The Scottish Parliament
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Official Report

ECONOMY, ENERGY AND TOURISM COMMITTEE

Wednesday 9 December 2015

Session 4

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CONTENTS

ECONOMY, ENERGY AND TOURISM COMMITTEE
32nd Meeting 2015, Session 4

CONVENER

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

DEPUTY CONVENER

*Dennis Robertson (Aberdeenshire West) (SNP)

COMMITTEE MEMBERS

*Chic Brodie (South Scotland) (SNP)
*Patrick Harvie (Glasgow) (Green)
*Johann Lamont (Glasgow Pollok) (Lab)
*Richard Lyle (Central Scotland) (SNP)
*Gordon MacDonald (Edinburgh Pentlands) (SNP)
*Lewis Macdonald (North East Scotland) (Lab)
*Joan McAlpine (South Scotland) (SNP)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Professor Keith Bell (University of Strathclyde and UK Energy Research Centre)
John Forster (Solar Trade Association Scotland)
Tony Mackay (Mackay Consultants)
Joan MacNaughton
Angus McCrone (Bloomberg New Energy Finance)
Niall Stuart (Scottish Renewables)
Felix Wight (Community Energy Scotland)
Dr Mark Winskel (University of Edinburgh and UK Energy Research Centre)

CLERK TO THE COMMITTEE

Douglas Wands

LOCATION

The James Clerk Maxwell Room (CR4)

Scottish Parliament

Economy, Energy and Tourism Committee

Wednesday 9 December 2015

[The Convener opened the meeting at 10:04]

Decisions on Taking Business in Private

The Convener (Murdo Fraser): Good morning, ladies and gentlemen, and welcome to the 32nd meeting in 2015 of the Economy, Energy and Tourism Committee. I welcome members, witnesses, who I will come to in a second, and our guests in the public gallery. I remind everyone please to turn off or at least turn to silent mobile phones and other electronic devices, so that they do not interfere with the sound equipment. We have received apologies from Patrick Harvie, who is running late, but he should be with us shortly. One of our witnesses, Felix Wight, is also running late but should be with us shortly, too.

Under agenda item 1, are members content to take in private item 4, which is a discussion of our work programme?

Members *indicated agreement.*

The Convener: Under item 2, are members content that we consider our draft report on the future prospects for oil and gas in Scotland in private at future meetings?

Members *indicated agreement.*

Renewable Energy

10:05

The Convener: Under item 3, we will take evidence on the future of renewable energy in Scotland. Before we begin, it would be helpful if we went round the table and said who we are and why we are here.

I am Murdo Fraser, the convener of the committee, and I am a Conservative MSP for Mid-Scotland and Fife.

Dennis Robertson (Aberdeenshire West) (SNP): I am the deputy convener of the committee and I am the Scottish National Party member for Aberdeenshire West.

Niall Stuart (Scottish Renewables): I am the chief executive of Scottish Renewables, which is the representative voice for the sector in Scotland.

Chic Brodie (South Scotland) (SNP): I am a regional list member of the Scottish Parliament for South Scotland.

John Forster (Solar Trade Association Scotland): I am chair of the Solar Trade Association Scotland, and I am on the board of the STA for the United Kingdom. I also own Forster Group, which is a range of businesses, one of which is a large solar installer in Scotland.

Gordon MacDonald (Edinburgh Pentlands) (SNP): I am the MSP for Edinburgh Pentlands.

Dr Mark Winskel (University of Edinburgh and UK Energy Research Centre): I am a research fellow in energy innovation at the University of Edinburgh. I also work for the UK Energy Research Centre.

Richard Lyle (Central Scotland) (SNP): I am an MSP for the Central Scotland region.

Professor Keith Bell (University of Strathclyde and UK Energy Research Centre): I am from the University of Strathclyde, where I occupy the Scottish Power chair in smart grids. Like Mark Winskel, I am involved in the UK Energy Research Centre.

Lewis Macdonald (North East Scotland) (Lab): I am a Labour MSP for North East Scotland.

Tony Mackay (Mackay Consultants): I am an energy economist based in Inverness.

Johann Lamont (Glasgow Pollok) (Lab): I am the Labour and Co-operative member for Glasgow Pollok.

Joan MacNaughton: I chair some work for the World Energy Council on the energy trilemma and

I am on various other academic boards dealing with energy and climate policy.

Joan McAlpine (South Scotland) (SNP): I am an MSP for the South Scotland region.

Angus McCrone (Bloomberg New Energy Finance): I am the chief editor of Bloomberg New Energy Finance. We are a business of about 200 people who crunch all the numbers and analyse in some depth the trends in clean energy and the energy transition worldwide.

The Convener: We are also joined by the official reporters, who are noting down everything that we say, Alasdair Reid, who is a senior researcher on energy policy in the Scottish Parliament information centre, and our committee clerks, who are here to keep me right. I welcome Felix Wight from Community Energy Scotland, who has just joined us.

We are going to run the discussion in a round-table format. It will run for about 90 minutes or so and we will try to finish by about 11.30, as the committee has other business to discuss. I want to keep the discussion as free-flowing as possible. I urge everyone to make their points as briefly as they can, as that would be helpful. If people want to contribute, just catch my eye and I will bring you in as best I can and as time allows. If you agree vehemently and particularly if you disagree vehemently with a point that has just been made, it would be useful if you catch my eye and I will bring you in and allow you to contribute. That way, we will get through the topics in the time available.

I will start by setting the scene a bit as to why we are here. As we know, there was a change in the UK Government last May. We now have a Conservative Government that was elected with a manifesto pledge to end subsidies for new onshore wind projects. The renewables obligation will close from April 2016, but with grace periods in place, which the witnesses might have views on. There is a current consultation on controlling subsidies for solar photovoltaic and on the feed-in tariff, which witnesses might have views on. In the last month, we had a speech from Amber Rudd, the Secretary of State for Energy and Climate Change, which was billed as a reset speech to set out the direction of UK Government policy. There has been a lot of discussion on that, with a focus on offshore wind. There have been discussions on the future of marine energy, and I noticed that Mr Mackay's written submission commented on that, so that might be of interest.

We are also interested in talking about not only renewable electricity but renewable heat, on which there have been some Treasury announcements. According to the latest edition of Scottish Energy News, the Treasury expects that its managed expenditure on environmental levies—including renewables obligations, contracts for difference and feed-in tariffs—will more than double, from £6.2 billion in 2015-16 to £13.8 billion in 2020-21. The Treasury is, as we know, concerned about overall costs in the sector.

On top of all that, the Scottish Government's budget is due out a week today, so you might have a view on that. We have Scottish Parliament elections in May next year, which might have an impact. There are a lot of things happening and a lot of moving parts in the equation.

I thought that it might be useful to start by going round the witnesses, beginning with Niall Stuart. I ask you to set the scene for a couple of minutes. Tell us where you think the sector is and what the major challenges are, and what you are looking for going forward. If you try to do so succinctly, that would be helpful.

Niall Stuart: I echo some of the points that we made in our written evidence. The past decade has been a success in terms of the significant growth of renewables: particularly renewable power but also renewable heat and transport, although we are behind the target in those two areas.

That growth has been down to supportive policies at Holyrood and Westminster. However, the cuts to various schemes—to which the convener referred—along with closures to support schemes and delays in the timescale for the next allocation process for contracts for difference mean that, in many ways, the sector is in disarray at present. All those sudden changes have not been good for the people and companies who work in the sector, and people are leaving the sector. The changes have not been good for companies and communities that want to invest in new projects.

I will highlight two aspects of the tragedy that all that represents. One is that, to some extent, it stalls the momentum that the sector has made over the past decade. For example, there have been pretty significant reductions in cost in onshore and offshore wind and in solar, but the very sudden changes threaten progress in that respect.

The most important point is that those sudden changes and their impact on the sector run counter in many ways to the UK Government's overall ambitions on climate change and its oft-stated commitment to decarbonising the energy sector and the economy at the lowest cost to the consumer. Actions such as removing all support for onshore wind and solar very much run counter to that aim, given that those are the lowest-cost forms of not just renewables but low-carbon power that we can deploy at scale.

Those are the problems. In future, we need to get the industry looking forward again rather than looking back. We need some sense of ambition from the UK Government and the Scottish Government for the role of renewables in meeting the key overall challenge of decarbonising the energy sector and the economy, not just out to 2020—our 2020 targets have been the focus until now—but beyond 2020 to 2030 and potentially even 2050. Right now, the industry is, to a greater or lesser extent, feeling its way in the dark in terms of the overall ambitions for the sector.

