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Pàrlamaid na h-Alba

Official Report

ECONOMY, ENERGY AND TOURISM COMMITTEE

Wednesday 7 December 2011

Session 4

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ECONOMY, ENERGY AND TOURISM COMMITTEE
15th Meeting 2011, 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)
*Anne McTaggart (Glasgow) (Lab)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Professor Ian Arbon (Institution of Mechanical Engineers)
Peter Atherton (Citigroup)
David Cunningham (Altium Securities)
Fergus Ewing (Minister for Energy, Enterprise and Tourism)
Dan Finch (EDPR UK)
Helen McDade (John Muir Trust)
Stuart McKay (Scottish Government)
Professor Paul Mitchell (University of Aberdeen)
Colin Ormiston (Vattenfall Wind Power Ltd)
Joe Philips (GL Garrad Hassan)
Niall Stuart (Scottish Renewables)
Felix Wright (Community Energy Scotland)

CLERK TO THE COMMITTEE

Stephen Imrie

LOCATION

Committee Room 2

Scottish Parliament

Economy, Energy and Tourism Committee

Wednesday 7 December 2011

[The Convener *opened the meeting at 09:31*]

Decision on Taking Business in Private

The Convener (Murdo Fraser): Good morning and welcome to the 15th meeting of the Economy, Energy and Tourism Committee in 2011. I remind everyone present to turn off their mobile phones and other electronic devices.

I have apologies from Patrick Harvie MSP, who is unable to be with us.

Agenda item 1 is a decision on taking business in private. Are members happy to take item 5 in private?

Members *indicated agreement.*

Subordinate Legislation

Storage of Carbon Dioxide (Licensing etc) (Scotland) Amendment Regulations 2011 [draft]

09:32

The Convener: Under item 2, the committee will take oral evidence on the draft Storage of Carbon Dioxide (Licensing etc) (Scotland) Amendment Regulations 2011, which is a Scottish statutory instrument that is subject to affirmative procedure. I welcome the Minister for Energy, Enterprise and Tourism, Fergus Ewing MSP, and his colleagues.

The motion on the instrument, which recommends that the regulations be approved, will be debated under the next agenda item. The officials who are accompanying the minister will not be able to participate in that debate.

I ask the minister to outline the background to and purpose of the draft regulations. The committee can then ask questions, before we move to the formal debate.

The Minister for Energy, Enterprise and Tourism (Fergus Ewing): Good morning. As we know, the energy opportunities for Scotland are enormous, but a balanced energy future depends on more than renewable power—there must be cleaner thermal generation alongside it. Hydrocarbons will, of course, remain a central element of the energy mix in Scotland and the world—indeed, I spent yesterday in Aberdeen visiting a number of the hugely successful oil and gas companies that are so important to our economy—but we have a duty to minimise carbon emissions and to ensure sustainable economic growth.

Coal is the most abundant and least expensive but most polluting fossil fuel, and carbon capture and storage is the only technology that is capable of cutting fossil fuel emissions by up to 90 per cent. One of our energy pledges was to support the development and implementation of CCS technologies in Scotland through collaboration with academia, industry and other interested parties. The economic opportunities for the development of a CCS-based industry are considerable. We have a strong industry capability, world-leading expertise, research and design capabilities, and some of the best carbon storage sites in Europe. Up to 50 per cent of the potential storage sites in Europe are in Scotland's depleted oil and gas fields.

We are deeply disappointed that the United Kingdom Government decided not to fund the CCS project at Longannet. However, the case for

CCS deployment at Peterhead and elsewhere in Scotland is extremely strong and we will continue to do everything that we can to turn Scotland's great CCS potential into reality.

We are required to implement the European Union directive on the geological storage of carbon dioxide. The Scottish Parliament has made great progress on that by approving a number of CCS regulations and by considering the draft regulations this morning. Article 15 of the EU directive dictates that member states must ensure that a system of inspections of all storage complexes is in place. The draft regulations will amend the Storage of Carbon Dioxide (Licensing etc) (Scotland) Regulations 2011, which came into force on 1 April this year, to include inspections. That will result in a system for checking in order to promote compliance with the directive, and for monitoring of the effects on the environment and on human health. The draft regulations also deal with inspectors' powers and duties, how often inspections should be carried out and how inspections should be reported.

I am glad that among the major parties in Scotland and across the UK there is political consensus on CCS. We aim to have consistent regulations UK-wide for CCS. The UK Government is making for England and Wales a similar amendment to the amendment to our 2011 regulations in order that it can include inspections such as we propose in the draft regulations.

The opportunities that are associated with CCS in coal and gas are vast. We must deliver on that potential. I am happy to answer any questions from the convener or other committee members.

The Convener: I was interested to hear from you and to read in our notes that the draft regulations relate to inspections of carbon dioxide storage complexes. As you said, the opportunity for storage in Scotland will primarily be where oil and gas reserves were located under the North Sea. Will you give us guidance on how such complexes might be inspected and regulated in practice?

Fergus Ewing: I can give clarification, at least generally. Marine Scotland will be the competent authority to ensure that the regulations are enforced. Inspections of the oil and gas sector are carried out by the Department of Energy and Climate Change's team of trained inspectors, who are accustomed to that environment. It is expected that an arrangement with the DECC to contract those inspectors on our behalf could be agreed. I hope that that answers in general your apposite question.

The Convener: I did not intend to get overly technical. Your clarification was helpful.

Chic Brodie (South Scotland) (SNP): Good morning, minister. I have no problem with the draft regulations; my question is more technical and is about the timing of inspections, particularly post-closure. Given recent circumstances in Fife, are you happy that five years is a short enough period after closure?

Fergus Ewing: It is fair to point out that a corpus of statutory instruments on carbon capture and storage has been introduced. I forget the exact number, but the figures 50, 60 and 70 come to mind. At the instigation of Russel Griggs's better regulation unit, the whole framework for carbon capture and storage in Scotland has been delivered. It is plain that we set the framework in place in the expectation that the Longannet project would go ahead. We wanted to be shovel-ready with the legal framework, but the subject is new and complicated: it all had to be done and it was done. The draft regulations are a relatively small—albeit important—part of that framework.

Annual inspections would begin within the first year of operation of a storage complex, which is known as the initial period. Three years after the injection activity is complete and the storage complex is closed, we will enter the post-closure period, during which inspections would be performed every five years. I mention that to allay the concern of Mr Brodie and colleagues that the regime would involve inspections more than five years apart.

A lot of preparatory work would be done prior to storage being undertaken—indeed, that will really be the critical time—to ensure that storage will be effective and that leakage, which has been given a lot of governmental consideration here and in the DECC, is properly taken care of. The efficacy and safety of storage of CO_2 will be properly dealt with and a lot of expertise will be deployed to ensure that that work is carried out properly. The annual inspections would begin within the first year of operation and the five-yearly inspections would begin in the post-closure period.

The inspection regime—which, as I said, is being implemented through counterpart regulations in the Westminster Government—is thought to be sufficient and appropriate. Of course, if expert advice in this new area for Scotland and Europe subsequently indicates that the regime will be less than robust and less than sufficient, I am sure that we will look at it again, guided by evidence and scientific advice.

My attention has just been drawn to paragraph 3 of article 15 of the directive—it had not reached my frontal lobe—which requires that inspections be carried out every five years from three years after closure of the site.

Stuart McMillan (West Scotland) (SNP): Good morning. I have a few quick questions. How many people would be needed to undertake an investigation? What additional training would be required to facilitate that work?

You said that Scotland has 50 per cent of the Europe's storage capacity. To what time period is it estimated that that will apply?

