffat report to the one that I have read if she is able to interpret it as saying that wind farms put tourists off. The report's conclusion is:

> "Finally this research set out to establish if meeting targets on renewables would significantly impact on the possibility of meeting tourism targets. Our overall conclusion is that the effects are so small that, provided planning and marketing are carried out effectively, there is no reason why the two are incompatible."

A number of interesting surveys have been done; Helen McDade has mentioned some and I will mention another. A set of interviews was conducted with 380 tourists in areas where there are four wind farms and one in planning. The tourists were caught at tourist information centres and asked a whole series of questions about what they thought about the wind farms. The top-line results were that three quarters of the people that were asked had either a positive or neutral view. Only 25 per cent said that they did not like wind farms, while 39 per cent were positive about them, 68 per cent said that a well-sited wind farm does not ruin the landscape, and 48 per cent said that they like to see wind farms.

The report does not say that there is a major problem, which backs up exactly what Chic Brodie is picking up on the ground. Of course, we all agree that there are places where we should not put wind turbines or other intrusive renewables, but there are plenty of places where we can and it will not damage tourism.

The Convener: I know that Helen McDade wants to come back in on that, but I will let Stan Blackley in first.

Stan Blackley: The committee might be aware that, last week, the minister visited Whitelee wind farm, which is the largest onshore wind farm in Europe, to reopen the visitor centre for this year's summer season. Since opening in September 2009—approximately two and a half years ago—that facility has received 200,000 or more visitors.

I did a wee bit of looking into the VisitScotland numbers for people who visit certain types of attraction. The number of people who visit that wind farm visitor centre each year outstrips the number who visit, for example, Balmoral estate, Bannockburn heritage centre, Glencoe visitor centre, Iona abbey, or even go up the Scott monument. There is clearly a market for people to come and wonder at these machines and the good that they are doing for us.

Helen McDade mentioned some Scottish Natural Heritage statistics that say that wild land is being seriously impacted. Wild land will be seriously impacted anyway. Scottish Natural Heritage's advice is that climate change is the biggest threat to Scotland's natural heritage in the coming years. If we do not do something to tackle climate change, the long-term irreversible impacts on our landscapes will be a great deal bigger than the short-term impacts that we are having on certain sites.

The arguments are that a warmer climate will lead to mountain and alpine species—from the little flowers that grow on the mountain tops to the snow bunting—to be pushed ever further up the hills until they disappear off the top. Machair grassland, coastal heathland and salt marshes are already disappearing at an enormous rate, and a rise in sea level will contribute to that. SNH also argues that the types of trees that we see and the level of the tree line will be impacted by climate change. For example, we are already seeing Corsican pine struggling to survive in Scotland because of climate change causing the right conditions for a pest.

There will also be indirect impacts on habitats and biodiversity. If our climate changes, the birds that feed on a certain species of insect might well start hatching at a different time from when that species appears. Pests might well react differently and the relationship between predator and prey might be mucked up.

In aiming to meet the targets, we do a great deal to secure Scotland's landscapes, habitats and biodiversity. It would be folly not to try to meet the targets; that would cause more damage.

12:00

The Convener: It is only fair to let Helen McDade back in.

Helen McDade: That is very kind, thank you. I will not bandy words with Richard Dixon about what is in the report. I commend it to you and recommend that you look at the dates involved. I note that its key point was that people will shift between areas.

We have moved on a long way—Richard Dixon outlined the history. Targets have moved on exponentially. Stan Blackley has talked about something completely different. He has just talked about climate change targets, and nobody is arguing about achieving climate change targets; we are simply asking whether this is the best way in which to do so.

Aedán Smith: I will make a point about the impact on tourism, from a slightly different perspective. We operate a number of visitor centres across Scotland in our reserves at Vane farm, Lochwinnoch and elsewhere, with which I am sure that some of the members will be familiar. They are popular with our members and with non-members. Our membership is about 1.1 million across the UK and approaches 90,000 across Scotland. When we have polled our members, we have found that they are generally supportive of wind farms—slightly more so than the general population. We are fairly confident that they are not likely to be put off by wind farms. Of course, that is completely dependent on our being able to continue along the track of the fairly good progress that we have made with regard to not putting wind farms in places that are important for birds. We absolutely need to keep that approach going. It is critical that we do not site wind farms where they will be bad for birds and other wildlife. If we do that, the feeling of our members towards wind farms may change.