John Forster: Naturally, I will speak on solar. First, I congratulate the Scottish Government's commitment to the 2020 target of 100 per cent renewables, which is very good. Since we set up the STA Scotland back in March—albeit that the STA has been around in the UK since 1978—the support from the relevant teams in the Scottish Government has been very good.

However, the reality is that solar technology in particular is underdeployed in Scotland. We are heading rapidly towards 9GW of solar in the UK, and it would therefore be logical to think that we should be approaching 900MW of solar in Scotland. We will be lucky if we are getting past 200MW by the end of this year, so we are a long way off the mark.

10:15

On the other hand, there is a huge amount of wind deployment, which has been incredibly successful. The trouble with that is that, if we are looking for renewables to provide a long-term solution to our overall power needs, we have to deal with intermittency. It is now well proven that wind and solar power work well together, but if we have more than 5GW of wind, by rights we should have around 2.5GW of solar by now if we are to achieve some sort of balance. With that combined with storage, we would be producing something akin to base-load. That is an important difference to understand.

As Niall Stuart has mentioned, solar and wind are the two lowest-cost technologies. In reality, solar technology will be the first subsidy-free technology. The Solar Trade Association reckons that that will be around 2019 or 2020, but it may come sooner, depending on the actions of the industry on the back of the cuts. However, without any doubt, solar will be the first subsidy-free technology.

Solar technology is also closer to the consumer and the end user, which is important for things such as fuel poverty and cost reduction. It is important to say that this is not just about generation numbers, although ultimately the target of 100 per cent electricity generated by renewables is all about the top level and how many gigawatts we have. However, we have to bring things down to a user level. Whether the issue is fuel poverty, which is a major issue and in respect of which there is a major opportunity for solar power in Scotland, or cost reduction in industry, where solar power can play a huge role, the potential is enormous.

Solar technology links well with other technological solutions, such as storage, which we will hear about. How energy is used and consumed and the move to more electrically based transport work well with our more electrically based economy. Obviously, solar power fits well into that at a user level. Solar power also has great local and long-term employment opportunities as opposed to the short-term employment opportunities that tend to go with some of the larger hits from deployments.

Solar technology has the potential to move from the carrot scenario, in which big subsidies have supported big deployments, to the post-subsidy, low-subsidy or subsidy-free scenario in which it will pay for itself. We see a massive uptake of solar technology over the next few years on the back of the new October 2015 building standards, as solar PV is the best, cheapest and most accessible solution for the new-build industry in Scotland. That does not bring big numbers. We reckon that, by 2020, the number will probably be around 72MW of deployment per annum on around 24,000 new homes, assuming that we can achieve the targets that have been quoted. However, there is huge potential. Scottish commercial rooftop potential could deliver the entire remaining balance of the 50 per cent of electricity that we are trying to get from renewables. That is how significant the opportunity is. That is at a consumer level, which is in itself phenomenal.

If we look at what we have done to date, with the heavy weighting towards wind and the missed opportunity for solar, we see that it is probably time for a strategy rethink. I do not necessarily blame any one party for that; there are many players. It is about getting the deployment mix right and bridging the gap.

Is there an opportunity for a Scottish feed-in tariff and renewables obligation? The costs of getting solar to be subsidy free are tiny in comparison with those of other solutions, let alone when we talk about the nuclear option. We really start getting down to marginal income and marginal cost, a little financial support or a little cost reduction. Grid connection or planning costs could be reduced, for example. Those are the little things that will bring about parity or the subsidy-free solar opportunity sooner rather than later. Solar therefore has a big part to play.

The Convener: Thank you. You slightly stretched my definition of two minutes, but I will forgive you for that for now.

Dr Winskel: I agree with Niall Stuart's comment. In many ways, the past 20 years has been a success story. There has been broad political consensus at the United Kingdom level, which has been very important, and we have seen very significant changes to the energy system during that period. We have had a considerable renewables expansion, significant falls in energy demand, some of it policy driven, and the significant decarbonisation of energy supply.

I have looked for signs of continued commitment to that. Amber Rudd declared in her speech that the Climate Change Act 2008 was a good model; she also suggested that the carbon price would need to escalate. There is still political consensus at UK level that low-carbon transition is necessary and that we need to pursue it using the least-cost method. However, there are obviously a lot of concerns—there is a whole list—about practice and what we have seen in specific areas since May. I do not know how far into those issues we want to get but, alongside the renewables question, the issue of carbon capture and storage and the withdrawal of £1 billion of demonstration project support funding has huge implications for the system transition as articulated by the Scottish Government's report on proposals and policies 2, for example, and the fourth and fifth carbon budgets.

The UK Government's whole statement is the need for a hard reset, which would mean quite major changes to the policy regime. The evidence does not necessarily suggest that that hard reset is absolutely necessary. We have seen quite significant benefits from the introduction of the electricity market reform, and contracts for difference are proving to be an important mechanism for cost reduction in offshore and onshore wind. We have had one round. We know that policy takes time to bed in, and the investment community and everyone else associated with the industry need a big period of learning around all policy measures.

We must also address the extent to which gas is seen as the preferred technology for investment in the 2020s. The Department of Energy and Climate Change's revised energy projections to 2035 have a significant amount of extra gas built into the level deployed—an extra 12GW on the system by 2035 compared with last year's projections. That suggests that we are heading towards a much more gas-based system. That might be compatible with decarbonisation up to about 2030. After that and beyond, there are serious questions about what gas will do to the emissions intensity on the electricity system.

Those are some of the problems being created at the moment that will manifest in the longer term. Obviously, there are shorter-term implications for meeting the renewable energy directive target given that there is little prospect of support for more onshore wind. There are concerns now about the delivery of policy targets specifically to 2020, although problems are being stored up for after 2030.

Professor Bell: There is a danger of an outbreak of agreement, at least on this half of the table. I would also say that the deployment of renewables has been very successful and it still has a huge role to play. John Forster is quite right to highlight the huge reduction in cost of solar photovoltaic. We have seen issues down south about how that is being used and whether the system issues are quite being managed as they arguably should be managed.

We must recognise the success of renewables and the reduction in cost not just of solar PV but of onshore and offshore wind has partly been facilitated by the financial support that has been given to them. It is quite right that—this is an issue on which I would agree with the UK Government—we should be seeing the costs continue to come down and that we should be encouraging that. However, looking retrospectively, we must accept that the cost reductions so far have been partly because of the support that has been given. Could we turn back the clock and optimise that level of support? That is just not possible; what has happened has happened.

The first rounds of the contracts for difference auctions look as though they are doing the right things in bringing about further cost reductions, but we still need to see how much of that capacity will be delivered. As Niall Stuart, John Forster and Mark Winskel have alluded to, quite what happens next, when the next rounds will be and what will be contracted for are big open questions.

Mark Winskel has already mentioned the big challenges that are to come after 2020. A lot of attention on whether we will meet the 2020 target has already been articulated, but decarbonisation of heat is a massive issue that we need to take seriously. What John Forster has said about the buildings stock, improvements and new standards is extremely important. The existing stock is still a challenge.

The extent to which we decarbonise heat by electrifying it and using a decarbonised electricity system as opposed to other options is still to be resolved, as is the most cost-effective way of doing that. Other options might open up, such as combined heat and power—as long as you are using renewable sources of power—district heating, and so on. They all have massive capital expenditure implications.

John Forster mentioned the operability of the system, which is absolutely right. There are ways of doing it but, as an engineer, I have to say that it might cost you. We need to ensure that we minimise that cost. The electricity supply industry has been a bit slow in getting around to it, but positive moves and serious attempts to address the issues have been made.

Storage has a big part to play. We should not forget that we have already made massive use of storage. Coal stocks are a form of energy store, as are gas stores. We have made use of those stores for electricity at the right time and in the right way, for the past 50 to 60 years. As we quite rightly decarbonise, we will lose the coal stocks and, as Mark Winskel said, going into the 2030s, we ought to be losing the ability to call on gas, except in a small way or perhaps in alliance with CCS. We are then left with thermal storage, which remains cheap in comparison with batteries but we are not doing our best with it so far.

Tony Mackay: Some members of the committee will know that I have had long-running arguments and disagreements with the Scottish Government about its energy policy, including regular arguments with my local MSP, who happens to be the minister.