Fergus Ewing: I suppose the first question is to ask which project will go ahead. For various reasons—which it would not be helpful to rehearse here—Longannet is not going ahead. However, as members are aware, other projects in Scotland are being considered. It is probably wrong for me to talk about individual projects in committee, for reasons that are to do with the planning system.

The first stage of a carbon capture and storage project is called the FEED—front end engineering and design—stage, when the detailed scientific, technical and engineering work is done to consider whether a project is feasible. The combustion side and the transportation and storage side would be looked at.

Incidentally, each project will be massive for the economy. I am pleased that Scotland is still being seen in the EU as taking the lead on CCS. With the support of officials, Scottish Development International and Highlands and Islands Enterprise, I lobbied the European Commission in support of CCS projects at an engagement and at a seminar in Brussels in November.

In addition, I met Shell in Rotterdam two weeks ago to discuss the company's experience at Barendrecht, which was a proposed project that did not go ahead, partly because of fears among residents that CCS would be on land. It was rejected for a number of reasons, as were similar projects in Germany. That tends to indicate that the potential exists offshore. The preparatory work is massive and the projects would take several years to deliver. Funding of them is complex and difficult, particularly given that the carbon price is below £10 a tonne at the moment.

09:45

We are a long way from being able to answer with any precision questions of the nature of those which Stuart McMillan has quite fairly asked about training and timescales. I will be happy to get back to Mr McMillan with more detailed answers if that is in order, convener. The emphasis for us at the moment is on making the appropriate representations, with our colleagues in the DECC, to the EU to try to secure its support and, possibly, the support of the European Investment Bank, for example, for Scottish candidate projects, in order that Scotland can be at the forefront of CCS and so that we get the benefits from that. As far as I am aware, the projects are mostly relatively long-term projects.

The Convener: Members might recall that it is our intention to hear evidence from a minister from the Department of Energy and Climate Change in the near future, which will provide an opportunity to pursue some of the issues directly.

Angus MacDonald (Falkirk East) (SNP): This might be a "How long is a piece of string?" type question. You mentioned Peterhead and Longannet in your preamble. How many carbon capture complexes do you envisage will be required in Scotland to ensure that as much CCS as possible is undertaken? What would be the ideal number of such complexes?

Fergus Ewing: I do not know that we have made an assessment of that sort, because CCS is at a nascent stage in its application in the EU countries.

I will answer the question by looking at it in a different way. Mike Farley, who co-chairs the thermal generation energy sub-group with me, expressed the view at the seminar in Brussels that if the EU is to meet its emissions targets, a very large number—into the hundreds—of power stations in the EU will have to be fitted with CCS technology. If the EU is serious about meeting those targets, CCS becomes a sine qua non of achieving success. In other words: no CCS, no targets. Targets will not be met without CCS. That view was broadly confirmed by the International Energy Agency in its recent remarks, which I heard when I attended the transport, telecommunications and energy council a couple of weeks ago in Brussels, along with Charles Hendry. The lady who spoke for the IEA made the same point: because the large emitters' emissions are largely fixed, one can see that for the targets to be achieved CCS really has to be applied. The question is how best, working collaboratively across Europe, we can achieve that and how Scotland can be situated at the forefront of it.

We do not want to limit our ambitions, but the costs of applying the technology to existing power stations—retrofitting them—are not inconsiderable, which I think everyone would acknowledge was a factor in the Longannet decision. Peterhead is a gas-fired power station. I believe that it is the only candidate in the EU for CCS technology to be applied to an existing gas-fired power station. That makes it a strong candidate, in the sense that the experience that could be gained from applying the technology to it could be of great benefit in the necessary work of applying it to gas-fired power stations throughout the EU. As Angus MacDonald is well aware, there are other potential candidates. We do not want to rule anything out at the moment; as the minister, it would be wrong for me to do so, in any event.

If we are to achieve our targets, CCS is necessary. At the moment, with the financial difficulties that face Europe, the amount of investment that is required may make it difficult to achieve the targets, at least within the proposed timescale, unless CCS can perhaps be combined with enhanced oil or gas recovery, which would provide a second income stream. That, as they say, is another story.

The Convener: I am sure that the minister is comfortable answering questions on the broad range of policy on CCS, but I gently remind colleagues that we are looking at the statutory instrument, which is narrower in its focus on regulation.

Mike MacKenzie (Highlands and Islands) (SNP): Good morning, minister. Why were the powers not included in the original act? Given that the technology is new, are you satisfied that the inspection regime is sufficiently robust to allay public fears about it, but not so robust as to impede the progress and development of a project?

Fergus Ewing: I will take the second question first. I am satisfied that the inspection regime is appropriate. Plainly, I am satisfied on the basis of advice that I have received, as I am neither an expert nor a scientist. Ministers obviously rely on advice—otherwise we would be in a bit of a pickle. I am happy to accept the advice on that basis. The regulations are not a one-off; they are part of a large framework and corpus of work that many officials have spent a lot of time on in paving the way for a project that sadly did not go ahead. We would have been in a position to proceed with the Longannet CCS had the project been given the go-ahead, which is why so much work was put in and why so many Scottish statutory instruments have already been passed.

The regulations will implement article 15 of the European Union directive—no more and no less. They will not go further than that or gold plate it. I am sure that if they did they would attract questions from you, convener. I hope that that is a reasonable answer to Mike MacKenzie's questions.

John Wilson (Central Scotland) (SNP): Good morning, minister. There will clearly be financial implications in setting up the inspection regime. Has the Scottish Government worked out costs that may apply and how it intends either to recover or to pay for the costs of the inspection regime that is outlined in the regulations?

Fergus Ewing: The need for an inspection regime should not be cost driven. An inspection regime is necessary to ensure that a hugely significant activity is carried out appropriately. I expect the costs to be relatively insignificant compared with the overall costs of the project.

The inspection regime is a bit like health and safety legislation: we need to have it. A cost comes with it, but it is a cost that we cannot afford not to pay.

John Wilson: For clarification on the record, is it right that the Scottish Government will bear the cost of the inspection regime and that there will be no recovery of costs from the DECC or Europe?

Fergus Ewing: If there is a way to share costs with collaborative partners, we will find it. I repeat that, to me, the cost of the regime is not a factor of any great significance, at this point. Of far greater significance is the work to get projects off the ground.

The Convener: I will follow up that point. Given that the general approach to such matters seems to be based on the principle of full-cost recovery, one would assume that there would be some fee-charging mechanism to recover the costs from those who are being inspected.

Fergus Ewing: Stuart McKay may be able to fill us in on this point.

Stuart McKay (Scottish Government): The Scottish ministers are the competent authority in this case. Marine Scotland is carrying out the exercise on behalf of the Scottish ministers, so the costs will initially fall to the Scottish Government. We will seek to share those costs with the DECC, if that is possible. However, the majority of the cost of monitoring will lie with the operator; that cost is far greater than the inspection cost.

Rhoda Grant (Highlands and Islands) (Lab): It seems that the situation is similar to that in relation to health and safety legislation, in which the operator carries the main cost while the Government ensures that the operator is carrying out its obligations properly, which carries a smaller cost. Is that what you are saying?

Stuart McKay: The approach in the regulations mirrors that situation. In addition to the one-year and five-year inspections that are laid out in the regulations, there will be on-going monitoring control systems that operators will need to comply with daily. If those monitoring control systems indicate that there is a problem, inspectors can come in, in a non-routine way, and inspect the facility at any time. That would involve a small percentage of the cost of safety.

The Convener: There are no further questions from members. I thank the minister and his officials.