The Convener: How much money has the RSPB received from the wind power industry over the years?

Aedán Smith: I do not have that figure with me. We have partnership arrangements with a range of developers of wind farms, some of whom are developers of other things across the country, so that is not a question that I can answer.

The Convener: The sums will be substantial, however.

Aedán Smith: It depends on the perspective from which you view the issue. The vast bulk of our funding comes from individual membership subscriptions and from donations from members. I cannot remember the exact percentage, but I have a feeling that individual membership subscriptions account for around 70 or 80 per cent of our total funding. That means that we are quite happy to be critical of individual wind developers even if they happen to be in partnership with us and give us some money. I have a lot of examples of instances

where we have been in partnership with developers—wind farm developers and others—and have taken them through a public inquiry and taken them to court. We have been happy to do that because we are not completely reliant on any finance that we get from them.

The Convener: A member of the RSPB is desperate to make a comment.

John Wilson: I declare my membership of the RSPB.

It is only fair to ask all the panel members the question that has just been asked of the RSPB. They should all be required to produce figures relating to the money and donations that they have received from wind farm operators and corporations that are involved in energy production. It is unfair to select one organisation without asking the same question of other organisations. For instance, where do the bulk of the corporate donations that are received by the John Muir Trust or the WWF come from?

The Convener: I am happy to extend that question across the panel.

Helen McDade: I think it is safe to say that we receive no such funding from any energy companies. I will check and, if I am wrong, I will write to you.

John Wilson: The convener asked about corporate donations.

Helen McDade: I will send you our annual report. Obviously, everybody gets corporate donations.

Stan Blackley: I will have to check but, to the best of my knowledge, over the past three years, we have received roughly £11,000 from ScottishPower Renewables. That is it, in terms of renewable energy developers. In terms of other corporate interests, I believe that we received a small five-figure sum from a company that makes music software. I think that that is probably it. We tend to shy away completely from taking money from business.

Richard Dixon: We have received no money in the past 10 years—which is as far back as my memories of WWF go—from renewable energy developers. In terms of energy companies, we have received small amounts of money from Scottish Power for two studies, one on electric vehicles and one on heat, which is the as yet unpublished one that I mentioned earlier. Those contributions were of the order of £10,000 to £15,000.

We get some money from Scottish and Southern Energy when shareholders transfer their communications to electronic means, and that relationship has been on-going for several years; it is in the order of a maximum of about £20,000 this year, I would think, and is unrelated to any energy work. We work with a number of other corporates, such as Marks and Spencer on aquaculture, but there is nothing in the energy field. That is all in our annual review, which went on our website just yesterday.

John Park: With one eye on our future sessions, I will ask a couple of questions about planning issues. As you can imagine, MSPs get a considerable amount of correspondence, particularly from people who live in the vicinity of small-scale, on-land wind farm proposals. [*Interruption.*] Is that squeal coming from my hearing aid? No; that got me a bit paranoid for a moment.

In terms of where this inquiry is going, how will some of the campaigns that are starting in the public mind impact on meeting the renewables targets? As regards keeping the public onside, do you have any concerns about some things that might be developing and the information that is out there? What do you see as the challenges for the Government and MSPs in ensuring that the wider public understand the priorities, challenges and targets?

Helen McDade: It is very useful to look at planning. There are two sides to it. We want to ensure that the right thing in the right place can go ahead with the least aggro to everyone, especially the people who live locally. There is nothing worse than falsely leading people into a process of years of attrition if, at the end of the day, the project will go ahead. That is one reason why we have been calling for years for a national energy plan. If it were felt nationally that something was needed, it would be far better if we considered it across the board and had a strategic plan. We should have carried out a strategic environmental assessment of much of the transmission and many of the large developments so that we knew where to put them. Then, yes, by all means, the planning process should be made as smooth as possible.