Electricity accounts for less than 20 per cent of energy consumption in Scotland. It is a relatively small producer of CO_2 and other emissions. Oil, particularly that which is used in road transport, is the biggest polluter, and gas, which is mainly used for domestic heating and cooking, is the second biggest. I cannot understand the Scottish Government's obsession with electricity because we should be doing much more to reduce pollution, particularly with road transport, such as using electric vehicles or those that use alternative fuels to diesel. The same is true with houses. We can make much bigger contributions to environmental policies and cutting CO_2 emissions by concentrating on road transport and, to a lesser extent, housing.

I make my second point as an economist. The subsidies for onshore wind have been far too high. Work that I have done recently on profit shows that the rate of return in onshore wind farms in Scotland is currently about 22 per cent. The industry average rate of return is about 10 per cent and most of the energy utility companies such as Scottish Power and SSE are happy to get 5 per cent or 6 per cent rate of return. The subsidies might have been justified in the early days but they have been far too high for the past few years. From an economic point of view, it is sensible to cut them radically, although they should not necessarily be eliminated.

I mentioned my third point in my written submission. A lot of the research and development that Scottish Enterprise and Highlands and Islands Enterprise have put into the renewable energy industry, particularly for wave energy, has been badly used or misused. Pelamis and Aquamarine Power have gone out of business. Scottish Enterprise lost about £20 million on those two companies, and HIE lost about £15 million. It is difficult to say how, but I think that we could make much better use of the public sector money that we are putting into renewable energy.

10:30

Joan MacNaughton: Well, convener, you encouraged us to engage in violent disagreement, so I would like to say that decarbonisation of the electricity sector is crucial if we are going to succeed in improving the carbon emission performance of transport and heat over the longer term. We do not have to do it with electricity, but electricity will probably end up being the right way to go over the longer term.

I will make two points on that. The first, which has already been partly alluded to by colleagues, concerns the question of where we are going after 2020. We need the vision—not just the vision in terms of the overall carbon budget but the road map that tells us how we are going to get there. Essentially, we are replacing a huge legacy capital stock that has been built up over 100 years or more. In order to do that in a way that is as affordable as possible, we need to know where we are going to end up and how we are going to do it. That does not imply Government prescription of everything, but it implies some principles and a view of where the cost attribution will fall in the future. That is highly relevant to judgments around which particular technologies are going to reach grid parity when. It would be wrong to address system impacts by loading a lot of up-front costs on to the early movers in the renewables sector, which I think is being considered down south. However, equally, it would be wrong not to take account of the whole-system costs of renewables. That will be an extremely important area in future, but it is not receiving a lot of attention at the moment.

In the work that I lead for the World Energy Council, the relative affordability ranking of the United Kingdom has deteriorated significantly over the past three years, and that is largely down to renewable support schemes. That does not mean that we should not engage in support for renewables; it means that we did not get the shape of those support schemes right, and it means that we must be careful in our decisions for the future that we decarbonise in the most affordable way. I agree with a lot of the comments that have been made around that, but I would make one more, which is implied by the prospect

of a new dash for gas. If the current complete reduction in investment in the oil and gas sector upstream results in a bounce back of oil and gas prices at some point—which seems likely, given that we expect shale gas production to peak in the US in the mid-2020s, according to the International Energy Agency—the situation in which we have made ourselves too dependent on gas will mean that we are not optimising the affordability of the system. A strong and healthy renewables sector is going to be a valuable hedge against global wholesale movements in gas. I would encourage us to explore in rather more detail than I can in this brief introduction the system implications of the crossovers with the gas strategy and how we execute the policy in a way that delivers what we are trying to deliver, which is security of supply at the most affordable cost, while decarbonising the electricity sector and, indeed, our energy sector generally.

Felix Wight (Community Energy Scotland): I thank the committee and the convener for your generous offer of two minutes in which to make our opening statements. I wish that we had the same generosity around the amount of time that we have in which to achieve our carbon ambitions, but we do not.

I am here today to focus on issues relating to the community energy sector in Scotland, which reflects the interests of my organisation's members, and the impacts of the reset of Britain's energy policy that has been announced in Westminster.

Scotland continues to lead in community energy in the UK. About a third of the installed capacity in the UK is in the Western Isles. That reflects the scale of ambition of Scottish communities, the opportunities that have been available and the structural support from the Scottish Government, which is what has made the underlying support mechanism that is available in the UK play out differently in Scotland. It is important that the leadership and support continue.

The question that we really face is, what next? The 500MW target for locally and community owned energy has sent an important signal, but we are now, in effect, meeting that target and we would like to see a clear signal of continued ambition in Scotland. However, the challenges that have been touched on by those who have spoken before me—the more drastic than expected changes to the renewables obligation, the feed-in tariff and the climate change levy, as well as the enterprise investment scheme—mean that just doing what we have done before will not be enough.

As Tony Mackay said, we need to think about the integration of electricity generation with the wider energy system, particularly transport and heat. Community Energy Scotland's view is that a greater focus on innovation and experimentation at the local level is one way in which we can try to create a more integrated energy system through things such as storage, local energy supply models and demand-side management. Those things are already happening in Scotland and are being supported, but they need to become a greater part of the main stream.

At this stage, we need to redouble our efforts and build on what has been done so far, making sure that all the capacity, learning and skills that we have in Scotland are not lost. We must work together to ensure that, in the next phase, the success that we have had to date, in terms of the significant amount of renewable energy that has been installed so far, becomes much more about local ownership, control and participation in Scotland's renewable energy resources. It is a question of not just adding more numbers to the system but ensuring that renewables are the low-cost, profitable option for ordinary people. When we have more time, I will be happy to give more detail about some mechanisms for achieving that as well as about the impact of the UK's subsidy cuts.

Angus McCrone: I will start with a bit of international flavour. By a considerable margin, 2015 will be a record year for investment worldwide in both solar and wind installation in terms of gigawatts. It is also likely to be the first time that developing countries have invested more than developed economies in renewable energy, excluding large hydro schemes. That is really quite exciting. All the time, costs have been coming down, sharply in the case of solar energy and more gradually in the case of wind energy.

In the European context, the UK has been a relatively sensible promoter of renewable energy over the past few years. In the UK, the line of investment has been gradually up-sloping, whereas countries such as Spain, Italy and Germany invested a hell of a lot in solar when solar cost many times what it costs now, and the legacy of having had those booms is that they are going to have to pay for them in the future. In the UK, the cost of the renewable energy support to date—even according to the Government's figures, which I will come to in a minute—translates to about half a cup of cappuccino a week per head of the population. That is not a lot of money to pay, considering that we have raised the proportion of renewable energy generation from 6.7 per cent in 2009 to 25 per cent in the second quarter of 2015.

I take Tony Mackay's point about there being too much fat in the system—that is probably correct—but the CFD programme has shown that auction systems can bargain costs down pretty

effectively. In that respect, the first auction was very encouraging.

The UK Government's policy is built on one or two shaky foundations. First, it is insistent on energy security but also emphasises gas in a big way, and those two things look somewhat incompatible to me unless there is a domestic shale gas boom, which we do not really see any sign of. Secondly, it is hung up on the difference between base-load and intermittency, which has become an increasingly simplistic notion as time has gone on. Thirdly, there is the levy control framework—LCF—which we have dubbed the low-credibility figure because certain aspects of it mean that it takes only a partial view of the overall costs.

I will mention just one of those aspects, which is the wholesale price effect. Wind and solar are squashing down wholesale prices, the effect of which is that the computed subsidy goes up—the lower the wholesale prices, the higher the computed subsidy. They are almost kind of biting off their own tails. There should be a more sophisticated way of measuring the cost of support. It is right to measure that, but it should be done in a more sophisticated way.

The Convener: Thank you very much. That has taken up more than a third of our time, but it has been useful in setting the scene. It would be helpful if we could have slightly sharper responses from now on; otherwise we will never get through all the topics that we want to cover. I am keen to bring in members, who have questions. It would be helpful if members, rather than just throw open a question to all the witnesses, could direct questions initially to one panel member and then, if others want to respond to something that somebody else has said, they can just catch my eye and I will let them do that. Otherwise, we will only get through three questions.