We move to the next item on the agenda, which is consideration of a motion on the regulations.

Motion moved,

That the Economy, Energy and Tourism Committee recommends that the Storage of Carbon Dioxide (Licensing etc.) (Scotland) Amendment Regulations 2011 be approved.—[*Fergus Ewing.*]

Motion agreed to.

The Convener: A short report to detail that outcome will be presented to the Parliament.

I thank the minister and his officials for their attendance. We will have a short suspension before the next item of business.

09:57

Meeting suspended.

10:01

On resuming—

Renewable Energy (Targets)

The Convener: Item 4 is a round-table evidence session on our proposed work to look at the achievement of the Scottish Government's renewable energy targets.

Before I ask the witnesses to introduce themselves, I will give some context to help both members and witnesses. We agreed earlier in the parliamentary session that the committee wanted to do some work, which will start in the new year, to look at the Scottish Government's renewable energy targets. I remind people that the proposal is that renewable sources will generate the equivalent of 100 per cent of Scotland's gross annual electricity consumption by 2020, with an interim milestone of 31 per cent by 2011, and that renewable sources will produce the equivalent of 11 per cent of Scotland's heat demand by 2020.

The evidence session is part of a scoping exercise to help committee members determine how far-reaching our inquiry should be. For example, the committee could focus narrowly on whether the targets are achievable and whether we are on target—forgive me for using that expression—to meet the target by 2020, or we could agree that we want to broaden the scope of the inquiry to include broader renewable energy issues, such as whether the targets are desirable and whether there are better ways to try to reduce carbon emissions.

The purpose of the evidence session is to get feedback from a range of interested parties involved in the debate, as that will help inform committee members when they reach a decision. We intend to run the evidence session on a relatively informal basis, given the large number of witnesses, and we want to allow a relatively free flow of information. It is not only about committee members questioning the witnesses; I would also like to see engagement between the witnesses. I am sure that there will be differences of opinion on various matters; indeed, knowing some of the people round the table, I think that there will probably be fairly strong differences of opinion, but that is fine.

I intend to allow about an hour and a half for the discussion. We will see how it goes thereafter. I invite each member of the panel to introduce themselves and say a little bit about themselves.

David Cunningham (Altium Securities): I have worked in the financial markets for about 20 years and I have worked in renewables and clean technologies for the past 11 years. I was the Extel-rated number 1 analyst in the sector in 2009, as

voted by my peer group, which is the financial community, so I have a reasonable understanding of all things renewables, whether it is wind, biomass, solar, hydro, run of river or marine renewables, and other technologies in the energy efficiency space. I have a good grounding in the area.

Dan Finch (EDPR UK): Good morning. I am the managing director of EDPR UK. I worked for 17 or 18 years for Scottish and Southern Energy in hydro power, and then I became its onshore and offshore construction manager. We then set up a small Scotland-based company called SeaEnergy, which sold out to Repsol.

Repsol and EDPR are large Spanish-Portuguese players in the offshore and utility market. EDPR is the third-largest wind developer in the world, but it did not have a base here until we decided to invest in the UK and in Scotland in particular. We have an office in Princes Street, along with our Repsol partners.

Colin Ormiston (Vattenfall Wind Power Ltd): I am a director of onshore development for Vattenfall, which is a Swedish energy utility and one of the six largest in Europe. It is 100 years old—it began its life as purely hydro, but it is now involved in wind, biomass, nuclear, coal and gas. We are interested in a mix of technologies. Our aim is similar to that of the Scottish Government, in that we want a sustainable, reliable and affordable energy mix. My role is primarily in onshore wind development, and I hope that we can address some of the planning issues today.

Professor Paul Mitchell (University of Aberdeen): I am from the University of Aberdeen, where I head up the institute of energy technologies. I am based in the school of engineering and I have worked in renewable energy for a long time. I was part of the team that set up the original bioenergy programme for the UK a long time ago.

I am on the Government's renewable energy advisory group and I am on the boards of Scottish Renewables, the Aberdeen Renewable Energy Group and the Scottish European Green Energy Centre. I am also on the directorate of the energy technology partnership, which involves a group of universities coming together to carry out research on energy-related issues.

Peter Atherton (Citigroup): Good morning. I am head of Citigroup's European utilities team of eight analysts who are based in London, Madrid and Milan. We cover 35 of the major European utilities. Our client market capitalisation is currently about €650 billion. I also co-ordinate Citigroup's global utilities coverage, which involves a team of around 35 analysts who are spread around the world. We currently cover around 250 stocks globally.

I have been an equity analyst since 1996; I have spent four years at Kleinwort Benson and 10 years at Citigroup. Before that, I worked for the National Grid in corporate strategy, where I negotiated the first round of dash-for-gas connection contracts for gas-fired power stations.

For the sake of my lawyers, I must say for the record that, as an equity analyst, my views are my own and do not necessarily represent the views of Citigroup.

Niall Stuart (Scottish Renewables): Good morning. I am chief executive of Scottish Renewables. We are the representative body for the industry in Scotland. We have more than 300 members in development and the supply chain, community groups and academic bodies such as universities and colleges.

Joe Philips (GL Garrad Hassan): I am the global head of practice for strategy and policy at GL Garrad Hassan, which is the world's largest renewable energy consultancy. I have a background in offshore wind engineering. We were responsible for the drafting of and underlying analysis for the report "The Power of Scotland Secured", which was sponsored by Friends of the Earth Scotland, the RSPB and WWF Scotland. Today I will speak on behalf of GL Garrad Hassan rather than those non-governmental organisations.

Helen McDade (John Muir Trust): Good morning. I am head of policy at the John Muir Trust, which is a charity that works to protect wild land and get people to value wild places. Some people have asked why we are involved in this debate. We have been gaining a lot of expertise: we get a lot of expert input on technical, electrical and generating matters from voluntary helpers. We needed that at the Beauly to Denny inquiry, as we realised at the start that we were not going to win simply by putting forward our landscape views. We needed to look at the targets, so we started looking at what was behind the targets and the assertions that were being made about what was required, and we gained a lot of expertise in that regard.

We supported the publication earlier this year of Stuart Young's report on intermittency issues and generation in 2009 and 2010, which was based on publicly available information. We are also involved in campaigning for a national—both UK and Scottish—energy strategy.

Felix Wright (Community Energy Scotland): Good morning. I work for Community Energy Scotland, which is a national Scottish charity that supports community groups that are seeking to develop renewable energy projects. We have a pipeline of about 200MW in renewable electricity

projects in development. I intend to give evidence in relation to the achievement of the 500MW community and local ownership target and on how that target might relate to the broader goals in the 2020 route map.

Professor Ian Arbon (Institution of Mechanical Engineers): Good morning. I am here in my capacity as the immediate past chairman of the energy, environment and sustainability group of the Institution of Mechanical Engineers. I was also the lead author of the recently published report, "Scottish Energy 2020?". My background is in the practical delivery of renewable energy systems, of which I have more than 37 years' experience covering practically every type of renewable energy. I am a visiting professor at Newcastle University and the University of Glasgow, and I teach at masters degree level the policies, politics and ethics of renewable energy. I look forward to the discussion.

The Convener: I thank all of you for coming along and helping the committee with its work. I will start with a general question to get things going. As you are well aware, targets have been set. I am interested in your perspectives on how achievable those targets are and what the major barriers are to our meeting them. That will lead us on to a range of other issues.

If you want to contribute, please catch my eye or put up your hand. Who would like to start?

