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Official Report

ECONOMY, ENERGY AND TOURISM COMMITTEE

Wednesday 30 May 2012

Session 4

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ECONOMY, ENERGY AND TOURISM COMMITTEE
18th 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:

Peter Atherton (Citigroup Global Markets)
Andrew Buglass (Royal Bank of Scotland)
Duncan Carter (Consumer Focus)
Dr John Constable (Renewable Energy Foundation)
Guy Doyle (Mott MacDonald Ltd)
Andrew Faulk (Consumer Focus Scotland)
Paul Lewis (Scottish Enterprise)
Dr Maitland Mackie (Mackie's)
Sir Donald Miller

CLERK TO THE COMMITTEE

Tracey White

LOCATION

Committee Room 6

Scottish Parliament

Economy, Energy and Tourism Committee

Wednesday 30 May 2012

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

Renewable Energy Targets Inquiry

The Convener (Murdo Fraser): Good morning, ladies and gentlemen, and welcome to the 18th meeting in 2012 of the Economy, Energy and Tourism Committee. I welcome our witnesses and visitors in the public gallery and remind everyone to turn off their mobile phones and any other electronic device that might interfere with the sound equipment. We have received apologies from John Park MSP.

The only item on our agenda is the continuation of our inquiry into the Scottish Government's renewable energy targets. I welcome to the meeting our first panel of witnesses: Paul Lewis, managing director of sectors and commercialisation at Scottish Enterprise; Dr Maitland Mackie, chairman of Mackies; and Andrew Buglass, managing director and head of energy, structured finance, corporate and institutional banking, Royal Bank of Scotland. I also welcome back Peter Atherton, head of European utility sector research at Citigroup Global Markets.

Before we get into questions, I invite the panel to make some introductory remarks.

Dr Maitland Mackie (Mackie's): As an enthusiast of and, indeed, guru in wind power in particular and renewable energy in general, I am terribly pleased to be invited to this evidence session. There has been far too much negativity about wind power, and I am delighted to have this chance to make some fundamentally positive points to the committee.

Do you want me to make some general points right now, convener? I will need about five or 10 minutes.

The Convener: We have your written submission, Dr Mackie, and rather than get a long explanation—

Dr Mackie: I will not be long.

The Convener: Five or 10 minutes sounds long to me. Members will ask a wide range of questions, and it might be better if you simply responded to them.

Dr Mackie: I want to make one sharp point. I note that today, for the first time, the press and those who are only just beginning to know about energy have actually admitted that the cost of energy can only go up. Last year, it went up 15 per cent and, in today's *Scotsman*, it has been suggested that it will go up 15 per cent again this year. We need to realise that that will happen until we have enough renewables at a substantive enough level to fill the increasing gap. As I say in my submission, one of the solutions is onshore wind power on a large scale—and by "large scale" I am talking about the size of the turbines. You are wasting people's money supporting all these tiny little toys. The arguments for all that are in the booklet that I have submitted to the committee.

Given that you have not managed to stop me yet, convener—

The Convener: Don't tempt me.

Dr Mackie: This is me telling you what you have to do. You have to take the Forestry Commission to task and get it to change its attitude, because it is giving away an enormous amount of Scotland's renewable energy potential. The committee has received all my submissions and on page 18 of the booklet that includes various supporting comments you will find Alex Salmond's latest letter to me—which, by coincidence, came in yesterday or the day before—in which he regurgitates the Forestry Commission's defence of its actions. I know about the potential of wind power and can ride a horse and cart through the commission's arguments. Convener, I hope that you and your colleagues will take a good look at that evidence, take the Forestry Commission to task and get Audit Scotland not just to pass over the matter but to examine the commission's deals with four international companies. It has given away to foreign shareholders a potential £300 million to £400 million in annual income that should have been Scotland's. I could take up the rest of your meeting, but I will stop there.

Andrew Buglass (Royal Bank of Scotland): Thank you very much for inviting RBS to give evidence. The team that I run is responsible for providing finance to the energy sector across the UK and, as you probably know, for the past couple of years we have been engaging with the UK and Scottish Governments on the issue of renewable energy in particular. In fact, as independent research that we provided to the committee back in March shows, RBS last year provided more funding to the UK renewables sector than any other bank. We have more than 20 years' experience of lending to the renewables sectors and are delighted to help the committee in any way we can.

The Convener: Thank you very much. I should mention that a representative from Triodos Bank

was supposed to give evidence but, unfortunately, they had to pull out at short notice and we were unable to secure a replacement. I am afraid that you will have to carry the flag for the general financial sector, Mr Buglass.

Andrew Buglass: I am happy to do so, convener.

Paul Lewis (Scottish Enterprise): I welcome this opportunity to give evidence to the committee. As the committee will know, the focus on renewables and the transition to a low-carbon economy are two of the five priorities in Scottish Enterprise's business plan. There are two reasons for that: first, the scale of the opportunity for Scotland, particularly in the renewables sector and, secondly, the very strong competitive position that Scotland has established in this new industry. We are already seeing some encouraging signs of private sector investment in the industry and there are huge opportunities for research and development, manufacturing and ultimately services that can be supplied to the industry both in Scotland and globally. As a result, we very much welcome this opportunity to speak to the committee.

Peter Atherton (Citigroup Global Markets): As an equity analyst, I must make it clear that any views that I express are my own rather than Citigroup's.

The Convener: Before we move to questions, I point out that our panel is rather disparate with regard to their different perspectives on the matter and ask members, if they can, to direct their questions to specific panel members. Of course, if witnesses want to answer a question that has not been directed to them, they should try to catch my eye and I will bring them in. If we have all of you answering every single question, we will be here for an awful long time and will never get through all our questions.

Rhoda Grant will begin with the whole issue of finance, investment and costs.

Rhoda Grant (Highlands and Islands) (Lab): Are there sufficient amounts of investment available for renewables projects to meet the 2020 target for 100 per cent of electricity demand to be met by renewables?

Andrew Buglass: I am happy to provide some perspective on that.

Overall, I think that finance is available for strong projects. As I said, in recent years we have been a very strong lender to the sector; I should also stress that our funding covers projects of various sizes across the full range of proven technologies. Not only have we funded large projects but, in the past 12 months, we have introduced a scheme targeted specifically at smaller projects involving only one, two and three turbines. That said, although funding is available for the projects that are coming through, other challenges such as permitting, access to grid and radar issues also need to be dealt with.

As to whether banks are willing to provide funding, we are certainly eager to continue to provide strong support to the sector. We have been lending to the sector for more than 20 years. We did our first onshore wind farm financing back in 1991—I think that that was the first project-financed wind farm in the UK—and since then we have been lending consistently.

We absolutely are funding proven technologies—onshore wind and, more recently, solar and biomass. In the past 12 or 15 months we have had some fairly notable firsts to try to bring forward the availability of funding in areas that have not typically had funding from banks in the past. For instance, in Scotland we were the first to lend to the Helius Energy project, which is the Rothes distillery biomass project. That was last year—in April, I think—and it was a £40 million project that we financed. The Helius project was the first of several biomass projects that we have funded in the UK; it is important to note that it was a Scottish project.

Last year we provided more lending to the sector than anyone else did. Indeed, we provided twice as much as our nearest rival on the independent list provided. We provided 27 per cent of the total UK renewables funding and more than 40 per cent in Scotland last year. That is a significant track record, which demonstrates that money is available for good projects.

Paul Lewis: As Andrew Buglass said, the finance is there for proven technologies. There is also clearly an opportunity to provide finance for some of the emerging technologies. Scottish Enterprise is certainly encountering increasing demand for the kind of support that we can provide in relation to investment in some of the earlier-stage technologies, particularly marine and some of the remaining prototype developments in offshore wind. For example, renewables projects are taking an increasingly significant share of the investments that we make through the Scottish Investment Bank in early-stage risk capital. We are seeing more demand for our R and D support, to allow companies to prove prototypes—

Rhoda Grant: May I interrupt you? I understand that there is a lot of investment out there, but is it sufficient to enable us to reach the 2020 target?

Paul Lewis: As Andrew Buglass said, the investment is currently there for proven technologies, and given the efforts to reduce costs in some of the emerging technologies, such as offshore wind, we should have confidence that the

market will adjust and provide the finance that is necessary.

Rhoda Grant: To reach the 100 per cent target?

Paul Lewis: Yes, indeed.

Dr Mackie: It is a hugely important question. I agree that there is plenty of finance for the huge-scale projects—the ones with 50 or 100 turbines that we see here and there—because the big companies can organise that for themselves. However, the trick that we are all missing is to get investment for the smaller people. Regardless of what Andrew Buglass said, people are having serious difficulty getting £5 million, £10 million or £2 million for small-scale projects.

I hope that everyone understands that the rural sector is full of people who want to have a go on a small scale—as in Mackie's experience. The investment was the best one that my company has ever made—I had nothing to do with it; my kids, who are all in their 40s, are running the show. Our 2.5MW of wind power has revolutionised our local business and made it hugely sustainable in the current situation.

That could happen a thousand times here and there across Scotland, if the smaller guys could get at the finance. We are talking about 1,000 3MW installations, which would require £3 billion, but 1,000 3MW beasts would add about 50 per cent to the electricity supply in Scotland. All we need is the guts to make policy, to spread funding around so that we can focus the money of the rural sector—in all its shapes and sizes, from the individual entrepreneur to the site owner and the local community—into that space.

They do not like putting their money into that space as there is a high element of risk because, if you do not get planning permission, you lose everything that you have put together up to that point. Once you have planning permission for a site that has an average wind speed of over 7 metres per second, as long as you build the big jobbies—it is a waste of time for the small turbines—it will make the rural sector a heap of money. Here is a real challenge. If we had 10,000 3MW installations across Scotland—which is not a lot—that would bring into the rural sector £4 billion of annual net profit, which would be spread across the ownership, instead of going to the big guys. If you find a way to get lending to those small institutions, you can spread the money. Only two things are needed: an average wind speed of 7 metres per second or more; and decent windmills, not little toys.

I could go on forever on this, as you know, Murdo, but I will stop there.

10:15

The Convener: That is good, thank you. I think that it is only fair to let Mr Buglass respond to that.

Andrew Buglass: I absolutely agree with Dr Mackie. The issue that he outlines has, historically, been a big challenge, and many banks struggle with the smaller projects. I was interested to see in the *Official Report* of one of your meetings earlier this month mention being made of the fact that Triodos and the Co-operative Bank are reducing or withdrawing from their lending to the smaller sector. I quote:

> "Triodos Bank changed its policy and will no longer consider funding smaller generators ... it is hesitant to do so under the feed-in tariff ... The Co-operative Bank ... has similarly indicated that it will no longer consider smaller schemes."—[*Official Report*, *Economy, Energy and Tourism Committee*, 9 May 2012; c 1452.]

We recognise that that has been a big issue. As a result of that, as I said earlier, we have set up a scheme that, admittedly, is of small scale at the moment but involves a £50 million fund that is specifically targeted at the small generators. We have, additionally, trained 200 people across our business in the UK to provide those loans to the agriculture sector. The training that they have undertaken has been accredited separately by the Chartered Institute of Bankers. Of that £50 million, £16 million has been loaned already, since we launched the scheme. That includes 44 turbines across the country, of which 16 are in Scotland. There is a move on our part to recognise that there is a significant challenge. We believe that it is important for the bank to fund qualifying projects that have strong economic cases, and to provide a lower-cost way for those projects to secure the funding that they need.

Peter Atherton: The Scottish target is a subset of the UK target, which is a subset of the European target, so I will start at the European level and work my way down.

The European Commission estimates that meeting the 2020 target will cost roughly €1 trillion to €1.2 trillion across the 27 members of the European Union. That would require an investment of around £100 billion a year from now on. We calculate that, at the moment, the investment is about £50 billion, which is down from about £60 billion a couple of years ago. Companies across the utility sector are slashing their capital expenditure, rather than increasing it. There is, therefore, an enormous investment shortfall between what is required at the EU level and what is being invested.

Even if the companies had the desire to fill that gap and up their investment towards £100 billion a year, they would not be able to get that equity—the equity markets are, essentially, closed for companies that are looking to massively expand

their capital expenditure in the utilities and renewables sectors. There is not that much debt financing around, either. Typically, in Europe, most of the debt financing for infrastructure projects comes from the major European banks, which are, to say the least, extremely stressed at the moment, and what capital they have is soaked up into the sovereign level. For the provision of substantial amounts of money, we are left with a few UK banks, the American banks and some of the Asian banks. Andrew Buglass can give you more details on this than I can, but the public bond markets are extremely wary of this space.

At the UK level, we calculate that the total of required investment across the utilities sector as a whole between now and 2020 is £240 billion—that includes gas, water and electricity—of which we are talking about directing roughly £100 billion to £120 billion into renewables. That would require a rate of expenditure of £25 billion a year; currently the rate is something like £12 billion to £14 billion a year. Can we maintain a rate of £12 billion to £14 billion a year? Probably. Can we double it in a very short period of time? That is extraordinarily questionable. The equity market is closed, in essence, and people would need to raise substantial amounts of equity to bridge the gap. The debt market is not exactly beating on the door, either.