Dennis Robertson: A recent report from Ernst & Young said that there has been a reduction in investor confidence but, at a meeting of the Energy and Climate Change Committee at Westminster in October, Andrea Leadsom said that the UK "remains an attractive place" for investors. What is your take on that? Is Ernst & Young correct that there has been a decline in confidence, or is Andrea Leadsom correct that we are still an attractive place for investors in renewables? Maybe Niall Stuart could answer that.

Niall Stuart: It is fairly unequivocal that the UK is a less attractive place to invest in renewables now than it was six months ago. Ernst & Young has quantified that in its quarterly attractiveness index. To me, the issue is more fundamental than confidence. The reality is that if a project can make the renewables obligation deadlines that have been set out, if it is pre-accredited for the feed-in tariff or the renewable heat incentive, or if it has been successful in bidding for a contract for difference, there is a viable investment case. We think that, in almost all such cases, projects will be able to access finance at a reasonable rate to allow them to go forward. The converse is that, if projects do not have access to any of those schemes, there is probably no business case for future investment.

I looked at some numbers from DECC this morning. For example, the closure of the renewables obligation will leave about 1.7GW of onshore wind projects with, in effect, no route to market. To me, the issue is not really about confidence; it is about whether there is a viable investment case. If there is a viable investment case, projects will be able to access finance, but a growing number of projects simply do not have a business case for further investment.

Dennis Robertson: Policy decisions need to provide stability so that the market is confident of the way forward. Some of the policy decisions that are being made at UK level to bring forward the deadlines for subsidies are surely playing a major part in affecting investor confidence.

Niall Stuart: It is those policy decisions that create that binary situation in which projects either have an investment case or they do not.

The Convener: Is that situation sector specific? When Amber Rudd made her speech more or less a month ago, RenewableUK gave a positive response to the announcements on offshore wind. Maf Smith of RenewableUK said:

"Rudd's speech provides clarity on where the Government stands on the future of offshore wind, which will give developers the confidence to invest in the British economy."

Are certain sectors more affected than others?

Niall Stuart: Different sectors are in different positions. The secretary of state's overall commitment was to a broad level of capacity from offshore wind through the 2020s, but there were clear caveats to do with certain levels of cost reduction being achieved by the sector. We think that that is a fair bargain, but we do not have any sense of the timings of future rounds of allocation. There have already been significant delays in the allocation rounds for contracts for difference. Our members in the offshore wind sector tell us that those delays are increasingly damaging and that it is vital that the first allocation round has taken place and is concluded by quarter 4 next year.

10:45

You asked whether the situation is sector specific. Investment is an issue in all of the power

sector. In her speech, the secretary of state highlighted the point that the current market framework is not delivering power from new renewables and will not deliver investment in new nuclear facilities without significant Government support and credit guarantees. We are also not seeing investment in new gas-fired power generation; the Government is clearly committed to taking steps to increase subsidy support to such generation in order to get it into the system.

Gordon MacDonald: Andrew Watkin, who is the head of the energy and marine team at Carter Jonas, has said that the UK Government's plans to change its subsidies

"will kill off the solar and onshore wind industries in the UK from 2016 onwards."

What does John Forster think of that?

John Forster: I suppose that it is easiest to use our recent job numbers; Ernst & Young has produced similar numbers. In solar energy in the UK, we are closing in on 35,000 jobs. We estimate—as I said, Ernst & Young's figures were broadly similar, so there are two different reports on this—that that number will fall by about 27,000. We believe that there are just under 3,000 jobs in solar in Scotland, so we think that that will fall by 2,400 next year.

Richard Lyle: I am concerned by what John Forster said about jobs, because there are quite a number of solar jobs in my region and especially in Uddingston. At one point, people thought that solar power needed continuous sunshine, as in places such as California. Will more solar farms be built? My view is that, when we build houses, we should put solar panels on the roofs. You mentioned that in your opening remarks. Do you agree that we underestimate solar and that we should invest more in it?

John Forster: I will take solar farms and housing separately. A number of solar farms are being built—for example, a 14MW solar farm is being built between Dundee and Perth, which will be the largest to date, and a 9.5MW solar farm is going up in Angus, while others, some of which are bigger than that, are in the pipeline. The trouble is that all such activity will die next year and that will be the end of it.

It is worth mentioning that there is quite a lot of activity on solar that will be developed post-2020. Large landowners are looking with developers at the potential to build post-2020. That reflects what I said about solar being able to operate subsidy free beyond 2020; it backs up the estimate that a subsidy-free time is looming for solar. As I said, it will be the first technology to go subsidy free.

You talked about residential new builds. New Scottish building standards have been expected for a time, which has allowed the industry to work out the best solution to meeting those standards. Solar PV happens to be the renewables solution to reduce carbon levels in new-build homes. The combination of the fact that the housing industry is starting to boom and the big commitment to new social housing that was announced recently means a significant future for solar in the new-build sector.

The difficulty with all such things is the time that is taken. The new-build build-out will take a while to get to the volume that I touched on in my opening words. I just mentioned solar farm opportunities post-2020. We have an industry that supports nearly 3,000 jobs now but, in the interim, there is little hope for those jobs—there is no opportunity in other sectors, such as wind, which Niall Stuart talked about.

There is no point in pretending—the solar companies, including manufacturers, distributors and associated parties, will be and are already shutting. Of course, we are in a growing economy and there are opportunities in other areas; many such companies, including mine, have other parts of their businesses and interests in other sectors, so they can redistribute jobs. However, we have created an infrastructure in Scotland and in the UK as a whole that is a centre of expertise for the world, quite honestly. It is well thought of—the UK development industry across all technologies is well thought of—yet we are about to destroy it.

Our consumers will spend the next 20 years paying for that investment. They will not pay a great deal—it is the half a cup of cappuccino amount that was mentioned earlier. We estimate that the past four years of solar feed-in tariff in the UK has added £1.33 per annum to the average consumer's bill. That does not seem like an awful lot of money. Paying just over 10p a month to support the solar industry for the past four years across the whole of the UK does not sound like an overspend to me, which is why I thought that the LCF reference earlier on was so appropriate.

The Convener: I have a couple of follow-up questions on solar and if anybody else wants to come in specifically on the solar point, it would be good to hear your views.

We have been here before, John, have we not? I remember that in 2011 we had all those predictions of devastation that did not come about. Are you just crying wolf again?

John Forster: The answer of course is that those predictions did come about because at the peak of that boom in solar, there were more than 8,000 installation companies registered in the UK and that figure has since fallen to below 3,000. What is interesting about that is that Germany had been through the same issue a few years earlier. It

had 55,000 installation companies and then the figure fell back to 8,500 because of a similar cut. The model is not unusual—this path has been trodden before.

Yes, there has been a 70 per cent reduction in the cost of solar panels, so the industry has got to a point where it has managed to adjust to the lower levels of subsidy that happened overnight in 2011. However, we are still talking about an industry that is half the size that it was at the peak of 2011. Unfortunately these cuts will be so much greater.

The Convener: Okay. Something caught my eye yesterday—there was a recent European Commission ruling on import tariffs on Chinese solar panels. According to the Solar Trade Association, that ruling will have a detrimental impact. Can you say a little bit about what impact it will have?

John Forster: Indeed. This is about the minimum import price—MIP—which is, in effect, a Chinese anti-dumping tariff that was introduced in December 2013. It was expected to end at the end of 2015 and it was scheduled to do so. However, an organisation called EU ProSun, which represents the manufacturing bodies in Europe, has appealed to the Commissioner for it to be extended.

The announcement that you refer to was that the Commissioner will now review the MIP. The trouble with that review is that it will take 12 to 15 months and, in that period, the expected reduction in costs that would have come on the back of the MIP ending will not happen.

To put a number on that, SolarPower Europe, which represents all the trade bodies across Europe for solar, estimated earlier this year that the removal of MIP would lead to a reduction in the cost of panels to the tune of perhaps as much as 25 per cent, based on global pricing. As an industry, we were hoping for that potential significant fall in prices to happen. We expect falls in prices because the industry is under so much pressure but, unfortunately, those falls will not be good enough to make up the difference.

The Convener: Presumably, if we were taking evidence from the manufacturers in Europe, they would be saying that this was a great decision by the European Commission.

John Forster: Yes. Not surprisingly, Angela Merkel has welcomed the decision. However, across Europe, all the trade bodies that install panels have recognised that unfortunately, that decision will significantly depress installation.

The Convener: If no one else has a point on solar in particular, we can move on.