Niall Stuart: I will start with the electricity target. It is not clear what installed capacity we would need to meet 100 per cent of annual demand. The report that we commissioned from Garrad Hassan said that anywhere between 12GW and 15GW would be required. We have almost 5GW in operation today and there are some 17GW in scoping and planning or under construction. Allied to what we already have, there are more than enough industry plans to take us up to the capacity that is needed to enable us to meet the 100 per cent target. We have always said that it is an ambitious but achievable target.

What are the barriers to our hitting that target? There are five or six key issues. The first is the uncertainty created by the electricity market reform process that the Government at Westminster is pursuing. I urge the committee to support our appeals for Whitehall to publish more detail on its plans. The second issue is the necessary grid infrastructure and the way that it is charged. The third issue is the skills requirement. If the industry is going to grow at the required rate, it will need thousands of new employees, so our schools, colleges, universities and training providers must be focused on delivering those employees.

The fourth issue is the need to get the right balance in the consenting framework between the need to preserve and conserve sensitive environments, both onshore and offshore, and the need to develop renewable energy in order to cut carbon emissions and tackle climate change. I will provide the committee with some information on planning, which I said that I would provide following my previous appearance before the committee and which is overdue. The fifth issue is the need for a more constructive public debate based on the facts and on the pros and cons not just of renewables but of all the energy options for Scotland.

The second question on the committee's briefing paper concerns the 11 per cent heat target. There is a clear need for an inquiry to flesh out some of the difficult questions on renewable heat, never mind some of the difficult answers. Heat constitutes 50 per cent of our energy use and accounts for around 50 per cent of Scotland's carbon emissions. Its cost is the main driver of fuel poverty in Scotland.

We do not have a good baseline of how much heat is used in Scotland and where it comes from. Future growth is not well understood, unlike the future growth of the electricity sector. There are also some difficult questions around trade-offs with other users of biomass and forest products. It will be valuable for the committee to focus on that issue, to flesh out some of the questions and hopefully find some answers to them.

10:15

The Convener: Thank you—that is helpful. Before I bring others in, I want to follow up on the electricity target. You mentioned renewables projects that are in planning. Can you give us a rough breakdown by technology, such as onshore wind, offshore wind, biomass, hydro and so on? How might the mix look by 2020?

Niall Stuart: Do you want to move on to other witnesses and then come back to me? I have a paper with all that detail in it.

The Convener: Yes, I will come back to you. Who else would like to come in on that question?

Professor Arbon: I agree with much of what Niall Stuart says about barriers. The fundamental flaw that the Institution of Mechanical Engineers perceives in the argument is that we are trying to reach an ill-defined target. Electricity consumption is measured not in gigawatts but in gigawatt hours, and they are not directly comparable units. The principal issue is that it does not matter how many gigawatts are installed—a gigawatt hour target can never be met with gigawatts of installed capacity. There is therefore a fundamental flaw in the

argument. That gap cannot be bridged, especially if people are not speaking the same language.

The Convener: You are straying into technical issues that committee members are reasonably familiar with but on which we are by no means experts. That is an interesting point and I will be interested in getting other panel members' take on that in due course.

Helen McDade: To follow on from what Professor Arbon said, it is not a technical matter: it is the basis of a lot of misunderstanding. I could not agree more with Niall Stuart that constructive debate on the facts would be useful. If your Scottish Parliament information centre briefing confuses megawatts and megawatt hours, you are not going to get very far. That is unfortunate.

We often hear that we now have the same capacity from wind as we have from hydro. We are talking about installed capacity, but performance is a completely different thing. The committee is going to have to get into all that in its inquiry, because all renewables are not the same.

Another part of the problem is how we talk about renewables. We do not talk about coal and gas as if they perform in the same way. Wind, biomass and hydro do not perform in the same way. It would be useful for the committee to get into those issues. The John Muir Trust wants to know whether there are better ways of achieving the renewables target than the way in which we are heading towards 2020 by concentrating on onshore wind. That is a key point.

I am not sure whether the committee's inquiry remit has been written yet, but I hope that it will look at how the renewables target relates to the greenhouse gas emissions targets. The primary targets are obviously the climate change targets, so I want the committee to consider whether achieving the renewables target in the way that we are currently going will achieve the greenhouse gas emissions targets that the Government has to meet.

Another question is about the current method's affordability. One issue is the intermittency of wind and its need for back-up generation. We have to look at what is base-load and what is not. The SPICe briefing has helpfully provided one thing: a quote from the Government that says that its vision is that Scotland will produce

"twice as much electricity as it consumes by 2020"

and that just under half of that will come from "conventional sources".

We need to ask what greenhouse gas emissions we will therefore have. It is quite a simple question, because if we are still using nearly as much from conventional sources, which is what Citigroup's report suggested, our reduction in conventional generation will be quite small compared with the huge expansion envisaged for wind. That is a key question that I hope you can take on board.

The Convener: The committee has not yet set the remit for its inquiry. Today's exercise is to help guide us on what the remit might be and how narrowly or broadly we should draw it.

Professor Paul Mitchell: I support much of what Niall Stuart said. I also agree that there is a lot of misinformation or misreporting of targets. People talk about gigawatt hours installed, gigawatts installed and how that is delivered. If the committee could elucidate that in a manner that everybody can understand, that would be a great help to us all. It is a bit confusing that the SPICe report that was appended to our documents addressed only the electricity target, rather than heat and, dare I say, transport, which does not seem to have been addressed so far. Transport is another major user of energy in Scotland and a great contributor to emissions. Those are issues that need to be thought through.

If the idea is that electricity becomes the means for generating energy for transport and heat, where will the additional electricity come from, what will that amount be and how do we balance it all? Those issues have not been resolved and, unfortunately, because of the turbulence and uncertainties set up by Westminster in the debate, we lose track of some of the solid arguments that it would be very helpful if the inquiry could elucidate.

Niall Stuart mentioned the heat target, particularly in relation to biomass and how that fits in. There is a very strong debate at the moment with the minister and with Westminster about the bioenergy targets and whether bioelectricity is an allowable subject for renewables obligation certificates. In England and Wales they have said categorically that that is one of their major planks for emissions reduction, yet in Scotland we have a policy that indicates, at the moment anyway, that large-scale deployment of bioelectricity is not on the agenda. That cascades down as, "What are the issues?"

Clearly, the forest products industry is a major player in terms of industry in Scotland; it is a utiliser of resource just as much as biomass heat, biomass electricity and even biomass fuels for transport may be in the future. I hope that the inquiry can delve down and see what the limitations are and whether the proposed cap of about 20MW for a bioelectricity plant—because that would not interfere with the forest products industry—is a sensible way forward, or whether we could up the limit, get a heat load on to that and provide some of the heat requirement from combined heat and power. The SPICe document

did not mention CHP, but if we are to have bioelectricity plants, we need the heat dimension on there as well. How does that fit into new building proposals? If we are to have new housing developments and new industrial estates, it would be ideal to make it mandatory for there to be a CHP system on the back of such developments. It would be quite useful to get all that out into the open.

The Convener: Thank you—that is very helpful. The one area that has not been brought into the mix yet is the question of transport emissions. We probably felt that that was outwith the scope of the inquiry, but your point about the move towards electricity as a power source for transport to a much greater extent raises a very important linkage. If we are to increase electricity output, there will be a demand for that to go into transport, as it will reduce the reliance on hydrocarbons. We need to consider that.

Peter Atherton: The biggest barriers will be in the capital markets and the financing of the investment. We looked at the situation on a pan-European basis, so it might be helpful for the committee if I give it some numbers about what it all means.