I do not agree with what Niall Scott said earlier about the need to speed up the planning process. A Sainsbury's is going to be built where I live and, although we are a couple of years into the process, there is no sign of work starting yet—that is standard. I do not think it is unreasonable that, for a huge energy development, it should take several years to look at the environmental impacts on birds and so on. That is why we have a planning process. We hear, "We must speed up the planning process," but I do not think that it is true that it is mainly planning that holds such things up. For example, Griffin wind farm in Highland Perthshire was given consent in January 2008, the day after a meeting that Murdo was at. John Swinney was there and said that no decision

had been taken, but the next day it was announced that Griffin had been given the go-ahead. That is why I remember the date—January 2008. No building started until last year, and what held it up was finance. The work started because the European investment bank gave SSE a soft loan—and because of several others that SSE has. A lot of it is about money, not planning, but it is convenient for developers to say that it is planning. In the same way, Ofgem says that it has speeded the process up at the same time as saying that it is consulting. Which is it? If the decision to go ahead with such things is made nationally, it is really not fair to local people to drag them through a process.

A lot of people have been very upset by a lot of what is going on. We often hear from my colleagues on the panel that 20,000 people objected to the Hunterston power station proposal. Some 20,000 people objected to the Beauly to Denny transmission line proposal, too. That does not mean that such things should not happen, but it does mean that a lot of people were quite excited by them and that we should consider them properly. The national planning framework needs to consider what has happened there very closely and to ensure the proper strategic environmental assessment of national developments. People will then have some confidence in the planning system, which I think that they do not have at the moment—I meet a lot of people from all walks of life who have had a terrible experience of it. I wonder what it does to our democracy when people go through four or five planning application inquiries in their small local area and all the proposals go ahead. It would be better if people never had to go through that.

Aedán Smith: We need more of a national steer, particularly on onshore wind, as we get towards reaching the targets, because the landscape in the broadest sense will get busier and we will want to ensure that there is not too much of a cumulative effect on particular areas or particularly sensitive parts of the environment. Only central Government can have a national overview of which areas of the country should, broadly speaking, take more of that sort of development and which should take less. That will become increasingly important in the next few years. It is important that there is still a lot of local say in that process, but central Government will have to have that national overview of how we meet the national targets. That will need a bit of work in the next wee while.

At present, the process in the planning system is pretty good. We have recently gone through planning modernisation, which in some ways is still bedding down a little but, in our experience—we are involved in many planning cases every year—the problem is not so often the system as much as resourcing of the system. Local authority planning departments are often hard pushed for resources and lack specific expertise just because of the scale of the issues. For instance, a local authority planning department might not have any access to specific ecological advice, so it will be completely reliant on SNH, which, as with all sectors of Government at present, is also under pressure. As we move towards achieving the targets, it will be important that resources are in place to ensure that decision makers at local and national level have access to the specialist advice that is required so that we get developments in the right places and without causing any damage.

Helen McDade referred to the speed of the application process. Faster decision making is not a problem for me, as long as the right decisions are made. I am happy for the rubbish proposals to be refused quickly and for the good ones to be approved quickly. However, sufficient resources must be in place to enable adequate scrutiny of the applications. Applications that are not quite up to scratch still often come in from developers, which is how some of the delay arises. When a proposal is submitted, we often have to go back to the developer for more information because there is not enough to allow us to predict what might happen. That can slow down the process significantly.

We have statistics on how quickly applications are processed. A big part of the delay for an individual application might be because, when it was initially submitted, it had inadequate information, yet the blame falls on the planning system rather than on the developer, who has not put enough effort into the application in the first place. We need to get enough information in the first place so that we have good-quality applications, which will help to speed up the process. Ensuring that the system is resourced adequately will also help to speed up the process.

Richard Dixon: I will touch on Chic Brodie's question about blockages that campaigners are potentially putting in the way of development and the information and misinformation that is out there. On the call for a national energy plan or energy commission, my memory of the last five or six years is that we have had at least two energy white papers at UK level. We have had an Energy Bill and there is another one to come. We have electricity market reform, which is all about how the energy market will run and which technologies we will have. In Scotland, there is the slightly embarrassing fact that we do not control energy policy, but we act as though we do. However, the Scottish Government has produced several documents on renewables. I have here a pretty comprehensive one that is only about seven months old, the "2020 Routemap for Renewable Energy in Scotland", which sets out in detail where

we are trying to go. So there is a lot of information on where we are, where we are going and what the benefits are.