Lewis Macdonald: I want to follow up on a couple of the points that came out from the initial introductory comments. One was around community energy and the impact of the recent changes on that and the prospects for it in the future. I think that Felix Wight said that the support mechanisms are the same across the UK; Scotland has been so successful on community energy because of how those have been applied and the added value of Scottish Government policies over a considerable period of time.

Given that we are now looking at a potential end to new developments on both wind and solar at community scale, what mechanisms or policy applications will make a difference in Scotland now and over the next two or three years in particular? Also, what can be done in order to ensure that the community energy model—which has been so successful, as Felix said, in the Western Isles—is applied elsewhere in Scotland?

Felix Wight: There are two routes. One is for the Scottish Government to continue to work with the UK Government as it does, particularly around community energy. One faint hope from the Government's current deliberations in response to the feed-in tariff review is that there will be some additional safeguards or support for community energy schemes in that respect. Across the UK, the sector has made clear practical recommendations about how support could be more targeted. We should bear it in mind that the feed-in tariff policy was originally introduced for communities, households and other non-energy professionals. However, looking at where the money has gone, it is clear that less than 1 per cent of feed-in tariff installations have gone to communities; that calculation is based on figures from the Office of Gas and Electricity Markets. In our view there are strong grounds for saying that the remaining budget should be more targeted in line with the original policy objectives.

On what we can do in Scotland, the situation is clearly quite challenging, but there are areas of opportunity such as innovation in energy storage and supply-side and demand-side management. The Scottish Government has levers to help to support those kinds of projects. I am sure that Keith Bell can talk about projects happening elsewhere in the UK. The network here is part of an ecosystem, but there is a particular focus in Scotland on how we can link the skills and capacity of community organisations that have developed or want to develop new renewable energy projects with the other side of the fence: energy supply, distribution, storage and management, not just in electricity but in heat and transport.

There is an existing scheme called the local energy challenge fund that has supported a

number of schemes, and we hope that it will continue. It is a smaller toolbox in comparison with the UK as a whole and we cannot do that work without some alignment with and continued support from the UK energy policy, but I see the opportunities in Scotland as being in that area.

Professor Bell: Some of the issues that have emerged from the discussion in the past few minutes have concerned the links with the energy system and with the wider economy. We have talked about jobs in solar PV installation, and we should consider the German manufacturers' response to the perceived dumping of cheap panels from China. A few years ago, German industrial policy was about trying to build a market for solar PV panels in order to build the manufacturing industry. I remember hearing a speech from a former German civil servant who said, "Well, it is not as if Germany is the sunniest place in the world, but we want to make these jobs here, so we have to create a market to create those jobs," and Germany succeeded in doing that. Unfortunately, however, the market for its manufacturers has been undercut.

Felix Wight spoke about the communities that can benefit from community energy. We should also recognise the community benefits that could result. Felix makes some valid points about where those benefits have gone, but the question whether those sorts of schemes develop is about not just a push from the top down but a pull from the communities themselves. We need to look at how we can facilitate that.

A lot of it comes about because the alternatives are quite limited; that is just a fact of geography. Most of the sources of energy that we want to use, whether for heat, light or transport, will be variable. Indeed, the need for energy is variable. What can we do about those imbalances? We can spill those out in time—that is what storage means—or in space, if someone has a surplus at the moment at which someone else has a deficit, and vice versa. That is what networks do.

In the more remote places, the networks are quite expensive. Storage technologies and other sorts of technologies become more cost competitive in comparison, but that does not necessarily mean that the whole thing will be cheap. That is where the local economic benefits become so important in making a case for an investment that will facilitate all sorts of other things in those kinds of places. The question of exactly how we do that goes way beyond my area of expertise, so I will leave that for others to discuss.

Lewis Macdonald: Those comments are useful, but how do you link those points with some of the bigger questions on the overall energy balance? A number of witnesses have commented on how that balance is changing or could change.

On the one hand, there are things that can be done at a community level. It is good that we have heard a bit about those things. However, I am also concerned to find out a little more about what witnesses think about some of the macro questions. Carbon capture was mentioned, for example, and the issue of how costs are attributed is also important.

11:00

Dr Winskel: One of the things that still matter at the system level is scale. Certain technologies, such as solar power, are modular and can work economically at various scales, such as the community scale and even the household scale, although that is not to say that ground-mounted solar farms are not an economical way of deploying solar power. However, for CCS, offshore wind and so on, scale matters a great deal.

Economies of scale are important in big parts of the energy system. That becomes problematic, because the current reluctance to support innovation of the kind that reduces the costs of those large technologies relates to deployment support. The UK Government is now saying that it will spend more money on innovation. The suggestion is that that is a longer-term view of spending money on research and development, and there is an argument in parts of the policy community that that is the best way of spending research money.

A lot of evidence suggests that the way in which the costs of such technologies come down is through trial deployment and demonstration projects. That is where the costs are discovered. It is easy to end up with optimistic cost assessments in a system model that involves doing a lot of things with CCS and offshore wind in the short term. Through the modelling work that we have done over the past 10 years, we have found that the costs are discovered when people try to build projects. The problem is that that requires significant capital sums. Whatever increase the UK Government has announced for R and D is outweighed by the decision to make £1 billion-worth of savings on the CCS demonstration programme without any suggestion that there is another route for CCS deployment.

In its recently published document "The fifth carbon budget", the Committee on Climate Change is still saying that CCS promises to reduce the costs of the UK decarbonisation transition by 50 per cent. There is a huge proposed role for CCS in the longer term, but no suggestion that that is being faced up to. Where

do we go? The fact that the decision was made in a way that lacked any forewarning for the industry and the research community automatically did quite a lot of damage. I am concerned about the fact that these large-scale technologies, which are seen as being a big part of the solution, are not a part of the innovation solution at the moment.

Joan MacNaughton: I will talk about the general point and about CCS, which, at one point, I knew rather a lot about and was engaged in. I agree absolutely with what Dr Winskel said. The issue is not just about the cost. The world cannot meet the 2°C target—or whatever target comes out of Paris—without CCS because, although it has been presented as a way of protecting coal, it must be used in gas-fired power generation, and there is no other technology that can be used in relation to many of our industrial processes, including refining and cement manufacture.

Given how far we are down the CCS road, it was extraordinary and bizarre to decide to withdraw the money. That leads me to the general point that there seemed to be no linkage to any industrial policy. We were building a supply chain, we have a lead in the UK and we have excellent storage for CO_2, which would be usable by other countries in Europe that do not have storage capacity. That means that we could make a long-term play for a growing market that could provide a lot of industrial, commercial and other benefits. CCS ought to have been part of our vision for the energy sector, and not just for the electricity sector.

That makes the general point that Keith Bell mentioned about the macro impacts, which Lewis Macdonald asked about. In this area, one is always at risk of focusing on a bit of the problem and not thinking about co-costs and co-benefits. I do not dissent from Angus McCrone's points about the levy control framework, but the way in which it is calculated has caused the Treasury in London to say that it cannot afford to put those burdens on cost and that, actually, we are on track to meet the renewable target in the power sector by 2020. However, that is a very short-term view. It does not take account of the need for continuity, which the committee has heard about so eloquently from others in relation to solar. Once the skills in the supply chain are destroyed, it costs a lot of money to bring them back.

The Treasury's view also does not take into account the medium to longer-term costs or the impact on cost of the damage to confidence—an issue that was raised a moment ago. The approach that is being taken increases the perception of risk, which increases the cost of capital.

As I said in my introduction, we have to look at the system as a whole and consider what our vision for the grid is. We inherited a gold-plated grid that was nationally built. We cannot expect people to build, in a piecemeal way, a modern replacement for that grid that takes account fully of innovation and enables us to do things such as maximise our management of demand response and the contribution of renewables. That is a really important issue. The way in which we attribute the costs of the grid to the users of it—either new people coming on to it or people who are already on it—will fundamentally affect the shape of the system in the future as well as the viability of some of the sectors that we have discussed.

The Convener: I am conscious of the time and I have lots of members who want to come in, so I am afraid that we will have to move on from Lewis Macdonald.

Patrick Harvie (Glasgow) (Green): I welcome the comment about the vision of where we are going and the use of the phrase "industrial policy", because that has been missing from some of the debate. We started with a question about how attractive an environment the UK is for investment in solar or other renewable sectors, but we cannot answer that question without thinking about what and how much we are trying to achieve.