We produced a report back in October 2009 entitled "The €1 Trillion Decade". We added up what all the renewables targets and other environmentally driven targets were going to cost the utility sector in Europe over the next 10 years, together with the on-going investment that the sector needs to make just to keep the lights on, the water flowing, the gas flowing and so on. We came up with the nice round number of €1 trillion—it was actually €960 billion. Interestingly, the European Commission has now started calling it the trillion euro decade. The UK has the biggest share of that €1 trillion at about €360 billion. The cause of that is largely our signing up to the renewables target and our inability to build onshore and having to do most of it offshore.

The numbers have moved around a little bit since then. Germany's decision to phase out solar has increased its number and the use of biomass in the UK may bring our number down a bit. I will give the committee a sense of the size of the figures. The European utility sector needs to invest roughly €90 billion to €95 billion a year for the next decade. The average investment rate of the sector through the 10 years from 1998 to 2008 was €32 billion. The combined investment of the euro stock 600—the 600 biggest companies in Europe—is about €350 billion a year. So, the European utility sector is being asked to triple its long-term investment rate. It has got its investment rate up to about €50 billion, which probably accounts for about 25 per cent of all capital investment in Europe.

If the sector was booming, with share prices at record levels and investors falling over themselves to provide capital to the sector, we might think that the numbers that I described were achievable. In fact, the absolute opposite has happened. The sector has been de-rated by 33 per cent relative to the wider market and the dividend yield has risen from below the market average to 160 per cent of the market average. That means that investors are demanding their money back in dividends because they do not trust the big capital expenditure programme that the sector has been driven into. If they did trust it, they would be happy for dividends to fall, because they would get their returns through future capital growth. As we noted recently, the capital markets have provided a vote of no confidence in the sector and the huge capital programme in particular. What the capital markets and my client base are particularly focused on is affordability. Basically, investors have done the calculations and said, "If you build all this stuff, we don't believe that you're going to honour your commitments to the investing community because we don't believe that you're going to let power prices rise that far and that fast to pay for it all. We just don't believe it." The capital markets are providing a very big brake at the moment.

The UK Government has reacted to that with the electricity market review. The whole purpose of the EMR is to transfer risk from the renewables developers to the consumer. The idea is to allow the European utilities to do more for their current balance sheet and to bring in additional investors from outside the normal pot. That may or may not work. We have our doubts about whether it will work sufficiently.

That gives the committee some idea of the pan-European debate on affordability and balance sheets within the capital markets.

The Convener: That is very helpful. Mr Brodie has a question for clarification.

Chic Brodie: We will come to some of the issues in your report of 1 November later on, Mr Atherton, but according to it:

> "Citigroup Global Markets ... or its affiliates beneficially owns 1% or more of any class of common equity securities of Iberdrola ... Within the past 12 months, Citigroup ... or its affiliates has acted as manager or co-manager of an offering of securities of Iberdrola ... Citigroup Global Markets ... or its affiliates has received compensation for investment ... services ... from Iberdrola ... National Grid ... Citigroup Global Markets ... or its affiliates expects to receive or intends to seek ... compensation for investment banking services ... Citigroup Global Markets ... or an affiliate received compensation for products and services other than investment banking services from Centrica ... Iberdrola ... National Grid".

You have just told us that people are not confident about investing in energy companies, but the

company that you work for and for which you produced the report is doing just that.

10:30

Peter Atherton: I am sorry—is there a question there?

Chic Brodie: Can you explain why you said what you did, even though your own company is doing the opposite?

Peter Atherton: Let me explain the role of an equity analyst. Although they sit within Citigroup's Global Markets division, they have a very separate function and are legally ring fenced from the rest of the bank. I am not a banker; equity analysts provide a research service to their client base—institutional investors—and produce buy, sell and hold recommendations based on stocks.

Chic Brodie: But you have not answered the question—

Peter Atherton: I am sorry—I am answering your question. I am highlighting my role within Citigroup, which is the fourth largest global bank by market capitalisation and assets and has dozen of divisions. I have colleagues throughout Citigroup who provide banking services to probably every large and most of the smaller corporates in the world.

Chic Brodie: So Citigroup Global Markets has no consistent strategy with regard to the renewables industry.

Peter Atherton: My banking colleagues do not consult me on their activities—

Chic Brodie: Clearly not.

Peter Atherton: —and I certainly do not consult them on my research and recommendations. It would be illegal for us to do so.

The Convener: I think that that is understood. You are a market analyst and Citigroup's banking operations are legally separate from what you do.

Peter Atherton: That is correct.

Joe Philips: Given the amount of misinformation going round about intermittency—or, I should say, variability—and the fact that it is often used as a key criticism of renewables and a key barrier to their widescale deployment, I think that it is important to put it into the Scottish context.

First, there is no such thing as the Scottish electricity system; it is part of the broader Great Britain electricity system. Indeed, it is already reasonably strongly connected to England and investment plans over the next few years indicate that the connection will be considerably strengthened. Scotland contributes roughly 10 per cent of the overall GB demand and supply and our analysis indicates that if the plans for strengthening interconnection between Scotland, England and Wales go ahead as planned over the next decade there is no technical reason why Scotland cannot have only renewable generation sources. That makes sense because, as we all know, Scotland is blessed with the best resources in the UK.

The situation is similar in Spain and Portugal, which have an integrated electricity market and are, from a grid point of view, well connected to each other but weakly connected to the rest of the European electricity system. The fact that, last month in Spain, wind was producing 59 per cent of instantaneous electricity demand for several hours overnight indicates that a system like the one in GB that is relatively weakly connected to the rest of Europe can live with much higher levels of wind penetration without substantial requirement for additional back-up generation. With regard to variability, intermittency and the requirement for back-up power supply, I urge the committee to think about the GB electricity system as a whole rather than Scotland in isolation.

The Convener: That is helpful.

I think that Mr Finch caught my eye to speak next.

Dan Finch: I do not want to comment specifically on the targets; rather, I would like to comment on behalf of the companies that I represent: EDPR-Repsol. EDPR is a utility resource-based company and we operate 7,000 turbines worldwide. As I said before, we are the third largest wind developer in the world, and our partner is the Repsol oil and gas company. We are resource companies that go where the best and most appropriate resources are, which is why we have the confidence to invest in the UK, and particularly in Scotland, where we have based ourselves. We plan to develop or are developing around 2,500MW of offshore wind in Scottish waters.

We picked Scotland for the straightforward reason that it has a phenomenal wind resource. I worked for many years in hydro power and understand how it works and the intermittency that there is in some hydro power areas, as there is with wind power to some degree. However, we simply have to look at the capacity factors or the amount of load that wind farms in the north of the UK take, which is significantly greater than anywhere else in Europe. It is where the resource is and it is the place to go if you want to develop renewables to any scale.

That does not diminish at all the challenges that we face. As Niall Stuart intimated, we are out on a limb, if you like, on the edge of the strong grid. We

also have finance challenges. The financing of the projects will ultimately determine whether we will be successful in delivering them and meeting the targets. To reiterate one or two comments that have been made, meeting the financial requirements will be determined by things such as whether there is sufficient resource and whether the cost base can be reduced. We fully understand those challenges and are prepared to invest serious capital at this stage, at risk, to try to develop Scotland's wind capacity.

I will answer a question about intermittency. A 1,000MW wind farm at sea—I am not commenting on onshore wind, but on wind farms off the coast—should produce the equivalent of what is produced by the hydro power stations that are currently based onshore. It is not correct to say that their production is intermittent or that they will not contribute a significant number of megawatt hours. The wind farm with the largest output in Europe is based on Shetland and, although it is a very small wind farm, it has a huge capacity factor.