Another point that has gone unchallenged is on the cost of wind farms, which Helen McDade has mentioned twice. A recent report from Bloomberg New Energy Finance said that the generation cost of a wind farm in a windy site is now on a par with the cost of fossil fuel and nuclear generation and that, by 2016, that will be true even for a wind farm on an average site, although Scotland has more than its fair share of above-average sites. We are at the stage at which onshore wind is as cheap as building a gas-fired power station. It is certainly much cheaper than the fantasy economics of a nuclear power station. There is a myth out there that these things are terribly expensive, when in fact they are coming down to the same price as everything else.

12:15

I will finish off on one of our favourite topics. Mr Trump is entitled to his opinion, as everyone is, but it is rather rude to write that opinion in a letter to the First Minister, give it to the press and call the First Minister mad. The convener and I disagree on nuclear power, but I do not feel the need to call him mad Murdo, write him a letter and give it the papers.

The Convener: Nor do I call you mad Richard.

Richard Dixon: Indeed. We can have a polite conversation about this without going to the papers. Mr Trump does not seem capable of that, which is dangerous. He says that he wants to spend £10 million protecting the coastline. He has been through an interesting Damascene conversion, because although he has just trashed a bit of the coastline, he is now going to spend whatever it takes to protect the coastline of Scotland—from us, apparently. That is very generous of him, but a little inconsistent.

He will make it seem as though there is a big disagreement about offshore wind developments. There is not. We have spent almost all of this evidence session talking about onshore wind, where there are disagreements. Although there is some controversy about offshore—there are some good proposals and some not so good proposals, and there are things to be sorted out—it is not huge. However, Mr Trump will help to manufacture controversy. If he ever spends that money, he will give it to Communities Against Turbines (Scotland), which the committee may see in front of it at some point. The group's website, when it works, which is rare—I do not know whether that is because so many people are looking at it or because not much has been paid to run it—has a section called "Alternatives to Wind", which has one thing in it. The group's alternative to wind power is Chinese thorium nuclear reactors. Energy efficiency is not mentioned.

With £10 million, it will no doubt flesh that out with some more intelligent stuff, but it is a shame that £10 million, which after all is a large amount of money to put into any public relations exercise in Scotland, will make it much harder to get the right renewables in the right places to get the jobs benefits, the export benefits and to continue to be a world leader in wave power, and to meet our renewables, energy efficiency and climate change targets.

The Convener: We will take evidence from Communities Against Turbines (Scotland), so we can ask it about that.

I want to pick Richard Dixon up on his point about the costs in the Mott MacDonald analysis of onshore wind power. If onshore wind is now so cheap, why do we need to subsidise it?

Richard Dixon: I agree that if we are convinced that it does not need subsidies, we should not be giving it subsidies. It is the job of Niall Stuart, who sat here earlier, to say that his industry continues to need subsidies. He and I agree on quite a few things, but not necessarily on this one. A Bloomberg new energy finance report, which is a pretty reputable source, says that at the windiest sites we do not need subsidies. If that is the case, that is fine. We should continue to consider good applications in good sites, but we should not give them subsidies if they do not need them. I am all for saying, "Here's a technology that is now so mature that in the right circumstances, no public money, thank you very much."

The Convener: Helen McDade is desperate to come back in, then John Park has another question.

Helen McDade: Since I seem to be somehow included in what Richard Dixon said, I would just say that my point was very much the convener's, which is that the cost to the consumer is not dropping dramatically, having gone from 1 ROC to 0.9 ROC. The issue is not what profit the companies are getting, but what it is costing us.

There is a comparison here with the old days in the European common market, when there were butter mountains and grain mountains and so on. It starts with a perfectly reasonable desire to get a good thing—a secure energy supply—and it is subsidised in a way that leads to an unhelpful result. Why are we not getting to reduce the subsidies? When ROCs were introduced, we were told that they were an interim measure to get to a mature technology. We now have a mature technology, and I agree that it is time to stop subsidising it.

John Park: Part of my initial question was about smaller-scale onshore wind turbines. Sometimes it seems to be down to whether someone has a bit of redundant land that they want to use and from which they want to realise something. That is where a lot of the tension is starting to develop. We need to keep an eye on that. From the answers that you have given me, I do not know whether it will have a direct impact.