The UK Committee on Climate Change has a number of scenarios on renewable energy generation. The lowest end suggests at least a doubling of installed capacity and more than a doubling of electricity generation from renewables by 2030. It already looks as though we might fall short of the 2020 target in Scotland as a result of UK changes. The higher end of the range of scenarios suggests a trebling or more than trebling of that installed capacity.

The Convener: Can we have a question, please?

Patrick Harvie: The question is simple: is the current UK policy and financial framework remotely compatible with any achievement within the range that the Committee on Climate Change says is clearly necessary by 2030?

Angus McCrone: There are grounds for hope. Niall Stuart talked about the difference in investor confidence between the offshore wind sector and other sectors. The offshore wind sector has been careful to cuddle the UK Government close and to be supportive in the hope that it will continue to get CFD support. The proof of the pudding will be in the eating, but there is hope that that will continue to happen. That is important, because offshore wind is probably one of the three major technologies on which the UK has the most potential to export expertise and create supply chain jobs.

On a number of occasions, the UK Government has mentioned the possibility of a subsidy-free

CFD for onshore wind and solar. Quite what that means is unclear because, with those technologies, nothing will be built on the basis of wholesale prices. On a windy day with a lot of generation, the wholesale price will tend towards zero, so there has to be a mechanism for giving some tariff certainty. What that is and whether it is subsidy free is an interesting question.

Patrick Harvie: Saying that what that means is unclear does not sound like grounds for hope.

Angus McCrone: I think that that provides grounds for hope, because it gets around the UK Government's rhetoric about not subsidising the technologies further. If the Government can come up with a form of words to the effect that the CFD is subsidy free, there will be room to go forward. Scottish Renewables has talked about a figure of £80 per megawatt hour as a possible definition of "subsidy free", and we can argue about whether that is too high a figure. It might be possible to bridge the divide in rhetoric between the UK Government and the industry and to come up with a figure that both can agree is subsidy free.

Niall Stuart: I am wary of jumping in and allowing Patrick Harvie to put words in my mouth. I do not remember the precise question, but I will answer it in this way. I do not see that we have a policy framework in place that will deliver the scale of renewables that the Committee on Climate Change believes is required to hit future carbon budgets in the way that keeps costs down for consumers.

We think that onshore wind and solar can contribute significantly to the scale of capacity that the Committee on Climate Change has set out. That will be best done by continued but reducing support from the UK Government, and that will be best achieved by implementing some kind of contract for difference at a level that we can agree is subsidy free.

Scottish Renewables did not present the figure of £80 per megawatt hour. The Committee on Climate Change has asserted that anything that is at or below £80 per megawatt hour should be considered to be subsidy free because it is below the cost of alternative generation, such as new-build gas generation plus carbon costs.

The Convener: Does Tony Mackay have a view on costs?

Tony Mackay: I agree with Angus McCrone and Patrick Harvie that, although the policies at the UK level might not be shambolic, they are creating a lot of uncertainty.

I make the point that only a small proportion of the equipment that is going into onshore and offshore wind farms and into marine energy projects in the Pentland Firth is built in Scotland. Some older members of the committee might remember the Offshore Supplies Office. When the oil and gas industry in the North Sea was being developed, the Government set up the OSO, which had a target of making sure that at least 70 per cent of the work on the North Sea oil fields was done in the UK, and that worked. Members might remember the old fabrication yards at Nigg and Ardersier and elsewhere.

The UK's share of the building of renewable energy equipment, including possibly that for solar, is probably about 10 per cent. The turbines are all being built overseas. Last week, Statoil placed a contract for a new floating wind farm off Peterhead with Siemens, which will build the turbines in Germany. The UK-built content of a lot of the developments is tiny, so the number of jobs in the supply chain is similarly tiny.

Johann Lamont: I am interested in hearing what people think is the United Kingdom Government's motive. If there is a consensus about renewables, why is the Government causing chaos? Does that reflect to some extent the evident exasperation in some communities about the number of onshore wind turbines and the sense that no interest will ever be generated in offshore, tidal or wave energy because of the subsidies for onshore? How would you address that? Is something else driving decisions? Has the UK Government fallen out of love with the idea of renewables altogether? I am interested in people's views on that.

11:15

My next point is about community energy. One of the strongest arguments for community energy initiatives concerns the economic impact on the areas where they are developed. They create jobs and economic opportunities—they might even stabilise the economy—in fragile communities. Has that been quantified in any way? If such initiatives do not make a difference, why should a little more be spent on one or two turbines? If they make a difference, there is a need to be strategic about the policy and to create an incentive for it.

The Convener: I will let Felix Wight answer the second question while the rest of the panel members apply their minds to the first question.

Felix Wight: Under the old model, a 1MW wind turbine would generally generate about £5,000-worth of income for a community benefit scheme, but if the turbine was community owned, the figure would be £100,000. The difference is material. Community ownership cannot apply in all circumstances, and we certainly do not believe that it is the only model, but there is space for more of it, particularly if we look at the opportunities that have come up on publicly owned

land through, for example, the Forestry Commission schemes for community investment.

There is an opportunity for community ownership to be a bigger part of the mix; in addition, it makes a difference not only financially but attitudinally. Survey after survey has demonstrated that most people are overwhelmingly in support of local ownership. Furthermore, more than 90 per cent of community schemes have a successful planning outcome. Therefore, the schemes are not only supported locally but recognised in the planning process.

Johann Lamont: There is economic benefit to a local community and, because people like that, it encourages them to move towards renewables. Is there a strategic approach to encouraging communities to take up such schemes or is it entirely happenstance?

Felix Wight: The UK Government's approach has not been very focused in supporting community energy. Belatedly, in 2014, it launched the community energy strategy, but that has not led to material support for communities. We hope that, at this juncture with the feed-in tariff all but over, something will rise from the ashes and the remaining funds will be used to provide more focused support.

The Scottish Government has provided focused support through its community and renewable energy scheme. That makes the most of the materials that the UK Government makes available, rather than releasing significant funds in Scotland for community schemes.

Professor Bell: We can all speculate in a similar way about the UK Government's motivation. I have no direct line to it, but the opposition from a lot of the shires to wind turbine development has clearly been documented.

I guess that John Forster has a view on the reduction in support for solar PV. Perhaps—ironically—the cost-reduction success has made the UK Government believe that the policy is more successful than it has been. Why is the Government so in favour of offshore wind and of nuclear power? Why has it withdrawn its support for CCS, as Joan MacNaughton said? That is a slightly harder question to answer. That does not seem to tally with the UK Government's claim about reducing costs to consumers, because nuclear power and offshore wind are pretty expensive ways of getting low-carbon energy relative to the other options. However, as Angus McCrone said, other potential economic benefits derive from that, although it would be the first time that the UK Government has come up with an industrial strategy that links in, even if it has not said that that is the case.

Mark Winskel's comments on big technologies are important—one learns by doing. When we had the financial crisis a few years ago, people talked about the banks being too big to fail. Maybe nuclear power and CCS are almost too big to succeed, as it would take a huge amount of investment and effort to get behind them.

I have heard gossip—it is nothing more than that—about why the UK Government withdrew its support for the CCS competition. One suggestion is that it had only one competitor and that it could not just give the money to that company. The other suggestion is that some of the big energy companies globally—the partners in the white rose and Peterhead schemes, for example—are interested. I do not know whether this is part of the rationale, but they should have the wherewithal to put in their investment and get the benefits from it. I am sure that Joan MacNaughton has more insight into that than I have.

John Forster: On your first question, when we look at the range of subsidies that have been cut and the range of technological solutions, scenarios and scales that have been affected simultaneously, I think that with regard to the domestic feed-in tariff, people might have been worried about wind turbines, but the 87 per cent cut in solar shows that the decision making has nothing to do with whether someone dislikes solar farms or wind farms. There are other drivers, and most of us who are close enough to the situation believe that this is probably coming from the Treasury rather than DECC, even though DECC is making all the announcements.

To pick up on one or two other points, I think that recognition of the need for traditional generation is quite widespread in the renewables sector. However, we need a decarbonised solution, which means support for the concept of gas with carbon capture. Equally, I think that devolved energy and devolved use are really the future.