Scotland is a subset of the UK target, and perhaps more could be done on what part of the pie that is available for investment is allocated in Scotland. Also, Scotland has to work on its own numbers. According to Scottish Renewables, £750 million was invested last year. In our submission, we said that the Scottish target would cost £46 billion, which I think is consistent with the road-map document. We are talking about upping investment from £750 million to £6 billion or £7 billion a year in a very short period of time—that is, now—and, again, we must ask whether that is really feasible. It might be, if virtually all the UK investment goes into projects in Scotland, but that is pretty unlikely.

The overall position for financing is grim. I described it as dire when I was here in December and it certainly has not got better—in fact, it has got worse. In the European context, the investment is not there to meet the overall goals. It is possible that enough of whatever is available will find its way to Scotland, but it is unlikely.

Dr Mackie: That is the situation as it is; we have to look forward. The fact is that the equity world—the people with money—will put more and more into renewable energy projects in future years. It will have to do that, because otherwise the world will come to an end—if you will allow me to be dramatic.

Scotland's target of 100 per cent renewable energy is doable. Every investment in renewables is important to explore, but wind power is what I know about and I can tell you that 10,000 3MW windmills in Scotland will deliver the whole of Scotland's electricity energy, as I said in the little briefing that I provided. That is fact, and I am talking from my experience of what can be done with wind power. It will require about £40 billion, which in today's world is not a lot of money. The banks will be delighted to put money into the sector, because of the returns, given energy costs.

We must move forward and lead the equity world into investing, instead of just saying, "Oh, they're terrible, they're not doing it at the moment." Those guys have to take us forward and see the huge opportunities. If they do not do that, the lights will go out.

Rhoda Grant: The global economic crisis is obviously affecting investment. Are there other issues that can affect investment? If other investment is not generating enormous profits and investment in renewables has the ability to do that, as Dr Mackie said, should that not pull money in from the equity sector?

Peter Atherton: I should perhaps put things in a little more context. The European utilities sector, which is the fourth largest sector in the equity market—or was, until recently, when it dropped to fifth place—has been de-rated by 40 per cent relative to the wider market since 2009. The sector has underperformed by 40 per cent. In a world that is going to hell—to coin a phrase—we would expect the utilities sector to do really well. It should be outperforming. Indeed, in north America, Asia-Pacific and Latin America the utilities sector has enjoyed the safe-haven effect; it is performing well in those markets. The situation in Europe is unique.

There are several reasons for that, which I would be happy to go into, if the committee would like me to. One of them is exposure to renewables. Renewables are turning out to be extraordinarily expensive and not a great investment from the utility companies' perspective. From an equity market perspective, renewables have not proved a good investment when it comes to manufacturing, either. The only way in which you could have lost more money in the past three or four years than you could have done by investing in utilities would have been for you to have invested in the stocks of the manufacturers of renewables equipment.

Rhoda Grant: Can I stop you to clarify something? Is that because the investment is happening up front and the profits are not coming back yet, or is there an issue that is built into the renewables sector that we need to deal with?

Peter Atherton: The equity market has become extremely concerned. In essence, the returns on such investments are entirely dependent on Government policy and Government subsidy. Around Europe, we are finding that, in difficult times, Governments are not necessarily following through on all the promises that they made several years ago to provide returns on such investments. When a Government faces an affordability crisis—a situation in which prices are about to rise very substantially, partly because of the impact of renewables—it faces a choice about whether to stand behind the promises that it made to the developers of those renewables to give them a 12 to 15 per cent return, or whether to keep prices for the consumer down and backtrack somewhat on the promises that it made to the developers.

So far, there has been only one answer. In Spain, Portugal, Italy, Belgium and the Czech Republic there have been substantial changes to or reductions in what was promised to developers. That is making the equity markets extremely wary of providing lots of investment. Investment is going on, but there has not been a huge step up in investment.

On the manufacturing front, most of the key listed manufacturing companies are down by 90-plus per cent. Vestas peaked at a share price of 700 krone; it is now trading at 40 krone. Gamesa is down by 95 per cent. Five or six of the solar companies in Germany have gone bust in the past six months and many more are struggling. In 2003, the market cap of the listed renewables manufacturing companies in Europe was about €5 billion. It increased to €60 billion in 2008—that explosion in value was a result of the renewables directive and lots of companies coming into the market. Today, the total market cap of all the major listed renewables manufacturing companies in Europe is only about €4 billion, which represents a decrease of more than 90 per cent.

For investors, the context is one in which the utility companies' share prices have been dire—they have struggled—and the renewables manufacturing companies are a catastrophic investment. None of that adds up to a pleasant investment environment in which people are looking forward to the prospect of doubling, tripling or quadrupling their exposure to that market.

The position can change. Stock markets and investment environments change over the years. I am not saying that the present situation will last for ever but, at present, the idea that the capital markets will double, triple or quadruple their exposure to renewables, given the performance over the past three or four years, is borderline fantasy.

The Convener: That was all very cheerful.

Dr Mackie: Would you mind looking at page 10 of the booklet that I provided, which shows what is available? All that talk about the equity markets having a tough time is interesting, but if you flip to page 10 of the booklet, you will find a table with the heading, "The Financial Fundamentals of Wind Power", which shows where money could go. I know the figures inside out and I stand by them. The potential return on an investment in a 3MW installation is something like 11 per cent, plus 6 per cent interest—in other words, it is about 18 per cent. With an 80 per cent equity gearing, you get a return on your investment of between 45 and 48 per cent. That is the trail that will take the equity market down this road. The potential is huge.

The Convener: But, as we have just heard, the problem is that, for whatever reason, the equity markets do not believe that.

10:30

Dr Mackie: The challenge for you guys—that is a generic term nowadays—is to help them to believe it, and to set up planning processes that make it much easier to build decent wind power installations. It is not only about wind power—that is just what I know about; there is hydro and everything else. However, onshore wind—especially the big turbines—is by far the most financially and physically effective renewable energy installation at present. It is twice as effective as offshore wind, but we need the whole damned lot.

The Convener: Okay. Mr Atherton wants to come back in with a comment, but Mr Buglass can go first.

Andrew Buglass: Peter Atherton correctly categorised the equity side, and he is right to reference the impact of the financial crisis on the European banks in particular. To outline the overall debt market context, before the 2008 crisis around 50 banks were providing finance for projects of that type, whereas right now about 20 banks say that they are doing so. We were the number one lender last year—we were out there doing those transactions frequently—and members should believe me when I say that the real number of banks that are lending is probably rather smaller than 20.

There is without question a reduction in debt market capacity overall, but banks such as RBS that are willing and able to provide funding still view renewables as an attractive sector with good returns and well-structured projects. There is funding available, albeit that the whole market availability—largely because of the impact of the crisis in the continental banks—has reduced as a total quantum.

Peter Atherton: The incoming coalition Government recognised that there was likely to be a substantial funding shortfall, which is why it took the electricity market reform approach. The whole point of EMR is to broaden the investor base to non-traditional utilities and deepen it so that companies can do more within their current balance sheet and attract additional investors. Whether that will be successful is open to question, but that was the point.

Paul Lewis: Peter Atherton and Andrew Buglass have described the current position. One of the challenges, therefore, is how we build the confidence of the debt and equity markets in the deliverability of some of the non-proven technologies that Andrew Buglass mentioned at the start. That involves addressing a series of issues to do with EMR, planning and consenting, skills, the supply chain and—in particular—cost reduction. The market needs to know what action is happening in those areas that can start to build the confidence of the equity and debt markets as the opportunity develops.

Rhoda Grant: I have one final question—I am sorry that I have taken up a lot of time. Our inquiry involves scrutinising the Scottish Government's policy. What should we tell the Government that it must do to overcome those issues?

Dr Mackie: There are two things. First, we must mature the green investment bank as fast as we jolly well can, because it will focus on the routes that we are now speaking about. Secondly, we must make much more of the community and renewable energy scheme by making it possible for the 1,000 potential site owners out there to go through the planning process and get funding. It is a good idea for them to get funding: if they do not get planning permission, they do not have to give it back, and if they get permission, they give it back, plus a heap of interest. There are plenty of players out there who will take that.

You have put together CARES, which is a peanut scheme. It is a good scheme and a good idea, although I cannot think where it came from. However, it is far too small: it is enough for 20 or 30 installations per year, not 300. It is run by Community Energy Scotland—I have a lot of time for that organisation, but it builds too much on communities before they get the money rather than getting entrepreneurs here and there to make funding available.

We must get the entrepreneurs in the rural sector to put their heads up and have a go, and then bring in the community, rather than starting with the community. That is debatable, but I guarantee that there are many people like me out there who will be delighted to bring in communities as investors in what they are doing in their areas.

The CARES concept needs to be built into a £50 million scheme instead of a £5 million scheme. It is at £25 million now, but it is 90 per cent community orientated rather than 10 or 20 per cent community orientated. It is necessary to have a decent fund to get people in the rural sector to put their heads above the parapet and have a go.

Paul Lewis: The Government can do a few things. Policy certainty is important, so continuing to keep the targets as they are sends a powerful signal internationally. Continued progress on planning and consent with Marine Scotland is also important. It is important to invest in cost reduction, as the Government is doing in a number of ways, but in particular through working with the UK Government on EMR, because clarity on EMR as soon as possible would be a huge win.

Andrew Buglass: I agree absolutely with Dr Mackie's comment that the green investment bank can be a focus for change. We have been a big supporter of the green investment bank coming to Edinburgh and we are delighted that it has done. There is a lot of potential for that institution to be transformational.

To return to the original question, we perceive non-financial issues to be one of the biggest challenges. Many good projects are stuck in various stages of planning, or there are issues around access to the grid or radar objection. The Scottish Government has done quite a lot of good things on those issues; indeed, it has probably been a lot more proactive than the Westminster Government. That can unblock a large number of the projects that are in the pipeline, which are the sort of good projects that banks such as ourselves would love to fund.

The Convener: A number of other members will come in on the same general theme.

Patrick Harvie (Glasgow) (Green): Good morning. Paul Lewis's last comment perhaps touched on the issue that I will raise. One of Mr Atherton's arguments, if I understood him correctly, was that meeting the targets will require substantial subsidy and policy support from the Government. Is that not the case with all the energy choices that we might make? We could decide to burn all the coal and that would require the Government to say, "We don't care about climate change and we will permit high-carbon developments to happen." A policy choice is therefore required. We could go the nuclear route, but it is clear that the companies that are looking to develop nuclear are not willing to do so without substantial subsidy, so that would require subsidy and policy support from the Government.

If we want the renewable option, is it not clear that the last thing we should be doing is

questioning or undermining the renewable energy targets? Is it not clear that having ambitious and legally binding climate change targets creates exactly the right context? We need that subsidy to be there and we need policy consistency. If we are to give anybody confidence that those subsidies will be there for the long term, the last thing that we should do is undermine the whole project. Is that not the case?

Dr Mackie: Yes; the subsidy element is important. It is crucial to bear it in mind that, if you lead the country down the road of not only decent-sized turbines but hydro and so on, big turbines currently require only 4p subsidy—or at least that is what they get. Do not tell anybody but, if the truth be told, they do not need it all. We will not tell anybody that.

The Convener: It might be too late for that now.

Dr Mackie: Without a shadow of a doubt, subsidy is leading investment. However, where politicians—well, it is the system, not just politicians—have gone wrong is in giving huge subsidies such as 40p to solar and so on. That is colossal when you think about it, particularly for small turbines.

When the price of energy doubles in the next five to seven years, as it undoubtedly will—*The Scotsman* says that today, and I said it a year ago—we will not need those subsidies for the big, efficient units. However, colossal subsidies will still be needed to make some people put up turbines. We farmers know about subsidies; we know them very well. I say to my friends, "The subsidy is there, so milk it—use it." It is a crazy space.

I have to say, Mr Harvie, that the subsidy does one piece of good, because it makes people think about saving energy and about the environment and so on. If everybody put together the money that they spend on small things and spent it on big things, they could get the same output for a sixth of the cost. You guys have to think about all the issues. The subsidy is important to leading us down the road but, as energy demand rises, the efficient units will not need it.

Paul Lewis: The point on policy and tax is important. Policy serves to do a number of things. It gives confidence to the industry and it is a call of arms to the industry to react and respond. The targets that Scotland has set are, clearly, ambitious, but they are highly regarded internationally. It is no coincidence that they have put Scotland at the forefront in this area. On the back of that, significant international players such as Mitsubishi Heavy Industries and Samsung Heavy Industries are choosing to locate their interests in Scotland. The certainty of the continuation of policy is an important driver in that regard.

Patrick Harvie: Is RBS considering aspects of the renewables agenda other than wind? We have spent a lot of time in this inquiry talking about wind—understandably, as it is a huge part of the picture—but how can we ensure, for example, that transport companies that might be replacing their fleet have access to the financial products that might support them to replace their fleet with electric vehicles as they become available? How do we finance the installation of charging points around the country? The heat targets are relevant, too. What is RBS doing in those areas?