The Convener: I want to be clear. Is it fair to say that, over the piece, offshore wind is more productive than onshore wind?

Dan Finch: I have to be careful about saying that because, as I said, the onshore wind farms in the north of the country produce a significant amount of power. An onshore wind farm in the north of the UK probably produces as much as an offshore wind farm in the south that is close to the shore. We have come from Spain and Portugal to invest in the UK because the UK—and Scotland in particular—is the key market for offshore wind. Germany recently changed the way in which it will incentivise and remove some of the key risks such as grid risks to some degree from developers who are prepared to invest there. However, until very recently, the UK was the key market in which to invest in offshore wind, which is why we, Vattenfall, Scottish Power and Scottish and Southern Energy have key interests here.

David Cunningham: I will pick up on the capital markets perspective. This year—2011—is likely to be a record year for investment in renewables globally, which might seem strange in view of the backdrop to which we are currently exposed, with the lack of credit and most western economies going into a second recession. There is an active market, but the level of investment that is being sought, particularly in the UK, is around a fivefold increase on historical levels. In addition, the offshore wind targets mean that we are relying on offshore wind to deliver the silver bullet that gets us to a low-carbon economy. If you look at the operational data that is available from existing offshore wind farms, you will see that information is not widely available to the public. Most of it is held tightly by the utilities, and most banks and financial investors will not support offshore wind developments until there is detailed and thorough engineering analysis of the performance characteristics of those offshore wind farms.

Similarly, from an engineering perspective, most of the top six turbine manufacturers in the world do not have operational data from offshore wind farms in deep water on the wind characteristics of turbines at the relevant hub height. That is the basis for an energy yield prediction on a wind farm's performance and revenues, so the financier has a heavy element of risk attached to putting money into an offshore wind development.

The targets for onshore wind are deliverable. The market in that is active and the internal rates of return are suitably attractive, even with a 0.9 ROC. However, the aim of hitting about 10GW of offshore wind in Scotland is an aspiration. The utilities that have offshore wind farms are hitting significant engineering issues, particularly on the operating expenditure side, and some failures in the design of structures.

Scotland undoubtedly has the expertise for offshore wind. We have that in the oil and gas industry and we have the subsea structures, the fabrication yards and the engineering skills. Scotland is the obvious place. Dogger Bank is one of the furthest afield offshore wind farms and is in shallower waters. The Moray Firth and Firth of Forth offshore wind licences are for areas near the shore that involve deeper waters. There is a balance between the two aspects. When we take all matters into consideration, Scotland has an advantage.

If we truly want to hit the targets in the onshore wind market, we need to change planning legislation for consenting to wind farms. We need to take a far more belligerent approach to tackling and meeting the targets by delivering onshore wind. In lightly populated areas of the west of Scotland, such as some of the islands, the capacity factors are more than 50 per cent. That is higher than the factors in the offshore wind industry, for a third of the cost of offshore wind. We should address such matters, rather than something that is aspirational at the moment. Offshore wind is being back-end loaded to hit the 2020 targets. Most utilities are three years away from doing anything meaningful—from having rotor blades turning significantly.

I concur completely with the Scottish Government's approach to large-scale biomass combustion. People cannot get a long-term feedstock contract with a deliverable and definable price for their wood. Small-scale biomass is the right thing. The target of 11 per cent renewable heat in the overall mix will be very difficult to hit and I am not sure how we can deliver it.

The Convener: As we have talked about offshore wind, I will ask a question about something on relative costs that I picked up from Mr Atherton's Citigroup report. He makes the point—I ask him to clarify it if I misinterpret him—that Scottish offshore wind is likely to be much more expensive to develop than English offshore wind. Do you agree?

David Cunningham: The point relates to Dogger Bank, which is far offshore and involves shallow water. The minimum depth in the Moray Firth and the Firth of Forth is about 45m. A balance is involved. We think that the wind capacity is higher, although no one has measured the wind data at the relevant hub height offshore. We understand from Met Office data that wind speeds and capacity factors are richer in Scottish waters than in English waters. On balance, the figures are probably broadly similar. However, my view is not backed by any engineering information. That is a big aspect that it is probably important for members to understand.

When an onshore wind farm is built, a met mast is put up. It collects the data and generally does so at the hub height at which turbines will be situated. That has never been done offshore, so we have no way of fully understanding the wind characteristics. The deliverability of hitting the carbon targets to 2020 through using offshore wind is highly unpredictable and is a very high risk, particularly from an equity and debt perspective.

The Convener: That is very interesting. I am interested in hearing comments from other members or witnesses on offshore wind, which is important.

Chic Brodie: Can I just—

The Convener: Hold on—other members caught my eye first.

10:45

Mike MacKenzie: In relation to what you just said, Mr Cunningham, have you ever been west of Tiree on a typical day like today when there is a wee bit of a breeze here?

David Cunningham: No, not Tiree. I know that it is very flat.

Mike MacKenzie: Would you accept it from me that if you were on the island of Tiree today you would have great difficulty standing upright?

David Cunningham: I completely agree. My personal view—it is not the bank's view—is that the thing to do is to turn some of the Western Isles into an urban wind farm. We can hit 6GW to 15GW of onshore wind on some of the islands. It is very definable. The islands have a low population density and we would hit our targets quickly. You can get industry to come here and you can have turbines made here. The grid connection issues are simpler because you can use high-voltage direct current and cabling and sink the cables in the sea. We no longer have the same planning issues. To me, that is the way to approach it.

In the next eight years, the Chinese will install renewable capacity equivalent to—and probably exceeding—the size of the entire Italian installed capacity. In the past five years, China has consistently beaten its targets—it has doubled them and on some occasions it has tripled them, particularly in wind. China has done that not because it believes in climate change but because it believes in energy security. That is the way in which we have to approach the issue.

The method that we use, which is to try to go through the planning issues with local authorities and interested parties, which have their own interests in the mechanism, will not deliver the targets. We need to stick to the fundamentals. Where is the lowest-cost source of energy located? It is in this area. Is this area densely populated? No, it is not. Does it have a significant footfall of native flora and fauna? No, it does not. Then that is the obvious place to locate onshore wind in order to meet the renewable targets and decarbonise our activities.

Joe Philips: The engineering challenge for offshore wind to happen in Scotland is obviously a key concern, but some of Mr Cunningham's points need to be challenged, particularly with respect to the understanding of wind resource. I am speaking as someone who has delivered a significant amount of engineering analysis and studies of the wind resource over the past eight years or so.

It is not true to say that there are no offshore wind measurements, although it is true that there are currently not many off Scotland. However, there are some offshore wind measurements, and that evidence indicates that the wind climate here is not substantially different in character from the German bight region, where significant quantities of offshore wind are currently being deployed.

It is inaccurate to suggest that we are going into uncharted waters from an engineering perspective. There is about 2GW of offshore wind in construction in the UK. It is an industry that is happening. There are and will be technical challenges but those challenges are incremental. We are going incrementally into deeper waters and harsher wind climates. There is no reason why the engineering companies involved in the industry, including mine, cannot bring forward the solutions to address those challenges.

As to the investment climate and whether technical challenges will put off the investment

community, it is worth looking at recent examples in Germany, where the first fully project financed—debt financed—projects in the order of 200MW to 400MW are coming through. Furthermore, private equity is now putting money in to fund offshore wind farms in Germany. It is inaccurate to say that there is no precedent and that the financiers will baulk at the challenge. That is counter to the evidence that we are seeing in Germany and in England.