This week, Scottish Natural Heritage produced a document that gives guidance for developers and people who are interested in policy development. Have any of the witnesses seen that document? If so, what are your views on it? Did any of you have direct input into it?

Aedán Smith: We have certainly seen it; we worked very closely with SNH on its suite of guidance notes.

Your initial question was about whether more could be done to ensure that smaller-scale development could happen in the right way. We get involved in quite a lot of individual, small-scale developments because, although it is less likely to be the case, small-scale developments can also be bad for wildlife if they are in the wrong places. In our experience, there is a difference in the quality of supporting information that comes forward for small-scale developments. Perhaps that is not surprising given the finances that are available and the overall budget for small-scale projects. Again, central Government could help out a little bit in that area.

It is not a big deal for Scottish Power, SSE or one of those guys to get some fancy consultants to do a fancy environmental assessment and present it to us; even then, they sometimes come forward with some pretty rubbish assessments. It is not surprising that doing the sort of assessment that is often required is a challenge for the smaller guys, because the small developments are sometimes in the best bits of Scotland's environment. That does not mean that a development will not be okay, but we need to be careful about it to ensure that we do not have problems such as something sitting on top of a golden eagle's nest. Nobody wants that to happen. I believe that the Scottish Government could do a bit more to ensure that there is sufficient quality of information to ensure that developments are genuinely sustainable.

The Convener: Chic Brodie has a brief supplementary.

Chic Brodie: I was going to ask a question about the SNH guidelines. I have had meetings with councillors across the south of Scotland to get them to get together so that they can ensure that they follow the planning guidelines and that a consistent approach is taken, particularly on cumulative impact. Wind turbines or certain wind farms are no respecters of county boundaries, so I think that we should do what I described across the country.

Mike MacKenzie: I have lived in north Argyll for most of my life. It may be news to some of the panel, but the indigenous woodland that used to cover most of Argyll was cut down in the early 1800s to provide charcoal to make cannonballs for Nelson's navy, so it is not a pristine environment by any means. I travel extensively across the Highlands and Islands region and have a bit of an interest in its history back to the Neolithic period, and I cannot find the wild environment almost anywhere that genuinely has ecosystems that have been untouched and unaffected by the hands of man. Can you tell me where it is and assist me in my efforts to get back to nature?

The Convener: I think that that is for you, Helen.

Helen McDade: Yes, I expect it is.

I do not have the map with me, but I can certainly show you the top 10 per cent of wildest land according to a range of criteria. Your argument is interesting, but nobody is saying that Scotland has large-scale wilderness in the way that, say, some of eastern Europe has. However, I do not think that many people would accept that that it is therefore a reason to say that, because it has been impacted a bit by man over thousands of years, it does not matter if we do not protect what we have got.

We can tell that many people, particularly many Scots, value our wildest and most natural landscapes. I am afraid that I use a very anecdotal piece of evidence in that regard: the calendar test. I look at the calendars that are sold at Christmas and how many Scots love to have those with pictures of the wildest areas. You can look at the photos and you will know where the places are. It may well be that there were some crofts there at some point, or that some tracks have been there—of course there is cultural history there, as well.

My organisation and I believe that a connection with the natural environment is critical for people's wellbeing. There is increasing evidence about how people's connection with nature makes them feel. Some of it is about biodiversity—for example, having different species of birds—but some of it is about standing in the landscape. People know it when they see it. I am sure that you do, too.

Mike MacKenzie: Yes. I am very lucky, because I get in my sea kayak and after an hour or so of paddling I can see the golden eagles in the Garvellachs and I can go over to the south-west coastline of Mull and see sea eagles any time of the week. I see a lot more porpoises and dolphins than I used to.

About six months or so ago, our harbour had become silted up so I got my favourite toy, which is a big 20-tonne excavator, and dredged the entrance to the harbour.

The Convener: I hope that you had a SEPA licence.

Mike MacKenzie: SEPA and I are very good friends.

I was working early in the morning, at dawn, to take advantage of spring tides. An otter was playing just beyond the reach of the excavator. As I went out, he would swim away a bit and come back again. Are you not afraid that we sometimes underestimate the resilience of nature and the ability of wildlife to get on very well with the activities of mankind?