Andrew Buglass: I am glad that you asked that question. As I said, our focus on the generation side has been on what I would describe as proven technology, such as wind, solar and biomass. There is a large growth in biomass technologies, which can be deployed at scale and which have the benefit of not being intermittent generators.

We recognise that there is a tremendous amount that must be done across industry to provide support for demand management, which is a critical aspect of the equation. Every megawatt hour that we do not need to generate means that we can meet demand with a proportionately higher percentage of low-carbon generation than would be the case if we needed to keep the old coal-fired generators, for example, on the bars.

There is a lot that needs to be done. We are actively considering ways of working with our clients. Over the past couple of years, some of our colleagues have been working with companies such as Honeywell and other service providers on ways in which we can provide energy management services. We would provide the funding for the equipment that is installed, and those companies manage the process for a small or medium-sized enterprise that needs to manage and reduce its electricity consumption and reduce its emissions. The savings are shared between the service provider and the business that has installed the equipment.

We are at the early stages of doing that, but we are significantly further ahead on that score than most of our competitors are. We are working hard on the issue.

The Convener: Angus MacDonald has a question in a similar vein. I will let him ask his question, then Dr Mackie can respond to it as well.

Angus MacDonald (Falkirk East) (SNP): There is a great deal that we could be exploring this morning, given the panel that we have with us. Two and a half hours is not enough time to do the panel justice. My question is directed to Andrew Buglass and, perhaps, to Paul Lewis.

I have a special interest in district heating. In recent weeks, the committee has heard about investment barriers that are associated with district

heating schemes. We have covered the barriers again this morning, but is it realistic to expect funding to materialise for district heating schemes from, for example, combined heat and power plants in the foreseeable future, given what Mr Atherton has said about equity investment effectively being closed? The issue is an aspect of renewables that we have to move forward at a quick pace.

10:45

Andrew Buglass: I agree. That is an important part of the mix. It is also important to highlight that that is still an emergent area and that the banks have not been funding it under the renewed arrangements.

Combined heat and power is, of course, nothing new. The bank has been funding that technology through large-scale schemes in the UK and elsewhere in Europe for a long time, so the technology is proven. The bigger challenge is around the implementation of the renewable heat incentive. Early indications are that companies are struggling with some aspects of the legislation, which to an extent is still in development. From a lender's perspective, I would say that we are probably not quite there yet, to be frank, because the implementing legislation needs to be clarified, available and properly implemented. Once that has been done, good schemes from experienced parties will find support. It is interesting to note that MVV Environment Ltd, which was referenced earlier I think, and which is an experienced developer of such projects, has said quite bluntly that, under the RHI as it stands, it does not think that it will be able to progress such projects.

My sense on Angus MacDonald's question is that there is significant need and opportunity, but project developers need to win that comfort with regulations and framework before they are able to bring projects to the banks to ask for lending.

Angus MacDonald: The draft UK energy bill that was published last week gives a degree of comfort. Hopefully, it will allow the banks to look at further investment.

Andrew Buglass: The draft energy bill is an extremely complex and broad document. It is an ambitious attempt at a wholesale transformation of the UK energy supply business. The Government has done a good job with such complex legislation, but the devil will be in the detail.

It is helpful that elements of RHI are beginning to come out in the EMR legislation, but we will have to wait for the implementing framework before we can see how it really pans out. With the right level of support and clarity, I think that banks will be prepared to fund district heating schemes.

Dr Mackie: Demand management, smart grids and efficient use of energy are fundamental. I will annoy you all again by asking you to look at page 19 of my booklet. [*Laughter*.]

I could easily laugh along with you, but this is fundamental. The insert at page 19 shows a graph and there is not another graph like it in the world. It shows Mackie's experience of wind power production. The horizontal line shows months, and the vertical is the amount of energy that has been produced or used. Without wind power, this little business of ours was buying about 250,000kWh per month. If you take a look along the line from when our three windmills kick in, you can see that we require to buy much less energy. That goes back to Mr MacDonald's point about demand management.

The fundamental bits of the chart are the yellow part, which shows the power that we use for running the business, and the green part, which shows the surplus energy that we produce. All the yellow and green bits mean that we are saving fossil fuels somewhere for all the other uses. We need to get that clear—it is colossal when you see it. The fun bit is the green bit. With Scottish Enterprise, we are investigating the real practical development of a process to turn that green bit into hydrogen, which is a developing market that we could plug into, and ammonia. Please know that the world will run out of food if we run out of energy, because half the world's food is based on ammonium nitrate, which comes from gas. Just imagine the efficiency in Scotland with 3MW turbines all over the place, producing hydrogen to power buses and turning hydrogen into ammonia. Along with Scottish Enterprise, we are looking at developing that.

Folks, just think of the opportunity of the emerging distributed wind power. I am stuck on wind power because I know about it, although I am not saying that it is the only way forward. However, there is huge potential to turn that power into hydrogen and ammonia. There will then be anhydrous ammonia all over the countryside to produce all the food, as well as the hydrogen for the buses in Aberdeen. There is a huge opportunity, which is far more important than simply demand management, to develop that innovative project to the next stage. Energy storage is where we have to go. The insert on page 19 of my booklet is important.

The Convener: As a matter of interest, who are Margaret, Matilda and Mirabel?

Dr Mackie: Those are our three turbines.

The Convener: I know that, but who are they named after?

Dr Mackie: They are named after my three old girlfriends. [*Laughter*.]

The Convener: I am amazed that there are only three.

Paul Lewis: I want to respond to Mr MacDonald's question on district heating. Andrew Buglass described some of the challenges of the RHI, but also the opportunities. I want to reinforce the point that we are looking at that. The area has been identified for potential use of the fossil fuel fund to try to de-risk some of the projects that currently, under district heating regulations, cannot attract the sort of investment that Andrew Buglass would bring. Through using the fossil fuel money, projects could perhaps share some of the risk and take some of it away, which would allow more private finance to come in. We are continuing to explore that issue, and I hope that we will soon see outcomes from that.

Peter Atherton: I want to return to Mr Harvie's question on targets, as I did not get a chance to answer it. The issue of the impact of targets on capital markets is interesting. Targets can galvanise capital markets, as happened in the mid-2000s when we moved off on the renewable way. However, they certainly can become counterproductive if they are deemed to be unrealistic and drive bizarre policy decisions, although that is probably not the right way of describing them—I mean policy decisions that are not necessarily believable or helpful. We advise investors to do their own calculations on affordability, which is the crucial issue for investors. We tell them not to trust the promises of today's Governments that the consumers of the future will pay. We advise investors to make their own calculations of whether the impact on future bills will be such that consumers five, 10 or 15 years hence will be able and willing to pay those costs. We do not ignore targets, but we try not to take them at face value.

Mr Harvie talked about nuclear. The committee might want to ask itself why the UK Government is so keen on nuclear and why the Lib Dems have had a conversion to it. The simple answer is that we cannot hit the 2030 targets in any realistic way without nuclear. We cannot get down to 50g of CO_2 intensity without a substantial amount of nuclear and keep the lights on. It is almost impossible to imagine a scenario in which that can be done, which is why the UK Government has become so interested in nuclear. The 2030 target is driving that view on nuclear. The question is whether that is a rational decision, given the current price of gas and how nuclear costs might turn out.

Chic Brodie (South Scotland) (SNP): Good morning, gentlemen. When I heard Dr Mackie talk about the experience of Mackie's, I thought, "Oh no. Not 'I am the experience.'" We have heard "I am the evidence" before. However, I thank you for being somewhat positive.

The half-empty glass is in front of Mr Atherton. Last year, you said of the renewables industry that

"post-2015 ... the industry is planning to fail."—[*Official Report, Economy, Energy and Tourism Committee*, 7 December 2011; c 717.]

You emphasised today that renewables are "not a great investment" from an investor's perspective. You gave the caveat that you do not speak for Citigroup. Given your history, I suspect that we know who you speak for. However, you are employed by Citigroup. Citigroup and Google have just invested $55 million each in the Alta Wind Energy Center in California. Do you find that you directly oppose what your company is doing?

Peter Atherton: I have never heard of that investment. If I was directly opposed to what other elements of my bank were doing, that would be perfectly understandable and would be part of my job.

Chic Brodie: Citigroup is in favour of that, but you are against it.

Peter Atherton: I have no idea what Citigroup is in favour of in terms of its—

Chic Brodie: Your website says that Citigroup has invested $55 million in the Alta Wind Energy Center in California.

Okay—let us carry on. I will talk about nuclear power. I return to your caveat about who you do or do not represent. You said that the coalition Government is in favour of new nuclear stations. Will you help me to understand why EDF Energy and Centrica are less likely to invest in the UK? Do you accept that the investment criteria for nuclear stations do not include their insurance costs? They operate by Government guarantee. If they bore the full burden of costs, nuclear power stations would not even be a player.

Peter Atherton: You asked two questions. Was your first question about whether EDF and Centrica are more or less likely to build stations?

Chic Brodie: Yes.

Peter Atherton: We have argued for a long time that the estimates that were made a few years ago of about £4 billion to £4.5 billion per new nuclear reactor would turn out to be way too low. EDF has not confirmed the recent press reports of a cost of £7 billion per reactor at least for the first two reactors. If such numbers are true, it will become economically very difficult to get new nuclear build, even with contract-for-difference backing.

A strike price of about £110 to £120 per megawatt hour would be needed at a 10 per cent

cost of capital. A more realistic 15 per cent cost of capital would give a strike price of £150 to £170 per megawatt hour, which would be even more expensive than offshore wind.

The way to get those strike prices down is to transfer risk. The crucial risk—the really big risk for private developers—is the construction risk. EMR does not envisage transfer of construction risk; it transfers power-price risk. The whole point of EMR is that it takes power price risk off the table and transfers it from the developer to the consumer. Without a substantial transfer of construction risk, we do not see how private investors can invest in new nuclear, so Centrica in particular would struggle. EDF is 83 per cent owned by the French Government—

Chic Brodie: I just wonder whether you can help me. Under the heading "Investment Instruments", page 5 of your submission says of the standard terms in contracts for difference that

"It is these terms and conditions and any incentives given to any company that invests in new nuclear, specifically EDF and Centrica currently,"

of which we have talked,

"that will be of most interest to investors as well as politicians."

Why does your submission not reflect what you are saying now?

Peter Atherton: That quotation refers to the side agreement. The Government has set up a side process that allows early-move projects to go ahead before EMR is passed into law. Those projects could involve offshore wind, but in fact they are mainly the first nukes.

However, we have not seen what the side agreements will look like. We know that they will look something like the CFDs, because they will guarantee revenue, but we do not know what the terms and conditions will be. We expect greater clarity on that towards the end of the year, which is when Centrica and EDF have said they will make their go or no-go decision on the first two reactors.

11:00

From a Centrica shareholder perspective, if they decide to invest in new nuclear, the markets will judge the investment on the terms and conditions of the contract, so that is what we will need to see. From a politician's perspective, you will want to see what the strike price is and how much future United Kingdom consumers are being committed to paying for those assets. If the construction cost rises as we expect it to—although we have no confirmation of the £7 billion figure—the only way to keep the strike price down is to transfer risk, and the risk that everybody is worried about is construction risk.

Chic Brodie: Thank you for being so direct and honest about that.

The Convener: Dr Mackie wants to comment.

Dr Mackie: My view, based on my knowledge, is that Scotland does not need nuclear. I am not against nuclear, I hasten to add. It is clear that the Government can reach its 2020 targets through onshore wind, offshore wind, tidal power and so on. The sums show that those will be far cheaper in the future than nuclear power will. We do not need to worry about nuclear in Scotland: the Government has got that one right. As long as the substantive renewables investments are made—in my case I am suggesting investment in wind power—there is no need to worry about nuclear.

Incidentally, nuclear scares the proverbial out of me the more I read about it. There are 420 nuclear stations in the world right now. We have had three disasters and 12 near disasters. If we have 4,000 or 40,000 of them, there is bound to be a nuclear disaster, and a nuclear disaster somewhere is a nuclear disaster everywhere. The fewer of those damned things we have, the better.

Finally, as I am sure the committee will know, nuclear power is not a renewable energy. According to the United Kingdom Atomic Energy Authorities, we have about 100 years' worth of uranium at current levels of use. However, if use goes up by 2 per cent a year, the amount of uranium will come down by a half to two thirds. We must realise that.

Focus on renewable energy, guys, and the world is ours. The sun produces far more energy every day than we need, but we must have the mechanisms to catch it and store it.

Chic Brodie: I have a final question for the panel, but particularly for Mr Buglass and Mr Lewis. The draft UK energy bill proposes using CFDs as instruments that will provide, it is hoped, long-term revenue certainty for investors. What are your views on the extent to which that stable revenue level will reduce investment risk and financing costs, on how competition will be affected and on whether the bill will increase the availability of finance in Scotland?