Colin Ormiston: I want to pick up on a few issues. There has been a lot of talk about the investment from specific utilities. Obviously, Sweden is a big utility, which sees investment in offshore and onshore as equally important.

Offshore development is high risk and takes a lot of investment. We are joining a consortium with Scottish Power to build one of the biggest developments off the English coast, which is 7.5GW.

Another point about offshore is that there are supply chain issues that need to be examined. We are involved in the European offshore wind development centre, the whole point of which is to look at some of the supply chain issues in developments with larger turbines in order to bring down costs while still siting developments relatively close to shore. There are plans in place to address some of those issues.

As I said at the outset, onshore also has a role to play. I know that in the countries where Sweden is working—Germany, Denmark, the UK and the Netherlands—it sees the potential, moving towards 2020, for onshore development to be equal to that of offshore. We have to realise that offshore will deliver but, to some extent, it is slightly behind and onshore still has a role to play.

I have to challenge Peter Atherton. I do not want to misquote him, but I think that he said something about the difficulty in developing onshore. It is still possible to develop onshore. There are still sites available and there is still work to do. That picks up Niall Stuart's point that there are grid issues to address and planning needs to be addressed.

One of the key issues that we need to discuss today is the cost of energy. One way of driving down the cost of energy is to look at some of the more at-the-market, developed technologies, which is why we are talking about wind. Onshore wind is one technology that is of the lowest-order cost. There have been reports that, by 2016, the costs are likely to be in line with those of other technologies.

We should celebrate how far we have come. Scotland has done very well. Investors are here because of positive policies. We should recognise that we have done very well, but there is still more to do.

The Convener: Specifically on offshore wind, Chic Brodie, Niall Stuart, Peter Atherton and David Cunningham want to come in. I invite brief comments.

Chic Brodie: In Altium's report—I am sure that this includes offshore wind—it says that Scotland's potential is to be the lowest-cost generator of wind energy in Europe. I would have thought that that has to include offshore wind energy. We are concentrating a lot on wind. We have not talked about wave power, tidal power and the balanced energy policy. This is not for today, but we have not even talked about demand. We are talking about supply, not demand.

Do you have any comments on developments outwith the wind element of supply?

The Convener: Can we park that for the moment? I am anxious to bring in others before we leave the discussion on offshore wind.

Niall Stuart: I want to make three comments, the first of which relates to development in the Western Isles and the other island groups. One of the main barriers, if not the main barrier, is the exorbitant grid charges that developers are being quoted in those places. That is the main barrier to onshore wind development going ahead, but it is also a significant barrier to wave and tidal developments going ahead in the future.

On offshore wind in particular, the Scottish projects are potentially further from shore in deeper water. That might mean higher capital costs, but with a better wind regime it can mean lower costs per megawatt hour. Those projects will go ahead only if developers are confident that they can produce power at a competitive price that can be traded in the Great Britain market and that those projects can compete with projects in other parts of the UK.

One way in which we can ensure that investment comes to Scotland is getting the consent regime right and getting people into it earlier than in other parts of the UK to give investors the early option to come to Scotland.

From conversations that I have had with SSE, Mainstream, Repsol and EDPR—all developers offshore in Scotland—I know that they are all extremely committed to taking their projects forward.

Despite what has been said, finance is not an issue that is raised with us. The issues that are raised with us are the ones that I have already touched on—uncertainty over the impact of market reform, uncertainty over grid connections and their cost, and questions over the development of the supply chain.

We have not yet mentioned a big advantage in Scotland—the legacy of the past 40 years of our

oil and gas industry. We have a skill set and technical expertise that other parts of the United Kingdom do not have.

The Convener: I will invite Mr Atherton to comment next, and then Mr Cunningham, because we have discussed investment a lot. Perhaps you could also pick up on Mr Brodie's point about where investment in other technologies is heading.

Peter Atherton: I cannot really comment on the latter point. None of the companies that we cover has yet come forward with particular projects in tidal or marine energy, so we have not taken a detailed look at it.

The point that I had wanted to make, convener, was just a slight clarification on your original point, but it was a long time ago now, so I will not bother.

David Cunningham: I wanted to make a point about German offshore, just so that the committee is fully briefed. Currently, the German market has about 22GW of onshore wind capacity installed. They are nearly at saturation point, so offshore is the next place to go.

The wind regime in Germany is very poor compared with Scotland, the western parts of Wales, and Ireland. In Germany, there is a feed-in tariff, which is a fixed-payment scheme that was recently upped for offshore wind. I have seen some data for an offshore wind development in the German North Sea, and the IRRs that an investor would get are about 15 or 16 per cent. That is sufficient to attract inward investment, but I can get 15 or 16 per cent IRR right now on onshore wind. A higher return will be required to entice investors to come into offshore wind. From an investor's point of view, the German market is different from the UK market.

Grid issues can be resolved if we have scale and capacity. On the Western Isles issue—if we want to make an issue out of it—costs can be minimised if there is sufficient scale.

Mike MacKenzie: Does Mr Atherton agree that markets sometimes get it wrong—sometimes spectacularly wrong, and sometimes disastrously wrong—and that investment banks can be prone to that as well? There is a global shortage of energy, and that will be an increasing problem, so does he agree that investment in energy is a bit of a no-brainer?

Could the market be talked down? When share prices went very low, then—bang!—you could invest at that point. Does Mr Atherton agree that that would be a really good investment strategy?

Peter Atherton: To answer both parts of the first question—yes and yes. In answer to your second question, that would be illegal.

Mike MacKenzie: Indeed, yes. Thank you.

The Convener: I want to bring in Dan Finch and Helen McDade. Also, Mr Wright has been extremely patient, and I will come back to him. Stuart McMillan wants to come in, too.

Dan Finch: I have a quick point on comparing ourselves with the German market, and I will add to what David Cunningham mentioned a few minutes ago. I will also return to a point that was made previously about wind and wind measurement in and around Scottish waters.

Partly with funding from the Department of Trade and Industry—as it was in those days—and from the Scottish Government, we built our Beatrice demonstrator turbine in the Moray Firth. Two turbines have been operating in the Moray Firth since 2006-07. They show us that the wind yield in that area would have a capacity factor of around 50 per cent before losses. We therefore do indeed have some wind measurement in Scottish waters, and we are confident that the wind resource is huge, as most committee members know.

The German Government has been very proactive in encouraging offshore—as it was with onshore wind, initially. There may be a lesson there for the UK Government and the Scottish Government: if we do not move quickly enough, and if we are not progressive with our consenting regime, for example, we are likely to lose out to other markets. The money and the developers will go elsewhere, and most of us are large international companies.

11:00

The German Government put wind measurement equipment out in the North Sea at its own cost, on platforms that were designed specifically in the expectation of huge offshore wave, tidal and wind developments in the future. Those platforms—FINO 1 and FINO 2—have been out there for many years, measuring the wind in the expectation that developers will come along in the future. The German Government then managed the grid issues by insisting in legislation that the grid company would connect to those wind farms to achieve the appropriate grid connection and take that risk out of the market. Recently, mainly, it has also stabilised the tariff system so that another level of uncertainty is removed from the developer's list of risks, which is significant and includes technical risks, which we have discussed before. The German Government is also succeeding in encouraging suppliers to invest in Germany, which it has always been able to do.

So, another risk for us in Scotland is that, if we are not seen to be fairly early movers, being proactive and de-risking the projects as much as possible, early investment from suppliers—hence

local jobs, local content, et cetera—will go elsewhere.