Helen McDade: Some species can do so and others cannot. Aedán Smith is the one to respond to that question.

Aedán Smith: Our understanding of how nature and wildlife respond to development is still evolving, but it is improving all the time. For example, our understanding of how Scottish wildlife reacts to wind farms is improving massively now that lots of wind farms are out there and we can see what happens.

Obviously, you know Mull quite well. There are a lot of white-tailed eagles there, and there are lots of golden eagles in Argyll. Those are two of the species that are potentially quite vulnerable to wind farms and, as a result, we rightly needed to be cautious about our approach to the siting of wind farms.

We are working closely with our Norwegian international birdlife partner on a wind farm in Norway, which is a disaster for white-tailed eagles; it has killed almost 40 of them in the past few years, because it has been put on a site that is particularly important for them. Despite protestations at the time, the Norwegian Government went ahead with the development. That is a real bad-news story and it is a reminder to us that we need to be very careful about what we do in Scotland. We must ensure that we can show that we can develop the industry sustainably without damaging wildlife. We can then export that approach internationally and say, "Listen, we have done this, but we have done it without harming our wildlife."

Mike MacKenzie: Do you not agree that we seem to be getting it about right with regard to sea eagles and golden eagles?

Aedán Smith: You are right that our fairly precautionary approach seems to have worked so far. It means that we have to be firm with proposals that are in the wrong places and that we have to refuse the very worst ones. We have been strongly opposed to a proposed development at Stacain, near Loch Awe. That is an important area for golden eagles, so if the development had gone ahead, it would have been really bad news for golden eagles in Argyll. We must be firm on such proposals and encourage the ones that will not be a problem for birds and wildlife.

Patrick Harvie: I will pick up on some of the issues around planning, which Helen McDade and Aedán Smith talked about.

Before I do that, I will express a bit of concern about some of the issues about money that were raised a few minutes ago. In my experience, non-governmental organisations, whether they adopt positions with which I agree or disagree, tend to be among the most transparent organisations about where they get their funding from; they are far more transparent than American billionaires or right-wing think tanks. I would be concerned if we put tougher questions to this panel of witnesses on that issue than we do to some of the future witnesses whom we expect to call.

About seven years ago, I sat around tables like this one in rooms like this one scrutinising the Planning etc (Scotland) Bill. There was widespread recognition—it was not specific to any particular industry—that the planning system was not working in the interests of communities or developers, or in the wider public interest. Many Opposition members tried to amend the bill to introduce a third-party right of appeal or other mechanisms that would redress the balance a little and introduce a slightly more democratic element and better scrutiny of the national planning framework.

We managed to get a sustainable development duty, but not better democratic scrutiny. Many of us argued that such an approach could be adopted without it becoming either a developers' charter on the one hand or an objectors' charter to object to all forms of development on the other. If the committee is to draw any conclusions about how the planning system could change, what should we be looking for?

12:30

If we want developers who do not feel pushed into having to make speculative applications if they are going to get any through, we need to give them confidence that the applications they submit will be accepted. If objectors or communities are to engage constructively, they must be able to know that they will be heard and taken seriously; however, they also have an obligation to compromise, to listen if a developer changes, say, the number or the position of turbines and to withdraw any objections based on such issues.

I put those points not only to Aedán Smith—after all, RSPB has a record of being willing to compromise and consider the options when a development proposal changes—but to Helen McDade. There are certain things that we would all want to ensure a more democratic planning system but, in seeking such changes, we come up against some hard questions of their practical consequences. We do not want developers to behave irresponsibly by, say, getting on the phone to the chief planner as soon as a local council tells them no, but we want them to develop in the right places.

Aedán Smith: There is always scope for improvement. It has to be said that the current planning system is not doing too bad a job. For a long time, one of the Scottish Government's objectives has been to increase deployment of renewables; onshore wind generation, for example, has increased from almost nothing 10 years ago to a pretty substantial level—I believe that 3GW have been installed and there is plenty more in the system. That suggests that, with regard to meeting that national aspiration, the system is working quite well.