Andrew Buglass: That is quite a wide question, but it is a very good one. It is important to step back for a moment and to consider what sort of things drive the availability of finance for projects such as those we are considering. That can be summed up by three key elements from a policy perspective: whatever is done needs to be transparent, predictable and durable. If we have those conditions from whatever incentive scheme exists for the technologies that currently require incentives, our track record and that of other banks who have been lending to the sector for a long time shows that projects can be funded.

Lenders get very concerned—indeed, this applies to all investors and not just to lenders—when one or more of those elements is not there or is not at the level it is perceived that it is at in other countries.

Peter Atherton rightly referred to a number of countries in Europe that have had various mis-steps along the way recently in their implementation of and continued support for the renewables sector. Investors react quite swiftly to that. They will defer investment when there is uncertainty and they will divert it if there is prolonged uncertainty or there is a more attractive opportunity elsewhere. The key point from my perspective is that if EMR provides the three things that I mentioned, funding will remain available.

It is beyond question that during the past two years, when EMR has been under development and subject to consultation—during that period we have engaged extremely closely with the Department of Energy and Climate Change, other UK Government bodies and officials in the Scottish Government—the process of making a very ambitious set of changes has led to some delay. There are projects that would have proceeded more rapidly had the developers not understandably paused while they worked out what the new arrangements will be and what level of certainty and security they will provide.

On whether the draft UK energy bill will provide features that enable more funding to come forward, if it produces a stable, transparent and predictable framework I think that we can put behind us the hiatus of the past two years. The sector itself remains attractive for investors, whether they be debt or equity investors, as I said, and there are tremendous opportunities, specifically in Scotland, given its resources and potential and given the Scottish Government's strong support for the renewables sector. Across the UK there are good opportunities—it goes all the way down the supply chain, which is a critical issue that we, as a country, need to seize.

Provided that those conditions are met—that is the huge and critical proviso—the draft energy bill can be a positive enabler. However, it is important to reflect that although the bill is extensive and has lots of detail, there is still much more detail to come. I cannot say categorically that it will do everything; I hope that it will, but we do not know.

Paul Lewis: Andrew Buglass summed up well the reaction to the draft energy bill and the market's need for confidence about and consistency in the regulatory regime.

It is important to recognise that there are things other than EMR that will build confidence. We talked about Scotland's progress in planning and consenting, which is a key enabler in building in the investment community confidence to make available the funding that will be required.

We need to have confidence that the current levelised cost of energy in some aspects of renewables is coming down. Innovation, as a means of reducing costs, is a huge opportunity and a huge area for investment in Scotland. There is the technology and innovation centre at the University of Strathclyde, and UK investment is coming to Scotland through the Technology Strategy Board's catapult centre. Those are signals to the market and the industry that they should be confident.

Finally, it is important that we get onshore and offshore test and demonstration established, in order to provide the reliable data that will build confidence among people like Andrew Buglass and his colleagues, who will provide the necessary finance. Scotland is in a leading position in relation to test and demonstration infrastructure.

All that should give us confidence that we are, provided that EMR provides a consistent and reliable framework, in a good position on which to build.

Peter Atherton: EMR is proving to be extraordinarily difficult for the Government to implement successfully. Two years into the process we still do not have a viable form of the CFD arrangements, which is of substantial concern, certainly to the equity market.

In fairness to DECC, we have to stand back and ask why implementation is proving so difficult. It is difficult because DECC is trying to do something that is really, really hard. It is trying to reform in a very short time the electricity generation sector, from being predominantly fossil-fuel based to basically excluding fossil fuels—killing coal by 2022 and phasing out gas later in the decade—to transform the electricity industry into a nuclear-heavy and very renewables-heavy industry.

That would be a really big challenge even if there was unlimited capital, but there is not unlimited capital by any stretch of the imagination. It would also be a really difficult thing to do even if we did not have to worry about keeping the lights on, but we do have to worry about keeping the lights on, both during the transition phase and beyond that point. We also have to worry about affordability for the consumer. The Government is trying to reconcile all those drivers in the same piece of legislation, which is proving to be extraordinarily difficult.

The UK Government is by no means alone in this. Governments across Europe are finding it profoundly challenging to implement the decisions that were taken at EU level in 2004, 2006 and 2007. Those decisions put them on a path on

which their energy policy would be driven almost exclusively by the climate change agenda, and when those decisions were made they paid very little—if any—attention to security of supply and affordability. As governments are having to implement those policies, they are finding that they have to pay close attention to affordability and security of supply in a profoundly different economic environment. Therefore, all governments across Europe are finding it hard. Whether EMR is the right answer, and whether it is the right answer for the UK, only time will tell.

The Convener: I ask Dr Mackie to hold fire because Stuart McMillan wants to ask a supplementary question.

Stuart McMillan (West Scotland) (SNP): My question is for Mr Atherton and follows on from Chic Brodie's questions. You were discussing the cost of building the new nuclear power stations and the vast challenge in that, but you did not mention what happens when a nuclear power station comes to the end of its life and the cost of decommissioning. It is currently taking place in the UK and the taxpayer is paying a heavy price for it. When you look ahead and estimate the cost of the new nuclear power stations, do you ensure that that includes the projected cost of their decommissioning?

Peter Atherton: We do that when we model for nuclear power stations. The proposal for the new wave of nuclear power stations is a pay-as-you-go fee ranging from £1.50 per MWh or maybe a little higher. We allow for decommissioning in our cashflow models.

Dr Mackie: I have a quick follow-up comment on something that Peter Atherton said. At the moment, we are all tackling energy from the point of view of the climate change agenda, but I seriously believe that energy security should be the first agenda. Fortunately, however, that deals with climate change, as well. We should all focus on—it is a stupid phrase—keeping the lights on, which means that you guys must come out of the woodwork and help to deal with the anti-wind lobby. The situation is the same as it was in the 1940s, when my parents complained about the new pylons crashing across the countryside. We must get the people out there in the world to understand that it is a sine qua non that we must go down this road. One huge wind turbine is a lot better than three, five or six little ones.

Paul Lewis: As well as all of that, let us not forget the significant economic prize that a low-carbon economy represents for Scotland. It is a hugely important opportunity for our future economy.

Mike MacKenzie (Highlands and Islands) (SNP): My questions are directed to Mr Atherton. I am sorry to say that you seem to be the most pessimistic individual I have come across for a long time. You seem to carry a cloud of doom, gloom and depression about with you. I am trying to understand what you are saying fundamentally. Is it your position that we are staring into the abyss of economic and energy armageddon and that, therefore, we should just give up?

Peter Atherton: No, I am not saying that at all.

11:15

Mike MacKenzie: I am sorry, but that is how it is coming across.

Given that markets are often fickle and often get it wrong, I wonder whether in the slightly longer term we simply need to apply some reason and have some vision. Do you not agree that with 10 per cent of Europe's wave potential and roughly 25 per cent of wind and tidal potential Scotland has a strategic economic advantage and unique opportunity that we would be wise to follow up?

Peter Atherton: I look at this from the perspective of an equity analyst who covers the utility companies that provide the investment. We also look at the issue in the round with regard to the returns to capital markets and rich rewards, so I have to say that what you are asking me lies slightly outwith my remit.

In response to your question, however, my answer would be no. If Scotland's renewables road map was a business plan that a company was presenting to me, I would conclude that it was based on two big bets, the first of which is that fossil fuels in general are going to rise greatly forever. If you take out a derivative on fossil fuel prices, you are taking a very long position on oil. Secondly, you are betting that consumers in the UK or elsewhere in Europe are willing to pay for all this. Those bets might be reasonable, but I am not sure that I would put £45 billion or the economy of Scotland on them. You might want to slow down a bit and see whether those assumptions turn out to be right.

Mike MacKenzie: Do you agree that as fossil fuels begin to run out around the world the price is inevitably going to rise?

Peter Atherton: No. With the greatest respect to Dr Mackie, the world is littered with people who over the past 30 or 40 years have called fossil fuel prices wrong. A good example that the committee should take into account is France in the 1970s. Following the oil price shocks, France decided that fossil fuels were going to be scarce and would rise in price for ever and ever, so it built a massive nuclear power industry to protect its economy and to ensure that it could do without fossil fuels in its power production. It also believed that it could

develop a massive industry that it could export around the world, thereby creating enormous value. However, the French got it profoundly wrong. Just as their nuclear industry was reaching its zenith in the mid-1980s, oil hit $10 a barrel and, as a result, they missed out on 25 years of low fossil fuel prices and the arrival and availability of gas. Did they develop a world-leading industry? Yes. Did that lead to an industrial renaissance in France and did they sell hundreds and hundreds of billions of pounds of reactors around the world? Not at all. Will fossil fuel prices be high for the next few years? Sure. Will they be high in 2025? I have absolutely no idea—none, zero, zip—and no one else has.

The Convener: Dr Mackie wants to come in.

Peter Atherton: I say with the greatest respect that everyone has an opinion but no one knows for sure.

Dr Mackie: I have more than an opinion—I have read a lot about this issue. Despite shale gas and whatever else, the world is running out of fossil fuels and we have to fill this increasing gap with renewable energy. You cannot get away from that. As for using old examples, I have to say that you must not let history cloud your judgment of the future. You must look at the future as it might be and solve the problems. We will solve them, because there is plenty of energy, but to suggest that we are not running out of standard fossil fuels is a heap of crap. We are running out of them and we have to fill that gap.

The Convener: I think that that was unparliamentary language, Dr Mackie.

Dr Mackie: I am sorry—I will have to think of another expression.

The Convener: Although this discussion is very interesting, I am not sure that it is getting us very far. However, I will let Mr Atherton respond.

Peter Atherton: We often get asked what will make European Governments change the direction of policy in this area. It is difficult to see them doing that, but one of the things that could make that happen is the current north American energy revolution. People talk about shale gas, but it goes much wider than that.

I know that forecasts are often wrong, but Citigroup's commodity analysts and United States economists recently produced a report that concluded that the US is self-sufficient in gas now, and forecast that it and north America in general would become self-sufficient in oil by about 2017 or 2018 and a major net oil exporter early in the next decade, with an export capacity matching that of Saudi Arabia. Our economists forecast that that will add at least 0.5 per cent to US gross domestic product a year and create 3 million to 5 million new jobs directly and many others indirectly. Indeed, we are already seeing a major reindustrialisation of the US economy as heavy industry moves back onshore from offshore.

The question is what all that means for the international oil price. One can put together all kinds of scenarios. For example, will other countries follow suit and exploit the new technologies? Who knows? However, we know that a profound revolution is happening in north America. I have no idea where that will lead the world, but it certainly does not guarantee that in 15 years fossil fuel prices will be very high. All it does is raise the substantial question whether that will be the case.

The implications are already becoming clear. In the past seven or eight months, coal prices have fallen 40 per cent on the world market. Why? It is because the US is suddenly a net exporter of coal—

Mike MacKenzie: You are simply reiterating your previous point that you do not know what is going to happen, that the markets are fickle and that perhaps that is why we find ourselves in these economically challenging times.

Are you suggesting that David Ricardo's theory of competitive advantage no longer applies? Does Scotland not have a competitive advantage in renewable energy and, if so, does it not make sense to go in that direction?

Peter Atherton: Yes, I mean—

Mike MacKenzie: I am sorry—was that a yes?

Peter Atherton: I am straying into some controversial areas, but I have to ask: where is the competitive advantage here? I can see a competitive advantage in a UK context for onshore wind; after all, planning is more available in Scotland and wind conditions are slightly better. However, all the offshore wind projects so far have been built off the coast of England, so you could argue that, in that respect, England has the competitive advantage. Moreover, all the big biomass plants are being built in England. I am not sure where Scotland has this great competitive advantage. It is further—

Mike MacKenzie: I think that you have answered the question. Thank you very much.

The Convener: I know that other members want to ask questions, but we are already behind the clock and need to move on. The only point that I will make—and which I am sure Patrick Harvie was about to make—is that, when we consider all these issues, we also have to factor in our climate change obligations.

Angus MacDonald is keen to ask about jobs.

Angus MacDonald: Scottish Enterprise's submission refers to

"The analysis that underpins the 2020 Renewables Routemap"

that

"estimates the potential benefits of the offshore wind sector",

among which is the potential to create 28,000 jobs. How does that level of job creation compare with any other sector receiving £1.3 billion of investment or a country-wide programme of home insulation and other energy-saving measures?

The Convener: I believe that that question is probably for Mr Lewis.

Paul Lewis: The figures that you quote are not from Scottish Enterprise but from the offshore wind industry route map. They assume that the industry will be able to reach its deployment targets and capture significant value in Scotland through supply chain developments, manufacturing investments and so on. As I have said, we are seeing possible signs of interest from major players such as Samsung, Gamesa and others that are investing in Scotland. Those figures are the industry's overall potential job creation targets for offshore wind and, as you suggest, reflect significant opportunities for the economy with regard to the supply chain, manufacturing, R and D and other jobs.

The Convener: To be fair, I do not think that that quite answered Mr MacDonald's question, which was how that return would compare with investment in other industries.