As for what we are doing about long-term thinking, I will quickly paint a scenario that I have used a number of times and which seems to work. Five years from now, new homes will have solar PV and solar thermal for hot water, with storage for both inside; the car that pulls up outside will be powered mostly by a hydrogen fuel cell and an electric battery; in the summer, the excess power that is created by the PV in the house will charge up the car; and in the winter, when the house is a bit short of power, the car will charge up the house's battery system and support the house for the next 24 hours, and the hydrogen will be topped up at Tesco.

Those technologies exist and can be bought now, and they mean that the houses in question will have almost no need for large energy. They

will still be connected, but they will have little use for it; they will provide their own solutions. Moreover—and bearing it in mind that, as the Hinkley Point example shows, the cost of energy will inevitably rise—those solutions will be self-funding. In fact, Hinkley Point is great for showing just how expensive energy will become. If we think that supporting energy is expensive now, wait for five or 10 years and it will look really scary.

The solutions, the potential for manufacturing and all the other things that we have talked about are hidden in the little scenario that I just outlined and are realistic. By the way, you will not need to plug the car in yourself; you will be able to drive up to your house and on to a plate charger, and the car will connect itself.

Dr Winskel: It is important that, in this discussion, we understand where the UK Government has got to. According to its latest projections, it expects the carbon intensity of the electricity supply industry to be 100g CO_2 per kW by 2030—which is at the absolute upper limit of where the UKCCC wants it to be—while, on the other hand, it is also projecting a very significant decarbonisation of the electricity system.

The Government has not abandoned the commitments in the Climate Change Act 2008, and we have to recognise that it sees a consistency between giving gas a much bigger role in the 2020s, giving conditional support to offshore wind and meeting the carbon budgets. We have to ensure that we hold it to account on that.

There is a legitimate concern about the LCF going up to the maximum headroom by 2020; indeed, I believe that the convener mentioned a higher figure of £13 billion, which is well above the headroom.

To some extent, some of this was always going to happen. The question is what we wanted from a Government that was looking to have a rational economic relook at the policy, and that means accepting that we would have had some of this direction of travel in any case.

However, what has put a large part of the research community and the industry into consternation is the haphazard way in which things have been done. The policy announcements have been made without any sense of a system view, and the latest energy projections contain no suggestion that there is a strong commitment to a longer-term transition after 2030—that is not there at all. We are storing up problems in the gas plant stock that it is suggested is going to be built. There is an understandable reining in of the subsidy regime, but what is missing, alongside that, is a commitment over the longer term.

On the community energy question, there needs to be another look at the question of system cost and intermittency. The problem is that, as Amber Rudd suggested in her speech, every intermittent source has to bid independently, of itself, as firm power. Again, that shows a lack of a system view. How do you balance the system, and how are the costs of intermittency borne across the system? The danger of the view that every intermittent source has to contract for its own back-up and reserve is that there is a great loss of all the capacity of the system at scale to supply power much more affordably. That is a legitimate concern, as the way that it has been gone about is probably far from economically optimal.

Niall Stuart: Rather than talk about the motives behind the Government's policy, I will talk about the narrative that is being presented around it. That has very much been about the costs of onshore wind and solar despite the fact that the latest projects are 14 per cent cheaper than the deal that has been agreed with Hinkley Point nuclear power station. They are the lowest-cost low-carbon technologies that can be deployed at scale.

There has also been a focus on intermittency despite the fact that gas and renewables are potentially a very good fit for the future energy system. The party that is in government obviously feels that its policy plays out well with what it sees as its constituency, despite the fact that every survey has shown that something like two thirds of people in Scotland and the UK support the growth of onshore wind.

On communities and jobs, in March the Department for Business, Innovation and Skills published a study that shows clearly that 21,000 jobs are supported by the wider renewables sector across Scotland. Those jobs are geographically diffuse and are located in communities all over Scotland. One way in which communities have funded their projects is through local share offers or local funding rounds. There is a big opportunity for us to scale those up and do something on a national scale that would allow us to widen ownership of the sector through some kind of bond or nationwide investment scheme.

Alternatively, we could achieve the same outcome through more public pension schemes investing in the sector. At the moment, only the Strathclyde Pension Fund has invested in the sector, and that is only on a very small scale with a £10 million investment through the Green Investment Bank. There are plenty of ways in which we could redefine community ownership and widen the ownership of renewables in Scotland.

Johann Lamont: Do you accept that there are places in Scotland where people feel that there is

an overconcentration of wind farms? Do you not accept the argument that there is no incentive to research and develop offshore wind because onshore wind is doing very nicely financially and stacks up? Or do you think that there should be a shift to offshore wind?

Niall Stuart: There is still plenty of scope for the growth of onshore wind, but our members tell us that there are schemes that already have consent but are not being invested in and have bowed out because they have missed the deadlines for the RO and have not been successful in their bids for a CFD. There are consented schemes that will not be built because they do not have a viable investment case.

We have to look at offshore and onshore wind separately. There is plenty of interest in offshore wind, but the people who want to develop offshore wind are waiting for the next option round to be taken forward by the UK Government.

The Convener: I am conscious of the time. It is 11.30 and we said that we would let the evidence session run for 90 minutes, but I am minded to let it run to 11.45. That will give us a little extra time, but we will still be tight for time. Three members have been very patient and have not had a chance to say anything yet, so we will hear from them first. If we have any time left after that, I will bring in other members, but I am not sure that we will have.

11:30

Joan McAlpine: I want to concentrate on marine renewables technology, which we have not said a lot about so far.

We had a very interesting session on marine renewables in April, in which Neil Kermode from the European Marine Energy Centre in Orkney spoke to us. One of the points that he made related to developing technology outwith the UK, which Tony Mackay has talked about. He compared the way that we treat marine technology with the way that the Danes invested in wind technology several decades ago and talked about how the Danes kept faith with wind technology even when they had setbacks. As a result of that steady investment, they now supply turbines and are leaders all over the world.

Neil Kermode said that what was going wrong with marine technology was that we were too focused on getting a very quick return. Even the UK electricity market rewarded companies according to the amount of electricity that they could produce quickly, and that resulted in setbacks. The witnesses' real fear was that, because there had been an initial setback, we would lose faith in marine technology, and others would then take over in the markets.

The witnesses also said that contracts for difference were inappropriate for marine technology and that investors did not have confidence because of the failure to guarantee the grid and interconnectors that were needed to support marine power.

Do the panellists want to reflect on that? Do you recognise those concerns?

The Convener: Maybe we could start with Tony Mackay, who said quite a lot about marine energy and made comments about Wave Energy Scotland in his written submission. Do you want to respond to that question?

Tony Mackay: Yes. I am an economist, not an engineer, but I have a friend who is an engineer who has worked at EMEC in Orkney for many years. He said to me repeatedly that a lot of the R and D work that went on there by Aquamarine Power, Pelamis Wave Power and other companies was never going to be viable. He said that, from a technical point of view, those projects were never going to become commercial.

As an economist, my impression is that there are tremendous, realistic opportunities in tidal energy. I was in Nova Scotia recently, where a lot of progress has been made in the Bay of Fundy. I think that we will have some commercial tidal energy projects in maybe three or four years, but the £20 million or £30 million that the public sector has lost on wave energy projects could have been better used.

Joan McAlpine: I think that Neil Kermode said that people need to fail with the emerging technologies before they are successful and that, if everything is predicated on becoming commercially successful right away, that will not necessarily result in the best technologies in the long term.

Tony Mackay: Yes. I accept that.

Professor Bell: Tony Mackay is right to distinguish between wave and tidal technologies. My understanding is similar to his—that tidal technology is closer to being commercially viable. However, the point that Joan McAlpine made about the difficulty of getting investment is also correct. I have talked to a colleague at the University of Strathclyde, who has a proposal for a particular tidal turbine, which has gone out to a spin-out company. That is the sort of thing that universities are supposed to do, but there is terrible difficulty in getting investment. There is a big dependency on outfits such as Scottish Enterprise and Highlands and Islands Enterprise.

Obviously, there is a tension between the venture capitalists who want their quick return and a lot of return, and some state-funded bodies. Maybe those bodies make mistakes, as Tony

Mackay suggested. On the other hand, it is absolutely right that there will be failures, especially with the less mature technologies. There will be things that are tried that will not work—we must be cognisant of that.

Joan MacNaughton: Bodies might not only make mistakes; if we are going to get the innovation that we need, state funding has to be prepared to tolerate some failures, which will be written off either because the whole technology was wrong or it was at too early a stage.