However, there is a question whether people are feeling properly engaged with the system. As the representative of a non-governmental organisation that is relatively large and relatively well resourced—although not, I have to say, as well resourced as other organisations—I would say that we have been able to engage with the planning system fairly effectively, but that might be different from the experience that communities have had.

That said, we have had particular difficulty with the energy development at Hunterston, which, as part of the national planning framework, has been established as a national development with a national need. Despite the fact that pretty much no one wants it—indeed, there has been cross-party opposition to it in the Parliament, the local council has voted against it twice and there has been a massive number of individual objections to it—the fact that the need for it has been established in a national planning framework means that it will be tricky to reject, even if ministers ultimately decide to do so. The issue needs to be revisited. Indeed, a review of the national planning framework, which will happen soon in any case, might provide a means of establishing our national priorities in a clearer and slightly more spatial way and allow us to think about what we want to happen in different parts of the country. In fact, such an approach might give developers and communities a bit more certainty about what is likely to happen.

Helen McDade: Given the possible implication that we object all the time, I must point out that, over the past five years, the John Muir Trust has made individual objections to about 15 proposals. We are simply trying to achieve strategic change.

Nevertheless, serious concerns remain. I absolutely agree with Patrick Harvie that, when the planning changes were made, we were among those who were trying to get certain balances introduced into the system. We certainly feel that third-party right of appeal was a missed opportunity; I do not understand why, after people have been through public inquiries and all the rest of it, it is deemed all right for a developer to come back again and again with a slightly changed application but the other side has no opportunity to challenge it. I realise that the issue will not be revisited any time soon, but it represents a real lack in the system.

There is no doubt that people feel that lack. Because of the various local campaigns, a planning democracy organisation has been set up—there have been a number of others—to look at this issue at a national level. We need to look at the way in which the national planning framework justifies the need for a development, regardless of what has changed.

Taking Hunterston as an example—I should say that I do not agree with RSPB's assessment and I think that we need back-up—I am not sure that it makes a lot of sense to say, five or 10 years down the line, that there is a proven need for that technology. In that time, technology has changed completely and nobody is using coal any more—they are all using something else—but the development is in the national planning framework. We must think about the fact that the need is in there. Some of the strategic environmental assessments were not taken on board when all the boxes were ticked at the end and it was said that the need for the development was proven.

Patrick Harvie: One of the things that marks out Hunterston as different is that, although the national planning framework was approved after a process of parliamentary scrutiny, Parliament has also voted specifically and repeatedly against that particular development. The question of its need having been established democratically at a national level is in doubt, which is not the case in relation to other areas, such as renewables, in which most of us agree on the need for capacity to be increased.

The Convener: You have made your point, Patrick. Given the time, we will move on.

Jim Eadie is keen to ask a question—I hope that it is a brief one.

Jim Eadie: I want to return to the renewables target. The written evidence from the John Muir Trust states:

"If the 2020 renewables target is delivered primarily using wind, the evidence that this will significantly help to deliver the"

greenhouse gas

"emissions reduction target is very weak."

What is the evidence base for that statement, please?

Helen McDade: I suppose that the evidence base is the First Minister's statement that we will have nearly as much conventional back-up. It is quite simple.

Jim Eadie: Much as I admire what the First Minister has to contribute to the debate, I am interested in the evidence base. Can you cite any sources in evidence to support that statement?

Helen McDade: The table that I have included in my written submission came from a Citigroup report. Although people were quite excited about it, it was based on the same assessment on which I have just quoted the First Minister, that we will get just under half our electricity from other, conventional sources and that, in 2020, the amount of coal and gas generation capacity will not have reduced very much. On that basis, and given all the carbon emissions that are associated with building all the renewables facilities—the steel, the concrete and the roads—it is a sum.

Jim Eadie: I just wanted that on the record. I will ask the other panellists for their views in a moment. Is that statement consistent with the statement in your written evidence that you believe that the renewable energy target can be achieved?

Helen McDade: They are talking about two different things: one is about the greenhouse gas emissions reduction target and one is about the renewables target. There is no doubt that, if we establish enough renewables, we will meet the renewables target. The point is that, although the target is 100 per cent of Scottish consumption, we will be producing nearly twice as much electricity as that. That is the basis for the statement that it is hard to see how wind generation will contribute well to meeting the greenhouse gas emissions reduction target.