Paul Lewis: In comparison with other sectors, I think that the figure for the return on investment, in terms of both jobs and value creation, was about £7 billion. The return to the economy from that investment is substantial and, compared with returns from other sectors, is of a high order.

On Mr MacDonald's question about energy efficiency, I do not have specific data to compare offshore renewable job creation potential with energy efficiency. We tend to see energy efficiency at the company level as something that produces immediate productivity gains, but I do not have figures that project that through to 2020, to compare directly offshore wind and energy efficiency.

Dr Mackie: The issue is hugely important. One of the things that is missing in job creation in Scotland is the manufacturing side, whether it is for offshore, wave, my wind turbines or whatever. If you think about it, a wind turbine is a ship upside down. Why is manufacturing not happening in Clydeside or wherever? We need to put a lot of thought into making that happen, because that means jobs—real jobs.

Four international companies buying our wind power, taking their windmills from Germany or whatever and sticking them on Forestry Commission land—that is not jobs. That is crazy. Jobs mean taking all that land and allowing 100, 200 or 500 smaller firms, in local ownership, to invest in it. That does not create jobs, but it makes money come in to the local scene, where the cash down creates jobs.

The committee needs to look at that Forestry Commission situation, because it is a colossal giveaway. I have a letter from Alex Salmond and Fergus Ewing saying that it is all right because those people are investing. They are not. Mitsubishi is not investing in a factory; it is buying our wind power and taking the financials away from it. All the subsidies that you and I are paying are going into it. Please think quietly about that. Ask Audit Scotland to have a proper good look at it, because that is jobs. Ownership makes jobs. Giving it away is not jobs.

Angus MacDonald: Dr Mackie, it may surprise you to hear that you have something in common with Mr Donald Trump, who was of a similar opinion.

Dr Mackie: I have nothing in common with Mr Trump, except that I am the authority. [*Laughter*.] He is a tremendous personification of arrogance and ignorance on wind power. He has a super golf course—I accept that—but he knows nothing about wind power.

Angus MacDonald: I tend to agree with his point on the importation of wind turbines from China, though.

Paul Lewis: Manufacturing is a huge part of the job creation potential for Scotland of the renewables industry. Elements of that will be done through the Scottish supply chain. Companies such as Steel Engineering and BiFab, which are based in Scotland, are already investing and expanding on the back of the offshore renewables industry.

On the issue of value creation, if 45 per cent of the value of an offshore wind device is in the turbine, it is important that we ensure that those companies that make turbines are able to do so in Scotland. There are two reasons for that. First, those companies bring direct employment, which we should welcome. Secondly, the industry is evolving, and the current devices are not the devices of the future. The testing and development of devices in Scotland by the major global players will provide a huge source of innovation and future development. Scottish-based technology companies, such as NGenTec Ltd, can be part of 7MW or 8MW devices in future.

The industry is important for two reasons—directly, in terms of the employment that it brings,

and because of the opportunity for Scottish supply chain companies to work hand-in-glove with major global original equipment manufacturers. We should welcome that.

Peter Atherton: Any jobs that are created in onshore and offshore wind are incredibly expensive, so there has to be a very different reason for doing that, other than jobs. If you hope to provide a stimulus to the economy and create jobs, I cannot think of a worse way of spending the money than on offshore wind. Onshore wind may be slightly better, but offshore wind would be a terrible way of spending the money.

I will give you a feel for that. With an offshore wind farm such as Greater Gabbard, local content is less than 10 per cent, so local spend is less than 10 per cent. Currently, the industry is working to an estimate of around 15 per cent for phase 2.5 to phase 3. There are working groups that are trying to get that up to 30 or 40 per cent, but it would still be a hell of a leakage in terms of the capital costs. At current power prices and current renewables obligation certificate values, a 1GW offshore wind farm would have a revenue of about £550 million a year at a 45 per cent load factor. Only £60 million of that would be spent locally on operations and maintenance, which amounts to about £60 a kilowatt. The rest of the money would go out of the area to pay interest and to provide a return. Out of the £550 million that consumers would pay, only £60 million would stay in the local area.

11:30

The Convener: Stuart McMillan wants to discuss Government funding.

Stuart McMillan: Before I do that, Mr Atherton said that investment in renewables was an expensive way of creating jobs, but the most expensive way of creating jobs is spending money on nuclear weapons, particularly if they are used.

I turn to the issue of Scottish Government funding and the opportunities to generate job opportunities in other areas of the country. I represent the west of Scotland. At the moment, many of the job opportunities that come to Scotland go to the east coast. In our inquiry, we have heard that, for the offshore sector, the cost of shipping out the equipment for installation is well in excess of £300,000 per day, so it is understandable that the east coast of Scotland is the main focus.

How can Scottish Enterprise generate interest from potential suppliers from the west coast of Scotland, the West Scotland parliamentary region and Glasgow and get them to realise that there are opportunities for them in the renewables sector, whether onshore or offshore?

Paul Lewis: I have a few things to say in response to that. You are right that, at this stage, we are seeing a lot of interest in east coast locations for offshore renewables. That reflects the timing of deployment and development of the various fields, rather than the east coast being more intrinsically attractive than the west coast. I think that the phasing of the roll-out of the industry will see some of the east coast sites in deeper water being developed at an earlier stage, with the result that deployment will take place from east coast ports.

However, there are two points to make about the opportunities that the west of Scotland has. First, there is a huge R and D and engineering capability in the west of Scotland. I mentioned the drive of the industry to reduce costs, which relates to Peter Atherton's assertion that this is an unaffordable industry. I think that the industry recognises that it is too expensive at the moment and is committed to cost reduction. Much of that process will be driven by innovation in the sector and much of it will be centred on the work that is happening in Glasgow at the technology and innovation centre and the Technology Strategy Board's offshore catapult centre, which is a collaboration between industry and academia that £150 million of investment is going into. There are significant job opportunities in the west of Scotland at that facility. Scottish and Southern Energy has 200 people in Glasgow on the back of that, and more companies, such as Gamesa, are carrying out R and D there.

Secondly, there is the engineering base in the west of Scotland. We are doing a lot of work to stimulate awareness of and interest in the engineering sector in and around the west of Scotland, which has a major role to play in the supply chain for offshore renewables. We are seeing some great interest in that. I mentioned Steel Engineering—

Stuart McMillan: May I stop you there? What specific measures are you undertaking? I pose that question because, on Monday, I spoke to a firm in the Inverclyde area that does a lot of work in the oil and gas sector. The potential exists for that company to go into the renewables sector, but it appeared to think that the renewables sector did not present an opportunity for it, even though some of the products that it makes could be transferable.

Paul Lewis: We will continue to do a lot of the things that we have done. On the specifics, we have run a series of awareness events about the opportunities, with the Crown Estate and other developers—I hosted an event in Glasgow 18 months ago and we have hosted others. We have a supply chain directory, which we publish on our website and are getting out to companies, to make

them aware of opportunities, and we have a series of expert help programmes, whereby we bring in support to companies that are not currently servicing the offshore wind sector, to make them aware of the opportunity and help them to make the transition into offshore renewables. We also offer a range of R and D and capital grants to support companies to make that transition. There is a lot of activity with a range of companies.

Steel Engineering is a good example; it recently received a regional selective assistance award. The company, which is based in Renfrewshire, regards offshore renewables as a core part of its future business. We have just invested, alongside the owners of Westway, in the enhancement of the facilities there, to allow deployment of the devices. We are doing a huge amount on awareness and support for individual companies, and there is infrastructure and R and D investment to support that.

Dr Mackie: May I say something in support of that?

The Convener: Briefly please, because we are well behind the clock.

Dr Mackie: R and D support in renewable energy in general and in new technology in particular, such as the storage of energy and off-grid applications, should be aligned with support to businesses, to enable us to get involved and use the stuff that comes out of the research. There is big potential to support R and D and to support the industries to use it in the longer term.

Stuart McMillan: I whole-heartedly welcome the initiatives that Mr Lewis talked about, which will increase opportunities in Renfrewshire. Of course, there is more to the west of Scotland than Renfrewshire. There are opportunities in west Dunbartonshire and Inverclyde, which have high unemployment, where there are businesses that could get involved with the supply chain, in particular. I am keen to understand what Scottish Enterprise is doing to ensure that those areas benefit from the renewables sector.

Paul Lewis: If you know of a company that is not engaged with us, we would be delighted to talk to it about specific opportunities.

Stuart McMillan: The business that I am thinking of has an account manager with Scottish Enterprise.

Paul Lewis: That is great, and I will ensure that our account manager is exploring renewables opportunities. We can provide a range of support to companies in the engineering sector, in the west of Scotland and elsewhere, to enable them to seize the opportunity.

I recognise that the opportunities extend beyond Renfrewshire. You will remember the work that was done under the national renewables infrastructure plan, which identified a range of opportunities in the west of Scotland. The recent consenting of Hunterston as a major test and demonstration site was very encouraging. I have emphasised the importance of test and demonstration, which will build the investment market's confidence in reliability and will offer opportunities to the supply chain to provide parts of components to devices that will be tested in Hunterston. That is a major asset for the west of Scotland and Scotland as a whole and is an opportunity for us to work with more supply chain companies. We are keen to do that.

Stuart McMillan: I will be happy to talk to you about that after the meeting.

John Wilson (Central Scotland) (SNP): I welcome the Royal Bank of Scotland's investment in the renewables sector. Mr Buglass, as I understood you—I might be wrong—you said that RBS has set aside £50 million to invest in small-scale renewables projects, of which £16 million has been committed.

Given some of the costs associated, building larger turbines in communities might bring greater benefits, as Dr Mackie asserted, particularly if the community is off grid. How does the £50 million that RBS has set aside tie into such investment for communities? What exactly is it buying? How do you define a small project?

Andrew Buglass: First, you are absolutely right—I mentioned a £50 million fund. Perhaps the easiest way of explaining this is to set out the context. This all started because our bank provides a lot of facilities to the agricultural sector; indeed, some of our many clients in that sector have banked with us for generations. They were beginning to see the sort of opportunities that Dr Mackie mentioned to put up one or two turbines on their land and, because of their long relationship with us, they approached us to discuss the matter. The initial challenge was the fact that, traditionally, we have funded larger-scale projects, which require very intensive due diligence with regard to the site and the chosen technology; however, such an approach is inappropriate for small-scale schemes. At the same time, as a bank and responsible lender, we do not want to back projects that ultimately do not deliver what they should. The last thing that anyone would want would be a series of constructed or, indeed, part-constructed projects that either do not work or deliver below their potential benefit and which saddle the developers with large debts that they are unable to service.

As a result, we felt that we needed a facility that focused on smaller projects, essentially at the 50kW or 100kW and one, two or three-turbine level. Of course, those are the smaller turbines

that Dr Mackie suggested we ought not to focus on in preference to larger equipment. However, in specific localities, they seem to be the appropriate choice. The scheme is very much aimed at delivering funding to RBS clients who wish to put in place either a wind turbine-based facility or the kind of solar installations that are typically to be found on farm buildings. The clients in question do not have to be in the agricultural sector, but so far the bulk of the take-up has been from there.

John Wilson: We have heard evidence that financial institutions are determining as part of their investment the size and scale of the turbines that should be installed. Dr Mackie has provided evidence to the committee—indeed, he made great play of the fact—that the economies of scale that are involved in installing larger-scale turbines of, say, 3MW rather than 100kW or 500kW turbines are enormous and the return to the communities on that investment is greater. It also means that we do not have a proliferation of hundreds of thousands of small-scale turbines.

Dr Mackie argues that 10,000 3MW turbines would generate enough power and energy for Scotland, but are we not missing a trick if financial institutions—not, I have to say, just RBS—are basing their investment strategy on what they think is best for a particular community, farmer or whoever else and funding small-scale turbines as a result? Should we not be seeking to produce more energy from larger-scale turbines instead of having a proliferation of small-scale turbines that will simply not provide the same return to communities?

11:45

Andrew Buglass: That is a very fair observation. As someone who has financed the energy sector for more than 20 years and who has worked for a number of engineering-focused companies as well as banks, I have reasonable knowledge of this sector. However, I believe that the last thing that we as a bank should be doing is making those choices for our clients. The fact is that clients determine what they want to build; they go through the tortuous planning process and resolve all the issues that they need to resolve to ensure that they have a deliverable project. At that point, we—and, I assume, other lenders, although I cannot speak for them—decide whether the project is sufficiently viable for us to support.

My key point is that we identified a gap at the smaller end of the market that was not being filled by the majority—if, indeed, any—of the other funders and we have introduced a facility that allows our clients to pursue such projects if they so choose. However, we are not going out and telling communities, "You should buy only this turbine." That is for them to choose, in conjunction with, I would hope, appropriate outside specialist advice. We do not choose the technology; we have views on it as we carry out the due diligence to ensure that our lending is prudent, but we do not dictate what gets chosen in the first instance.