Tidal is very promising. A lot of the technology is mature, because it is precedented in hydro—I am talking about the turbines. That brings us back to the point about long-term investing and long-term confidence. With the resources that we have around this island, it would be a huge missed opportunity not to think about how we can exploit our marine technologies.

Niall Stuart: Innovation will become increasingly important in the energy system as a whole. There is going to be huge global demand for innovative solutions in how we manage the energy system and energy storage. The UK and Scotland should be alert to that. We need to think about how we can make more of the world-class expertise that we have around this table and around Scotland.

As far as wave and tidal are concerned, we have had to reconceptualise where much of the wave and tidal sector is. We are in a research and development phase, and perhaps a demonstration phase, so funding should be packaged in a way that is appropriate to that, but we are also demanding that that research and development activity comply with rules for commercial generators. For example, the same grid rules that cover Longannet cover EMEC. There is a massive burden of grid charges. While we are funding the industry to carry out R and D, we are charging disproportionate amounts of money for people to connect to the grid when they are in an R and D phase.

The Convener: We need to move on again.

Chic Brodie: It was interesting to hear Mark Winskel say that we need a hard reset, that we need to take a rational look at the whole area, that research by the Government is haphazard and that we need a commitment to be given. I think that all that is true, particularly given the paradox that, as we found out at a meeting in the Parliament one evening with the Institution of Nuclear Engineers, it will cost us £1 billion a year just to insure Hinkley Point, when that is the very sum that has been denied the carbon capture and storage activity.

All the information that we have been given is very useful, but I want to look at the more short-term activity and what action we can take with the UK Government in the immediate term. Two weeks ago, Cordi O'Hara, director of UK market operation at National Grid, told Westminster's Energy and Climate Change Committee that there was a de-rated capacity margin in the system of 5.1 per cent and that a notice of insufficient system margin had just been issued. As that is the first NISM that has been issued for five years, questions are being asked about the system margin. James Heappey MP asked about the lost capacity of 7,366MW, which means that the electricity capacity has gone down from 68,966MW to 61,600MW—

The Convener: And your question is—

Chic Brodie: I am coming to it; I am sure that you will wait for it.

Because of the de-rating factor of 85 per cent, that has come down to 52,000MW when the winter outlook this year is for 54,200MW. While we enjoy such conversations, I must ask what we are doing. Why are we sitting back and not taking on the UK Government? Are we happy to have power barges or power ships on our rivers, as is apparently being planned? What are we doing? I put that to Niall Stuart.

The Convener: Is that a rhetorical question?

Gordon MacDonald has another question. In view of the time, I will take his question as well, and then I will let as many of the panel as I can respond to both questions. Otherwise, we will just run out of time.

Gordon MacDonald: My question relates to Joan MacNaughton's opening remarks and the World Energy Council report that placed the UK on negative watch for affordability. I want to try to understand why the UK Government appears to be moving away from the cheapest renewables in favour of gas and nuclear. How do we address the subject of affordability with the public and with industry, because it impacts on jobs?

The Convener: I invite Joan MacNaughton to respond directly to that point, after which other members of the panel can come in or can respond to Mr Brodie's point.

Joan MacNaughton: The UK was placed on negative watch because, although it has maintained a high rating—it is in the top five of 130 countries—it was felt that security of supply was under threat. I am referring to the capacity margin that we have just heard about. In addition, the UK's affordability performance has gone down. The key message that is coming out of the work that we are doing with 130 countries is that we can add to the costs of decarbonisation by increasing the perception of risk and the perception of political risk.

Some of the debate on affordability ahead of the UK general election stopped quite a lot of investment, because people were holding back. That was at a time when investments perhaps should have been made, so already there was a sub-optimal outcome. If people do not know the clear direction of policy, they have to think that projects will be higher risk, and then the cost of capital will encompass a higher risk premium. That does not mean that businesses can expect an unchanging or inflexible policy. Of course the policy has to adjust to take account of changes in circumstance and cost or whatever, but the Government needs to communicate what the triggers for those changes will be. They could be timed review points, a percentage cost reduction or a certain level of deployment.

From reading Amber Rudd's speech, it seems to me that one of the justifications that she gave was that, because the UK is on track for its 2020 targets on wind and solar, the Government feels justified in looking for control of costs there. However, that was not signalled beforehand. There has to be predictability about how change is going to happen. Actually, quite a lot of things could be considered in Scotland around costs within the context of the devolved powers, but that is maybe a conversation for another day.

Professor Bell: Electricity security of supply is home territory for me as an engineer. If we look at the UK Government's loss of load expectation standard, which underpins the capacity market, we find that a de-rated margin of about 5 per cent is about the right answer. We could have a discussion about what that really means and whether the risks are acceptable or unacceptable—we can never have no risk. We could also discuss whether the capacity market delivers what it is supposed to. The capacity is supposed to be available in 2018-19, but there are valid questions about whether it will all be delivered and what will happen in the meantime.

As someone who used to work in the electricity supply industry, part of me inevitably says, "Oh, they don't do things as well as they used to." However, National Grid, as the system operator, and the two transmission licensees in Scotland have some very professional people working in them. I have a lot of contact with them. There are some methods and academic things that we can help them with but, at a certain point, we have to trust them to get on with it and do it.

On Chic Brodie's point about using barges, I believe that that was offered, but my understanding is that it is not where the contract was placed—it was with Peterhead.

Angus McCrone: I have a quick point that pulls together what we talked about on affordability with Johann Lamont's question about the UK Government's motivations. One of the motivations is concern about electricity bills. A few years ago, after the financial crisis, there was a lot of public concern about utility bills going up. Actually, gas prices went up more than electricity bills. However, I think that the Government has not looked carefully enough at its own numbers. Those numbers show that electricity bills went up by 25 per cent between 2010 and 2014, but that is based on an assumption of constant kilowatt hour use whereas, actually, kilowatt hour use was going down because energy efficiency and other measures were reducing the amount of electricity that households were using. If we take that into account, the increase was only 14 per cent, not 25 per cent. That is still an increase, and a lot of it was not due to renewables. The electricity bill factor is not as much of a problem as the UK Government says it is.

Felix Wight: To respond to Mr Brodie's question about practical measures that can be taken in the short term, we have stranded assets in Scotland and we are at risk of having a lot more as a result in part of the existing electrical infrastructure not being able to accommodate the output of operational generation schemes. I would like the Scottish Investment Bank to underwrite investments that individual generators cannot afford, thereby fast tracking investment in infrastructure, which can mean that generators can operate at their full output. Ofgem has supported that model. That is one step.

A second step is to encourage as much as we can the UK Government to keep the focus on including within the next CFD allocation support for remote island wind schemes. The Scottish Government has put in a lot of effort to secure that, but things have gone a bit quiet on that. It is important that that comes back in, because several hundred megawatts of generating capacity has been consented and could be built very quickly if we get the security over the business model that would come from a remote island wind CFD.

11:45

John Forster: The answer to Chic Brodie's question on what is happening in the short term is generator farms. The Government is subsidising diesel generator farms that share connections with large wind and solar schemes in the south of England. There are 159 of them currently going for planning and aiming to get into operation in the coming months. They will be connected to existing solar and wind sites. There is a good logic in having solar connected alongside an existing wind connection. Installing solar alongside wind in future is a strong potential opportunity for a lower-

cost solution; as I said, they work well together. However, that is what is happening right now.

Niall Stuart: It has been a while since I looked at the figures but, certainly, in the past few years, the UK had among the cheapest gas prices for consumers in the EU 15 and electricity costs have been no worse than average.

On what the Government can do to help the power industry to grow and deliver the power that we need, capital is a huge cost in our sector. It has been described by one of our members as the fuel of the renewable energy sector. We need certainty to bring capital into the sector and keep costs down. That is best done by working with the industry to create a viable investment framework, and we think that that is best done through the existing mechanism that has been developed in the past five or six years, which is the contracts for difference mechanism. Through that, we can secure new generation while putting pressure on costs and keeping bills down for consumers.

The Convener: On that note, we will have to end proceedings. I thank all our witnesses for their time and for coming along. The discussion has been helpful. We had a fair amount of time, but we perhaps did not get as far into all the topics as we might have done. If any of the witnesses would like to write to the committee and add anything to their evidence, we would be pleased to hear from you and that would be useful. I realise that time was constrained.

We now go into private session.

11:47

Meeting continued in private until 12:37.

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