Jim Eadie: The renewables target can be met, but it will not have an impact on the reduction of greenhouse gas emissions.

Helen McDade: Absolutely.

Jim Eadie: Okay. I now understand your position and the evidence base. Can I have the views of the other panellists, please?

The Convener: Briefly.

Richard Dixon: The Citigroup report is fairly easy to criticise. For example, the table suggests that, in 2020, there will be 1.5GW of gas generation capacity, which ignores the fact that a new gas-fired power station of another 1GW has been consented to at Cockenzie. It also suggests that there will be 2.4GW of nuclear generation capacity, which would be surprising given the fact that Hunterston will shut in 2016 or 2017. The numbers in the table are questionable.

Earlier, I cited figures on how much CO_2 we are saving as a result of renewables; currently the figure is 5.6 million tonnes and in the future, if we meet the target, we might save 13 million tonnes. Helen McDade is quite right—we may still have coal, gas and nuclear power stations running and producing electricity, and if we are selling that electricity to England we will be competing with other sources, most of which will similarly use coal, gas and nuclear power. In the case of coal and gas, that will still produce some CO_2 emissions; therefore, although we might feel squeaky clean in Scotland, we will still be contributing to carbon emissions. However, that is a question for a longer timescale as we phase out those power stations. Our report suggests that we could be generating 130 per cent of our energy from renewables by 2020 and 185 per cent by 2030. So, by 2030, on an average day, we could be meeting all our energy needs and exporting another 85 per cent in renewable electricity—helping England to meet its targets and reduce its CO_2 emissions.

The Convener: Unless the other two gentlemen are desperate to add to that, I will ask a final question, which follows on quite neatly from that line of discussion.

This morning's discussion has largely been about the generation of electricity. As we have heard, that issue is related to but distinct from the issue of reducing greenhouse gases. If we took all the money that we are putting into subsidising renewable energy and put it into measures to reduce energy demand, such as home insulation, would that give us a bigger bang for our buck and create more jobs?

Helen McDade: Yes and yes.

Richard Dixon: That is an excellent question, to which I do not know the answer. The obvious answer, of course, is that we need to do both.

The Convener: I understand that, but if it were a question of substituting money in one pot by another pot, what would the answer be?

Richard Dixon: I do not know. I do not think that anyone has the answer to that question.

Stan Blackley: It really depends on the pots. If we had to substitute money, I would say that we did not need to build the second Forth road bridge and that the £1 billion-plus that are being spent on

it could easily insulate every home in Scotland free of charge and help us to meet the targets very easily. Therefore, it depends on which pot we are talking about.

The Convener: That is not a very helpful answer. I am saying that, if we switched the money that we are putting into subsidising renewable energy, would that be a better way of spending it if the ambition is to reduce greenhouse gas emissions? I think you are saying that you do not know.

Stan Blackley: I do not.

Aedán Smith: I do not have much to add to that. It is always important to remember that there are other sectors—that there are heat and transport, for instance. If we are going to go for the major electrification of transport, we need to get the electricity generated to do that. Therefore, there are many other complicating factors to consider.

Helen McDade: In 2007, I think, Ofgem said that renewables obligation certificates are a very expensive way to buy carbon reduction. I do not disagree with it on that.

The Convener: Right. That is great. I thank members of the panel very much for their time. You have been very helpful and have answered our questions extremely well.

Meeting closed at 12:42.

Members who would like a printed copy of the *Official Report* to be forwarded to them should give notice to SPICe.

Available in e-format only. Printed Scottish Parliament documentation is published in Edinburgh by APS Group Scotland.

All documents are available on
the Scottish Parliament website at:

www.scottish.parliament.uk

For details of documents available to
order in hard copy format, please contact:
APS Scottish Parliament Publications on 0131 629 9941.

For information on the Scottish Parliament contact
Public Information on:

Telephone: 0131 348 5000
Textphone: 0800 092 7100
Email: sp.info@scottish.parliament.uk

e-format first available
ISBN 978-1-4061-8523-2

Revised e-format available
ISBN 978-1-4061-8536-2

Printed in Scotland by APS Group Scotland