Dr Mackie: I am terribly pleased with Mr Wilson's interrogation of this subject, because it is very important. I have to say, though, that I side with the banks on this issue; the RBS fund is worth £50 million, so Mr Buglass has to respond to his customers if they put together a good project. Good small-scale projects are happening purely because of the massive subsidies that are available, and the committee needs to put some thought into that issue. I say to my pals, "Good luck. Help yourself to these grants and get on with it." As a farmer, I know something about grants.

Another aspect is the restrictions that the planning process puts on scale. The planning people should be told that every restriction below an optimum height for an installation cuts down efficiency pro rata; in other words, if an installation is 20 per cent under its optimum 100m height, its efficiency potential, too, will be 20 per cent lower. As you know, I could go on and on about the planning process but the committee might well have the interesting job of trying to lead planners down more rational routes. The planning process should look at, first, whether the site is good and secondly, whether the project is a good size.

I will stop there, convener.

John Wilson: What types of project have been funded by the £16 million that has been committed so far from RBS's £50 million fund? I assume that they cannot all be wind projects; two weeks ago, for example, some committee members visited a number of small-scale hydro projects. I know that you cannot answer for other financial institutions, but can you outline the range of investment in renewables technologies at the smaller end of the scale?

Andrew Buglass: Certainly, and thank you for the question. At the moment, our focus with the £50 million fund is on wind and solar projects. Primarily, it all comes down to what our customers are asking for. Clearly there is some need to support small-scale hydro projects but the massive bulk of inquiries, at least initially, has related to wind; latterly, there have been inquiries about solar installations but, for fairly obvious reasons, they have tended to come from the more southern bits of England rather than from Scotland. The reality is that we respond to the market. Although we are not providing funding for hydro projects at the moment, we will certainly be happy to consider the matter if there is an upwelling of demand. I cannot speak for future policy decisions, but at the moment the focus is on wind and solar.

The Convener: That concludes the session. I thank our witnesses for participating in what I am sure members will agree has been a very informative discussion.

I suspend the meeting for five minutes to allow a changeover of witnesses.

11:49

Meeting suspended.

11:58

On resuming—

The Convener: We are running a bit late, for which I apologise to the second panel. Many of the panel members will have heard the earlier discussion, which I am sure you found as interesting as we did. You might want to pick up on some of the points that were made when we get into the questions. We have with us Duncan Carter, policy manager for energy regulation with Consumer Focus; Andrew Faulk, policy manager for energy with Consumer Focus Scotland; Guy Doyle, chief economist for energy and carbon at Mott MacDonald Ltd; Dr John Constable from the Renewable Energy Foundation; and Sir Donald Miller. Before we get into questions, would any of you like to make a brief opening statement?

Sir Donald Miller: I will touch briefly on two aspects of my evidence. The first is the cost of the energy policy to consumers and the second is the issue of how effective the policy is in reducing CO_2 emissions. In my evidence, I calculated the increase in energy prices to domestic consumers by 2020 as 58 per cent. That was based on published information from the Department of Energy and Climate Change in London and, with regard to system costs, on a paper by Colin Gibson, the former director for National Grid. In the calculations, I used the levelised costs system, which is what DECC used, but which I am afraid is a rather blunt instrument. There are better systems for calculating the costs to consumers, which are widely used in electricity supply systems.

When I made my written submission, I understood that such information was not available in the UK, but further inquiries indicate that it probably is available in National Grid and could be used to provide much better costing information for the purposes of planning and indication. It could also be used to check whether the recent views that the policy is not very effective in reducing CO_2 emissions are correct. It is vital that more pressure be brought to bear on the Government to carry out studies on that much more realistic basis. It is surprising that a comprehensive audit has not been carried out to tell us what the costs of the policy are and whether it is effective in reducing CO_2 emissions.

12:00

Dr John Constable (Renewable Energy Foundation): I apologise to the committee for supplying further material to add to your reading heaps at short notice. I realise that you have much to read already, but the document that I supplied as supplementary evidence contains a new empirical finding that I believe is extremely important, so I commend it to your attention.

The document, which was published last week, contains the finding that DECC's models of consumer impacts were misrepresented to a significant degree by the headline statement given by the then secretary of state, the Rt Hon Chris Huhne MP, when he said that the net impact of his policies would be to reduce the average bill by 7 per cent or £94. Close analysis of DECC's charts proves that, in fact, DECC expects, based on its optimistic assumptions on energy efficiency and policy costs, that 65 per cent of UK households will have a net increase in bills and only 35 per cent will have a decrease. DECC used the mean of those figures to reduce the headline figure, which I think was misleading. That point deserves close attention and will prove of value to the committee in its deliberations.

Guy Doyle (Mott MacDonald Ltd): I have not provided written evidence, but I will make a couple of comments on the observations so far. I agree that levelised costs do not tell us the whole story and that there are significant additional costs, particularly for renewables such as wind. There are extra transmission costs, balancing costs and reserve costs, but those are all extremely contentious matters on which it is difficult to agree where the numbers come out.

We are unavoidably heading for higher wholesale energy prices, which is the generation component. If we replace the current park of generation, prices will be substantially more than at present. Whether we are going down a plain vanilla gas generation route and paying the carbon penalty, or fitting carbon capture and storage, or whether we are going the nuclear route, or going with renewables, it will cost us substantially more. The questions are about the analysis that DECC has done and to which Dr Constable referred. The 7 per cent reduction in bills is interesting, but it is a very precise estimate of something hugely uncertain, because it is a punt against what will happen to gas prices versus learning about low-carbon technologies.

Andrew Faulk (Consumer Focus Scotland): I thank the committee for inviting us to talk on the subject. I echo some of the previous witnesses'

comments about the uncertainty of cost. The key point is that DECC's projections for energy bills depend on the take-up of energy efficiency measures. We know from our daily work, and I am sure that members will know from their postbags, that energy prices are very much of concern to the public, and that that concern is increasing. The best way to reduce that concern is to take a much stronger approach to energy efficiency.

The Scottish Government has undertaken welcome work on energy efficiency and fuel poverty—it is often better than that of the UK Government—but the scale of resource that is needed on the energy efficiency side of the equation is considerably larger than what is available at the moment. We would like more consideration to be given to the energy policy as a whole. We would like energy generation and energy efficiency to be considered overall.

Duncan Carter (Consumer Focus): I am happy to support Andrew Faulk's statement and not offer further opening remarks in the interests of saving time.

The Convener: Thank you. Members of the committee have a number of questions. I remind members to direct their questions to particular individuals if they can. If a witness wants to respond to a question that is not directed at them, they should catch my eye, but you cannot all answer every question that is asked or we will be here much beyond our allotted time.

Stuart McMillan: My question is for Sir Donald Miller. Your submission talks about the infrastructure and the potential for overinvestment in creating new infrastructure and replacing that which we currently have. Would that not be a positive thing to do because it would mean that futureproofing of the infrastructure could be built in? At the moment, there is an absolute necessity to replace infrastructure so that the opportunities of renewables can be fully harnessed.

Sir Donald Miller: Yes, I agree. I first went into industry in 1944, and I have seen the progressive degeneration of our engineering and manufacturing industries since then. I would certainly love to see some means being developed whereby those industries could be regenerated.

It is, however, extraordinarily difficult to start up such engineering industries in our economy, which is, after all, relatively small. I do not see it happening without Government support. You only have to look at the case of Rolls Royce and the development of the RB211 jet engine, on which the whole of its future depended. When Rolls Royce was privatised, the Government was going to give it a large debt, which would have made it impossible for the company to develop that engine, and we would not have had Rolls Royce around now.

For manufacturing in the UK to return to anything like its previous capability will require some Government support. That can take various forms, such as guaranteed business, for example, which is vital. We have dismantled most of our industry, including our nuclear capability, which was sold off to the Japanese company Toshiba under the previous Government. As much as I would like manufacturing growth to happen, it will be extraordinarily difficult.

Stuart McMillan: My second question is for Dr Constable. In your submission, you mention the expansion of the transmission network,

"the costs of which, realistically, could only be recovered from the larger economic base of England and Wales."

How have smaller European countries, such as Finland, Sweden and Denmark, which do not have as large a population as the UK, managed to provide a transmission network and an infrastructure? You are suggesting that Scotland cannot do that unless we are part of the UK.

Dr Constable: Denmark was fortunate in having a pre-existing richly interconnected system that was set up to provide a transit route for Norwegian and Swedish hydro to the continental mainland. The country was able to use that network in order to balance its wind, and it did not have to build it. That is the simple answer.

A similar answer can be given for Germany, which already possessed interconnections into the union for the co-ordination of transmission of electricity—UCTE—network for other reasons, and has been using that system to balance its wind. Germany has now reached the limits of that pre-existing infrastructure and is faced with the need to expand it further specifically to integrate wind, and those costs are indeed a concern to it.

Stuart McMillan: You are saying that those countries had different Government priorities and introduced different policies that provided that flexibility.

Dr Constable: They have a different history.

Stuart McMillan: Of course, but here in the UK, Government policy has not been as advanced, or as beneficial to the energy sector.

Dr Constable: Those countries are now entering the territory that we are already in. Their policies were not faced with those particular cost challenges—as I said, they have a different history and had a pre-existing infrastructure. Their experience is now becoming comparable to ours, as it were, but their history is not a good example for us.

Mike MacKenzie: My question is for Dr Constable in the first instance. I was fascinated to read in your submission about the Jevons paradox. The Scottish Government energy policy and targets suggest a demand reduction of around 11 per cent, but is it likely, given that paradox and the rebound effect, that we will achieve that?

Dr Constable: One would have to say that it is optimistic, and one should not rely on such reduction to protect the economy and individual consumers—both domestic and industrial—from other policy costs. The rebound effect is real. It is more moderate in domestic cases, although—as I have shown by citing some useful work from Japan—where policies protect consumers from the capital cost of energy efficiency measures, there may be quite a sharp rebound effect.

The rebound effect applies more at the overall economic level. If you improve the efficiency of a process, it is quite likely that that process will be used more. If your efficiency measures are successful, you will see some economic growth, and you are likely to see overall growth in your energy consumption. I am suggesting not that that is desirable but that the empirical data supports that view. The Jevons paradox has been well borne out, although it has been much studied and refined by economists.

The simple answer to your question is that it is clearly optimistic to assume that energy demand could be reduced without a corresponding reduction in economic activity, and in all probability in people's standard of living.

Mike MacKenzie: My next question is for the panel more generally. Do you agree that, when we analyse the cost of energy policy to consumers, there are roughly two components? One is the cost of new energy generation, be it wind power or any other form of renewable generation, and then there is the demand reduction side of the equation, with things such as the carbon emissions reduction target scheme—CERT. Will you give us an assessment of those two components of the cost to consumers in terms of their annual bills?

12:15

Sir Donald Miller: I think that my written evidence comes fairly close to answering some of those points. On page 5 of my submission, I give the extra cost of wind turbines and the subsidy, which adds about 30 per cent in round terms, but as you say, we have to add to that the system costs—that is, the extra transmission costs to transmit the power south and the costs of back-up energy for times when the wind does not blow—and that probably brings us up to the figure that I quote, which is 38 per cent.

According to DECC's figures, which I quote because I have no means of estimating this, carbon trading adds another 10 per cent and the emissions and energy consumer obligations add a further 10 per cent. In total, therefore, we get to 58 per cent.

Mike MacKenzie: Forgive me, Sir Donald, but when I look at the written submissions from some of the other people on the panel, I note that they suggest much lower figures than that. Would any of the other witnesses care to comment?

Duncan Carter: I will talk briefly about how one assesses the capital costs, or the impact of different capital costs on investment. The key thing that we need to create is some industry stability and regulatory certainty. We have seen a lot of changes, and we have seen the impact on the domestic photovoltaics market. In that type of small-scale generation, regulatory uncertainty has impacted on the industry's ability to deliver and has made things less certain. If we can create a regulatory framework that provides certainty, we are likely to see a much lower cost of capital, which should feed through to lower costs for the production of new generating sources, be that wind, gas or conventional power plant.

However, we want to ensure that there is no blank cheque and that there are effective safeguards to ensure that the framework is able to offer consumer protection.

Guy Doyle: I think that the question was about the composition of end-user tariffs. It varies by year, but it is approximately 50 per cent for the wholesale part or the generation part, 40 per cent for wires and about 10 per cent for supply, administration and so on. We are focusing on the generation part. That is the exciting bit because there is talk of a massive renewal, but we are also coming up to significant replacement of the transmission and distribution assets, and also expansion of them to the extent that we need to incorporate some of the new generation.

There is a massive need for renewal or refreshment of the network assets. Also, as you know, we are just about to embark on a smart meter programme, so we will be looking at the customer end, in terms of introducing one of the building blocks of a smart grid. A lot of work is going on at those ends.

Mike MacKenzie's question was also about what can be done on the demand side. I agree with the two chaps on the panel from the consumer side that it is imperative that we try to save energy, because a megawatt saved, or a negawatt as they call it, tends to be quite cost effective. There are massive barriers to getting people to invest in demand reduction.

The rebound effect is interesting. It arises when we do something cost effectively, because we are in effect freeing up income—it is an income effect. We get a rebound effect when we do anything effectively. If we had very cheap nuclear or solar, we would have an income effect from that, too. It is nothing special, and it is better to do energy efficiency effectively than to do it expensively and use lots of capital. It means that we can grow the economy, which has an energy implication. That is something that we just have to bear in mind.

Mike MacKenzie: Demand reduction runs parallel to the other big issue of our time, which is fuel poverty. Many policy instruments seem to be focused on demand reduction and on the amelioration of fuel poverty. Given that those policies are targeted at dealing with both of those problems, will we see the rebound effect to such a great degree in households that are most acutely in fuel poverty?

Dr Constable: I suspect that we might see comfort-taking on quite a significant scale, for example in households that had been unable to heat the whole house, or the parts of the house that they wished to use. If an efficiency measure makes it worth while for them to heat the house, they may end up consuming more energy than they did before. We may see backfire, in fact.

The bigger risk for such households will be shortfall, if the measures do not work as expected—as the models predict—because of difficulties applying the measures effectively to a property that has its own particular characteristics.

One of the other real risks here with regard to these policies is their cost. Mike MacKenzie mentioned the two areas of cost bearing down on the consumer—there are several of course, and we can analyse them in many ways. Sir Donald mentioned the cost of new generation and the system costs. Mike MacKenzie mentioned the cost of CERT and so on. Those policies do indeed have a cost implication for consumers. They are cross-subsidies—they transfer funds from one set of consumers to another. The 65 per cent of consumers in DECC's model who would see an increase in their bills are funding, to a large degree—not totally—the savings of the other 35 per cent.

One of the frustrating things about measures such as CERT, ECO—the energy company obligation—and other similar measures is that their true cost in future is very difficult to understand, largely because the suppliers on which those obligations are placed are not obliged to reveal the full costs of those policies. Their future costs are opaque. That is unsatisfactory, and I hope that elected politicians in London and here in Scotland will focus on that because it needs to be cleared up and made transparent.

There are of course other matters bearing down on the bill. One should not forget that VAT is charged on energy, at 5 per cent for domestic households and 20 per cent for other consumers. That 5 per cent rate, incidentally, is often misunderstood as a subsidy to the energy industry; of course, it is a subsidy to consumers, to reduce their bills.

There is then the EU emissions trading scheme and many other levies, such as the feed-in tariff.

Andrew Faulk: British Gas has published an empirical study on the consumption of some of its customers before and after they installed loft and cavity wall insulation and a new boiler. The study found a significant drop in gas demand. That was among consumers who generally were able to pay and who therefore would have been able to continue spending and take higher levels of heat if they had wanted to. However, that was not what the study found. Therefore, energy efficiency measures have an absolute impact.

We would, however, want people who are living in cold and draughty houses to take some of the comfort. We have absolutely no problem with that.

Duncan Carter: Mike MacKenzie mentioned demand-side response. Energy efficiency is an important component of that, but another aspect is the ability of consumers voluntarily to decide not to use power by participating in some form of active demand response, which should be enabled by the smart metering programme. To receive a financial reward or incentive, a consumer might choose not to turn on their dishwasher or washing machine at a certain time. At present, it is unclear exactly how consumers will benefit. There seem to be lots of sticks but not many carrots, so it would be nice if consumers could participate in the demand-side response, through intermediaries or some other mechanism to support consumer participation.

Mike MacKenzie: Do you agree that, no matter what our energy generation mix, we will inevitably have higher fuel bills in the coming years, at least until renewable technologies become mature, at which point there might be some stabilisation?

Sir Donald Miller: I am not optimistic that renewable technologies will significantly reduce in cost, because wind, wave and tidal are all low-intensity energy sources and are therefore inherently expensive to develop. Obviously, there will be development, but I do not think that it will be anywhere near enough to reduce the costs to that of, say, nuclear power. Dr Mackie was strong on having larger units for economic reasons, and he is absolutely right. A good rule of thumb in the costing of generating plant is that doubling the size of the unit reduces the cost of the energy by 30 per cent. There is a limit to what can be done to

double the size of a wind energy unit. It cannot come anywhere near the 660MW or 1,000MW capacity of a nuclear generating unit. That is why I am not optimistic that there will be significant falls in the cost of developing renewable energy.

Mike MacKenzie: The earlier part of my question was that, surely, whatever technology we choose, there will be cost increases. One of the previous witnesses said that the cost of building new nuclear power stations is uncertain and is now thought to be much greater than was thought only recently. Given those increasing and uncertain costs, if we go down the nuclear route, we will also have much higher energy bills.

Sir Donald Miller: I accept that if we have not done something for a while—we have not built a nuclear plant for a while—there are considerable uncertainties. However, with good engineering, many of the risks can be overcome.

When I was responsible for building Torness, we had not built a nuclear plant for some time, but still had a fairly good nuclear infrastructure in the UK, so we did not start from the weak position that we are starting from now. Nevertheless, by building up a good team, we were able to build Torness to time and cost. I am therefore reasonably optimistic that, in spite of the difficulties, we should be able to turn in a good performance.

12:30

The other aspect is that with the designs that are available now—for example, the Westinghouse pressurised water reactor—there should be less susceptibility to cost uncertainties than there would be in building an advanced gas-cooled reactor such as Torness. There are pluses and minuses but, on the whole, I am reasonably optimistic that if we go about it in a professional way we ought to be able to turn in an acceptable performance.

Mike MacKenzie: Sure—but you are not saying that energy costs for consumers will go down over the next decade or couple of decades.

Sir Donald Miller: The primary reasons for building Hunterston and Torness were economic; they were to reduce the costs of electricity to consumers in Scotland, and that was successful. We were able to set among the lowest tariffs in the UK. That was partly because we were able to export significant quantities of power from our nuclear stations and coal-fired stations such as Longannet. It was often the case that we were exporting 2,000MW down south and making a very useful profit, to the benefit of our consumers.

Mike MacKenzie: Thank you. Would any of the other witnesses care to comment?

Dr Constable: The question is whether we are going to see a monotonic increase in energy costs to consumers in the future. As Mr Atherton correctly said, no one has a clue what will happen to future energy prices. It is conceivable that they will go up, but perhaps they will come down, as they have done in the past. It seemed to President Carter at one time that there was going to be a steady increase, but he was wrong—there was not. That may happen again, so it would be unwise to bet on an increase.

With regard to what would be required in the increase of energy prices to make current renewables look attractive, bearing in mind the current costs of subsidising them, the renewables obligation cost UK consumers £1.5 billion in total in the calendar year 2011 and it cost about £7.3 billion from 2002 to 2011, according to a parliamentary answer from Lord Marland to Lord Vincent. Our estimates suggest that the total renewables obligation cost would have to be in the region of £8 billion a year in 2020 in order to meet the targets. Fossil fuels would have to be very expensive for that to look comparatively attractive.

Mike MacKenzie: Can I just interrupt you? I accept that on occasions costs to consumers go down, but the longer-term trend over a period of years seems to me, as a consumer, to be that prices always go up.

Dr Constable: That may be an illusion of perspective. Energy is very cheap at present by historical standards and it may even become cheaper. The previous panel discussed the gas revolution in the United States, which is real, although its long-term significance is extremely difficult to judge. It is not necessary for a Government or, indeed, anybody outside of a business to take a position on the long-term future price of energy. It will be what it will be, so a Government does not need to take a position on it and it certainly should not bet the national farm on it.

Mike MacKenzie: If what you are saying is true, how do you explain the significant increase in fuel poverty?

Dr Constable: The fuel poverty measure itself is very problematic. You will be aware of Professor Hills's review on that metric. Some people have suggested that the Government is simply massaging the number. It is a strange metric. We must remember that fuel poverty is fundamentally a matter of income—it is an income problem. There is a problem with households that have low income, which fluctuates for various reasons—for example, when the household income does not match increases in energy costs or when people live in energy-inefficient buildings.

The Convener: I will allow other members of the panel to comment.

Guy Doyle: I started off by saying that there is a very high probability that, whatever happens, there will, over a couple of decades, be an increase in energy costs—assuming that we adopt a mixed portfolio of plant. If we take an extremely long view, it is possible that we will see a significant decline in energy costs. If we go far enough back and look at the real-terms cost of wood and various other materials, energy was more expensive in the past.

I would be cautious about highly optimistic assessments of the costs of nuclear power in the near term. In theory, the levelised cost of building a nuclear plant could be lower than that of most renewables but, in practice, building nuclear plants is proving to be very difficult in Finland and France, which are highly competent in that field, although some people may question that.

What was the second part of your question?

Mike MacKenzie: You pretty much answered the important part of it. Thank you.

Duncan Carter: I agree with Guy Doyle. It seems that the trend in wholesale energy prices is certainly upwards. It is important to make the point that that does not necessarily mean that bills will go up, although they are likely to. If you reduce your demand, you may still end up with a lower bill, even if the wholesale price of energy has gone up. Nevertheless, it has been pointed out that there is a real risk that there will be considerably more consumer detriment in the future.

It is important that we are trying to have a low-carbon source of electricity. That is one of the drivers for change and it is why investment is needed. If we decided that we did not want to decarbonise our energy sector, we might well be able to keep costs lower, but that is certainly not the direction of UK Government policy. If we accept that we need to decarbonise, it is inevitable that we will need to invest a good deal more than we have been used to investing.

Patrick Harvie: I will reflect on comments that Dr Constable made on behalf of the Renewable Energy Foundation. I will reflect on some that he has not made.

You sat through the evidence from the first panel and heard the argument that fossil fuel is the only option that we should be pursuing and that we should be entirely unworried about further extraction and use of fossil fuel. During the current evidence, we have heard pro-nuclear arguments. For an organisation that is called the Renewable Energy Foundation, you have said very little to challenge those arguments. You describe your organisation as a

"charity promoting sustainable development for the benefit of the public by means of energy conservation and the use of renewable energy."

Why do you not sound like such a body?

Dr Constable: We take the consumer's perspective. We wish to see renewable energy having a long-term future, rather than being a short-term, subsidy-driven flash in the pan, which I am afraid is what it is at present. If you are going to take people with you on what is a very expensive policy adventure, you have to be transparent about costs and you have to have a plan for containing those costs to consumers. At present, unfortunately—as our work shows—the Government is not being transparent about costs, which are extremely high, and it has no plan for containing those costs in the future.

Furthermore, the Government is making us extremely inflexible. It is betting on the price of conventional energy being very high in the future and is therefore making us unable to take advantage of cheaper energy sources, which may even be renewable. We are getting locked into a high-cost policy option rather than a low-cost option. We do not sound gung-ho about renewable energy because we do not believe that the current policies are, in themselves, economically sustainable. They are unaffordable and they will fail.

Patrick Harvie: It is not just that you do not sound gung-ho. To be honest, you do not sound remotely positive about renewables. Why do you think that you have such a bad reputation in the renewables industry? The chief executive of RenewableUK is quoted as saying that your organisation is

"an anti-wind lobbying organisation."

He went on to say:

"I'd like to know where the renewable energy part of their remit is. They just try to undermine the case for wind energy."

There are similar quotations from the chief executive of Good Energy and the founder of Ecotricity, who says of your organisation that

"They are not a Foundation for Renewable Energy, as their name says ... they actually exist to undermine Renewable Energy."

Why do you think that you have that reputation among people who are building renewables in this country and who are helping to deliver more than a third of Scotland's electricity production?

Dr Constable: It is because those companies are the beneficiaries of the annual £1.5 billion consumer subsidy that is currently being drawn down from bills, and are the anticipated beneficiaries of the £8 billion in subsidy that will be in place from 2020 and thereafter. There is a lot of

money on the table, and it is going to be taken by somebody. We are trying to suggest that that subsidy level is excessive and is not going to produce a sustainable renewables industry.

Patrick Harvie: Would a lower level of subsidy produce more renewable energy?

Dr Constable: That would send a better market signal to the industry. At the moment, you are subsidising existing technologies and frustrating improvements in the sector. Because the subsidy is so high, those people are protected from the tempering fires of market competition.

Patrick Harvie: In the previous question-and-answer session, to which you listened from the gallery, we heard the argument that pretty much any energy choice that we would want to make requires subsidy and policy consistency. If we want renewable energy, which the name of your organisation suggests you want, we need subsidy and policy consistency.

Dr Constable: I do not agree that we need subsidy in order to have a mixed portfolio in the future.

Patrick Harvie: You think that we will achieve a big expansion in renewable energy generation if we have no subsidy for renewables.

Dr Constable: If you are confident, as some of you seem to be, that there is going to be a monotonic increase in energy prices, you will see a spontaneous uptake of renewables, which will be cost effective, and you will see a lot of innovation in the sector.

I believe that it was Dr Mackie who said that all energy choices would require subsidy. At present, the market is so distorted that countersubsidies are being introduced in order to motivate investment in conventional technologies that would be spontaneously viable without subsidy, if not for the fact that there are intensive market distortions in favour of renewables elsewhere. That is what electricity market reform is really all about.

Patrick Harvie: Just to be clear about your position, I have before me an interview with you, for which I do not have a reference. Perhaps you could confirm whether this is an accurate reflection of your views.

Dr Constable: I do a lot of interviews. I will try to remember which one it was.

Patrick Harvie: This one says:

"Constable admitted there is not one of the UK's 800 built, consented or planned onshore wind farms that the group would support"

and says that you

"dismissed the proposed Round 3 offshore wind farm developments as a 'fantasy'".

Is that an accurate reflection of your organisation's views? Do you not support any onshore wind developments?

Dr Constable: I have yet to see an onshore wind generation project whose benefit clearly outweighed the disbenefit to local people. That is a planning point. Remember—those are all low load-factor plants. Offshore wind has a higher load factor, but the costs are high, too. There is a reasonable case for experimenting with offshore wind—because it is genuinely windy offshore—but the developments are expensive, and we should be proceeding with extreme caution.

I do not remember that particular interview, by the way, but I stand by those remarks.

Patrick Harvie: You answered my previous question by calling for transparency from the Government about some of the figures. Would you be transparent about your organisation's funding and interests?

Dr Constable: They are no secret.

Patrick Harvie: The various bits of information that are available online—again, I do not know whether these are sourced accurately, so you could perhaps confirm or deny them—suggest that many of your trustees, officers and the officers of the various subsidiary companies, have interests in the oil industry, fossil fuel industries and some of the most destructive industrial-scale biomass industries as well. Can you confirm or deny whether your officers have such interests?

Dr Constable: They do not, as far as I know, have such interests in biomass. I saw a report saying that one of our trustees is a man called Colin Davis who is secretary of the Aluminium Federation. That trustee is, in fact, a man called Colin Davie, who is a Lincolnshire county councillor. There are other similar misapprehensions and misinformation about our trustees. Carol Bell is an energy expert and had interests in gas, as it happens, but she is simply an energy expert.

Patrick Harvie: Is Guy de Selliers still the chairman?

Dr Constable: Guy de Selliers is a prominent European banker who has interests in many other businesses.

Patrick Harvie: Do those interests include industrial-scale biomass sugar cane production?

Dr Constable: Guy de Selliers is involved in Solvay. I do not know what Solvay's interests are, but he has never, that I know of, mentioned an interest in sugar cane for biomass.

Patrick Harvie: He has not, that you know of. Does he have no fossil fuel interests, either?

Dr Constable: I would be very surprised if his businesses, which he administers through the bank, do not have such interests. A banker is bound to touch on investments in a very wide range of activities.

12:45

Patrick Harvie: Yes, but not specifically renewables.

The Convener: We need to move on.

Patrick Harvie: I have one final question, which is simply about some of Dr Constable's written evidence.

You mentioned intermittency and the need for fossil fuel back-up for renewables. Duncan Burt of National Grid told us that, although intermittency is an issue and a challenge, it is just a different type of challenge that is not fundamentally harder than the challenge of managing the grid with the current mix. He said, for example, that when a nuclear power station goes off, it goes off very suddenly, and that balancing wind is simply a different type of manageable problem. He also stated that

"Wind does reduce the carbon intensity of the grid"

and that

"every megawatt that is generated from wind"

is considered as

"avoiding the need to generate a megawatt from an alternative source"

such as

"coal and gas"—[*Official Report*, *Economy, Energy and Tourism Committee*, 23 May 2012; c1543.]

Why is your position on those issues so different from that of someone who manages National Grid and should be ideologically neutral about where the electrons come from?

Dr Constable: My position on that is not different; I suspect that he and I agree about it completely. National Grid is quite correct to say that it is simply an engineering problem, but that problem comes with a cost that is very difficult to calculate, as Mr Doyle has already noted.

I refer you to Mr Gibson's work, to which Sir Donald Miller has already referred, which indicates the system integration costs across various timescales and including various other matters. We summarise those in several of our publications.

Patrick Harvie: I presume that you regard those costs as being necessary, as you are an organisation that is interested in promoting renewable energy.

Dr Constable: You have to keep costs down to keep consumers with you. The kind of premium that we are looking at in 2020 will be in excess of £10 billion a year, which is getting on for 1 per cent of the United Kingdom GDP. That is insupportable.

Patrick Harvie: It just sounds as though, if we were to implement the policies that you are suggesting, we would see an end to renewable energy investment.

Dr Constable: You would not see enough renewable energy to meet the current targets—

Patrick Harvie: Thank you.

Dr Constable: —but the current targets are arbitrary and have no significance in relation to our energy needs, because they are relatively modest, despite being expensive.

Patrick Harvie: I think that you answered the question that I was interested in. Thank you.

The Convener: Sir Donald Miller wants to come in on intermittency.

Sir Donald Miller: To answer Mr Harvie's question in part, I note that the previous witness, Dr Mackie, held up a graph that showed the wind output from his three turbines and said that every megawatt that is generated results in an equivalent reduction in CO_2 emissions from fossil fuel plant. No engineer who has had anything to do with a power system or operating a power plant would believe that for one minute. We all know that if you cycle fossil fuel plant—as you must do, because of the intermittency of wind—the efficiency goes down, just as when you drive your car through Edinburgh, you do not get the number of miles per gallon that you get on the M9.

A good deal of information is now beginning to emerge on that effect. For example, if you run a coal-fired plant down to 80 per cent output and then push it up again within an hour, which is the sort of thing that you might have to do, that coal plant will typically use more coal than if it was running continuously at full output for the hour.

There are serious doubts about the effectiveness of renewables, given that we have to cope with that intermittency problem. That is why I make a plea for the committee to put its weight behind some proper studies to be carried out by independent agencies—for example, the Royal Academy of Engineering. It is now crucial that we find out whether there is anything in that, and how much of a reduction in CO_2 levels we are getting for our investment.

Angus MacDonald: I am conscious of the time so I will keep this as brief as I can. To return to the fuel poverty theme, the panel will be aware that the UK draft energy bill, which was published last week, mentions the green deal, which is a new approach to energy efficiency financing. How much of an impact will the green deal have on fuel poverty? Have any calculations been done to estimate the extra amount that would be released for spending in the marketplace if there was more of a focus on tackling fuel poverty? I direct that question to the CFS representatives.

Andrew Faulk: On the impact of the green deal on fuel poverty, it is important to say that it is designed for able-to-pay consumers, and that it is accompanied by the energy company obligation. As has already been mentioned, the energy company obligation is a successor to the current energy efficiency programme. We have made clear suggestions in consultation responses about how best to direct the energy company obligation so that it has the maximum impact on fuel poverty.

One aspect of that is that we should not completely cut off the standard low-cost measures such as cavity wall insulation as we build up the longer-term measures that we need to take—particularly for rural off-gas-grid Scotland—in renewable heat and solid wall insulation.

The scale of the impact on fuel poverty will be determined by the amount of money that goes into energy efficiency financing. We are a founder member of the campaign to reuse the EU emission trading scheme money, which will go to the Treasury, and put it towards energy efficiency. If we do that, we will have a much more significant impact in relation to reducing fuel poverty.

As it stands, I expect the green deal to have some impact, but the scale of that impact is very much open to debate because it depends on how the commercial model stacks up and how attractive it is to consumers.

Duncan Carter: Early indications are that there could well be a drop in the number of cavity wall insulations under the green deal, in comparison with current measures, because vulnerable consumers can get cavity wall insulation at low or no cost at the moment, but will be required to pay for it under the green deal. That could be a negative impact. Cavity wall insulation is a cost-effective way of improving comfort levels in people's homes and lowering their energy bills.

Angus MacDonald: One of the most frustrating things for elected members is the lack of transparency around the way in which the energy companies tackle fuel poverty. I am sure that you would agree that that should also be looked at.

Dr Constable: I have an empirical point. With regard to the impact of the green deal and its distribution to fuel-poor households, the committee might wish to consider requesting information from the Scottish Government and DECC in London. I refer you to figure 3, which is a chart from DECC, in the supplementary evidence that I have provided. Households with lower expenditure are expected to save more under the policies, and the red line in the chart represents households that receive at least one measure. However, the figure is not broken down so we cannot tell how many households are expected to receive the green deal or an ECO, for example. To construct that red line, DECC must have some model of the distribution numbers; perhaps the Scottish Government also has it. The committee might want to ask for that, to see what kind of answer you get.

Angus MacDonald: That is a fair comment.

Rhoda Grant: I have a short question about fuel poverty. I have heard what CFS has said about the green deal. Our report will go to the Scottish Government. What else can we do at the Scottish level to tackle fuel poverty? What is missing from our measures?

Andrew Faulk: Fundamentally, there is a need to get an awful lot more money into energy efficiency. The campaign to reuse the EU emission trading scheme money would, if successful, lead to a significant boost in the budget; after all, that money goes on to consumers' bills anyway and other countries, including Germany and Austria, reuse it, at least in part, for energy efficiency.

There is already a great deal of good practice in the way in which the Scottish Government delivers energy efficiency programmes. For example, the universal home insulation scheme is much more effective when carried out on an area basis and in conjunction with communities than it is when we try to identify individual and often quite difficult-to-reach consumers. The Scottish fuel poverty forum and others have suggested a greater balance of resource for area-based energy efficiency schemes that work with existing structures, and an increase in the money available. We should also ensure that the green deal is as effective and friendly as possible in a Scottish context, which means ensuring that it works in rural Scotland, in Victorian tenements in urban Scotland and in all the house types in between.

Duncan Carter: There is a very close correlation between fuel poverty and not being connected to the gas grid. That is a particular problem in remote Scottish locations, because it will probably never be economic to connect them to the grid. As a result, we need to start thinking about how we heat people's homes comfortably and affordably. There might be some comfort in DECC's renewable heat strategy; it is very much at an early stage, but it might in time provide some

funding to help households that are not connected to the gas grid heat their homes more cost effectively. Obviously, that will have to happen in conjunction with energy efficiency.

Andrew Faulk: Given that we were not really prepared to answer such questions, we are very happy to provide the committee with supplementary evidence on the matter.

The Convener: That will be helpful.

We are up against the clock and unless any members have a desperate final question—

John Wilson: I have a desperate final question about nuclear power for Dr Constable and Sir Donald Miller. In his written submission, Dr Constable talks about a balanced approach to energy. We heard this morning that it could cost £7 billion to build new nuclear power stations, and it is my understanding that the costs to the UK Government of decommissioning are about £3 billion a year. What is nuclear power's future in the UK, and in Scotland in particular?

Sir Donald Miller: I have to go back in history to the time I retired, which was about 20 years ago. Shortly before that, Scotland was 60 per cent nuclear; after we decommissioned Hunterston A, it was about 50 per cent. Bearing in mind the resources required to achieve a balance over a period of years and the risks and benefits involved in stabilising electricity prices, I would have thought that a reasonable, sensible balance for the UK as a whole would be between 40 and 50 per cent.

A lot has been said about the costs of decommissioning, but perhaps a bit of historical context might be useful. As you know, the cost of building nuclear power stations is very high; however, the cost per unit to the customer of running them, of fuel and of other works such as decommissioning and waste disposal is very low. When we were running the nuclear plant before privatisation—

John Wilson: Who picks up the cost of insurance for nuclear power plants?

Sir Donald Miller: We were required to carry the first £50 million of insurance, and we were insured with a consortium of companies across Europe. I believe that the figure is now £100 million, with the Government carrying the rest. We found that the consortium was charging very high premiums, despite the fact that we had made not one claim. In order to reduce costs we set up our own in-house insurance company, which allowed us to lay off the costs with a lot of pension funds. Indeed, that insurance subsidiary became a very good business in its own right. I think that the situation today is the same.

13:00

You must remember that in the design of nuclear plants you are aiming at a 1 in 10 million chance in any year of exceeding the permitted dose at the boundary fence. That is very low; in fact, given the risks that we face in everyday life, it is negligible. Nevertheless, no private insurance company has the resources to meet the potential risk, which is why one must have that contingent liability with the Government for above £100 million.

However, I do not believe that such an event will ever happen in this country. I know that people cite Chernobyl; when we saw the prototype of Chernobyl in Russia, we knew that it was dangerous. Indeed, we prepared a report that we took back to and discussed with the Russians, but they did nothing about it. There is absolutely no reason to think that that will happen here or anywhere in Europe.

Dr Constable: I will be very brief, convener. On the question whether nuclear has a future with regard to investment, my understanding is that, in the current distorted situation, nothing, not even a combined cycle gas turbine, is investable. Consequently, I cannot see anyone wishing to invest in nuclear energy. The markets are extremely distorted and investors are waiting for compensating distortions to be introduced through the electricity market reform package. Of course, they are very concerned that, as Mr Atherton suggested, the cost of those compensating distortions will be unacceptable to the consumer. As a result, many of them are either looking for low-cost capital plant, which might bring them a very rapid return on investment, or simply sitting on their hands, preparing consents and waiting for distressed policy correction.

The Convener: I thank the witnesses for their attendance and their very helpful contributions.

Meeting closed at 13:01.

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