Peter Atherton: David Cunningham may correct me if these numbers are slightly wrong. The feed-in tariff subsidy in Germany this year is €18 billion. That is an €18 billion surcharge on Germany electricity bills to pay for the feed-in tariffs, which will, according to official estimates, rise to €26 billion by 2016. The two worst-performing European utilities—of a very bad bunch—in the past three years have been E.ON and RWE npower. The day before yesterday, RWE launched an emergency rights issue of €2.5 billion and it also has an €11 billion emergency disposal programme to get its balance sheet back into good shape. Were those numbers right, David?

David Cunningham: Yes. Just to—

The Convener: Hold on a second. Before I let Mr Cunningham in, please explain the point that you are making, Mr Atherton, in citing those statistics.

Peter Atherton: One or two people around the table are holding up Germany as a great example of the way forward, which it may well be in many measures, but I am telling you how much that is costing. It is currently costing the German consumers €18 billion on top of their electricity bills. Let me put that in context. The total electricity revenue in the UK is £32 billion. If we did the same as Germany, that would add €18 billion to £32 billion. I do not know what the total German electricity bill is, but I would guess that it is probably about €45 billion.

The Convener: So, it is a very substantial proportion of the total.

Peter Atherton: Yes. RWE told me recently—I have not checked this number—that solar energy in Germany this year will provide 1.75 per cent of the electricity and cost 15 per cent of the bill. I have not verified that number, but it sounds about right.

The Convener: Okay, we get the point. Things are happening in Germany, but subject to a very large subsidy.

Peter Atherton: Correct.

The Convener: Mr Cunningham, do you want to comment on that briefly?

David Cunningham: I will make just a couple of points. Those numbers are accurate. The German consumer has a surcharge on their utility bill of about 17 per cent, which accounts for renewables. However, the utility bill for a German consumer is lower than that for a consumer in the UK, even though Germany has much more solar and wind power in its current energy mix than we have in ours. The principal reason for that is that we have a substantial exposure to gas, and the price of gas has more than doubled in the past two years. That is why our utility bills are high; it has little to do with renewables at the moment.

The Convener: Helen McDade has been very patient.

Helen McDade: I will pick up on a few points that have been made round the table. There is a real risk of asking the wrong questions. Nothing that anybody has said round the table is incorrect. That may sound surprising, since several of us have said very different things. We must recognise the questions that need to be asked. We are talking about a lot of public money, and the question whether Scotland has the best wind resource in Europe is not the point. I can believe that Scotland has the best wind resource in Europe; the real questions are about how much wind energy we can usefully feed into our system and afford and what that gets us in greenhouse gas emissions reductions. There is a huge risk that we could spend a lot of public money on wind power only to turn around at the end and ask why our greenhouse gas emissions have not been reduced and why we still need conventional generation.

We have spent a lot of time talking about the specifics of whether it is better to trash onshore, because it is too expensive to build offshore, and all the debate has been about wind. As Mr Brodie suggested, we should be talking about other generation methods.

The Convener: To be fair, we can come on to that.

Helen McDade: I will come to a few other points that have been mentioned. The cost of the grid has to be met from the public purse. That must be taken into account when people say that it would be worth developing wind farms—I think that the phrase “urbanising the Western Isles” was used—so long as somebody else picks up the tab for the grid. We are still part of the UK, and all UK consumers will pick up the tab.

It has been said that planning constraints are the reason why a lot of developments have not gone forward. I will give you two reasons why that is not entirely true. Last year, Scotland approved 100 per cent of large onshore wind developments—I believe that the Scottish Government consented to all of the big ones. Another example is the Griffin wind farm. It was consented in January 2008, but it started being built only this year, when the European Investment Bank invested money in SSE for six projects.

The issue is absolutely about the finance. People are coming to Scotland not because we have the best wind in the world—I do not know

whether we do or not—but because there is a lot of public money available. Politicians, even if they are in Scotland and the decision is a UK one, need to look at the overarching question of whether consumer money should be going into such developments or whether we would get a better return on energy conservation and genuinely innovative research and development into other renewables, which have not been discussed today.

The Convener: Thank you.

Mr Wright, you have been extremely patient.

Felix Wright: That is all right—it has been an interesting discussion.

The first thing to say on behalf of Community Energy Scotland is that we welcome the ambition of the 2020 route map because to get anywhere on the issue we need the Government to show leadership. We also welcome the attempt at an integrated approach, so I second what Helen McDade just said: we cannot just focus on the supply. A supply-led approach will fail, so we need to look at demand management and at heat as well as at electricity. The 2020 route map is an attempt to do that.

The question was whether the route map is achievable. There are two dimensions to the answer, but they both come back to the question of how integrated we can be in delivering the policy. One dimension is technical, and we have heard some of the ins and outs of that. How quickly can we build the infrastructure? Is it possible to integrate a higher proportion of renewables into the current grid infrastructure? However, I will leave that aside as I think that the big question is on the social side: can we get the public behind the targets?

If we do not have the public on board, I do not think that the targets are achievable—and that relates to all the points that have been raised. For example, the 100 per cent renewable electricity demand equivalent target is intimately related to our demand. If demand continues to increase, the target will be increasingly unachievable. If we can rein in demand and either cap it or start to bring it down, the target becomes more realistic. The only successful way of managing demand is engagement with people and behaviour change. Unless we achieve that, I do not think that the other measures will succeed.

Similarly, having a stable incentive regime comes back to public support. If people do not see that renewables are delivering benefits to them either directly or indirectly, they will not vote for policies that add to their electricity bills.

The same is true with planning: we will not see a higher consent rate without public support. Helen McDade mentioned the 100 per cent consent rate for large developments, but if we include small-scale proposals the rate is more like 50 per cent overall. That is too high a hurdle to overcome if we want to build the infrastructure quickly. It reflects high uncertainty among the public about projects that impinge on their local environment.

We can also see the public engagement issue with intermittency. We need better consumer demand management to time demand better when renewables are generating. Approaching the issue with the existing framework and the desire to have something that acts like a coal plant will not work; we need behaviour change, too.

Having the public on board also relates to finance. There is a massive, untapped resource in pension funds and savings accounts that is currently not going into new renewable infrastructure. That ties into the question of who benefits.

I am sorry for labouring this, but I want to drive home the point that we need to have the social side on board. Although the inclusion of the 500MW target for community or local ownership, which I very much welcome, reflects moves in that direction, we will need to have dedicated policy measures in place if we are to achieve it. Some of those will overlap with UK-wide stuff that has already been discussed, but some of them will be specific to the local and community energy sector and relate to continuity of support from the Scottish Government. We welcome the support that has been put in place, but it needs to continue. We also need planning reform for small-scale projects; the approach that is taken by local authorities is too inconsistent and we need central Government to provide some guidance in that regard.

The Convener: That was very helpful.

Three members—Stuart McMillan, Mike MacKenzie and Rhoda Grant—want to comment.

Stuart McMillan: I have a few points to make and questions to ask. It would be useful if the committee could get some more information in writing after today's meeting. On page 8 of the shorter report that Mr Atherton submitted, he refers to Holland, Denmark, Poland and Austria. It would be useful to get more information on the current energy breakdown for each of those countries. Would that be feasible?

Peter Atherton: I guess so. We were just pointing out that if Germany needs to source renewable energy from outside its borders a lot of surrounding countries can probably provide it more conveniently than northern Britain can. Are you looking for data on the build-out of renewables in those countries?

Stuart McMillan: I am looking for a breakdown of all energy generation in those four countries.

Peter Atherton: I can very easily point you to some useful websites where you can get that information but we, too, can provide it.

Stuart McMillan: Given what we are looking at, it would also be useful to get some information about energy generation in some of the smaller European nations. It would certainly give us some background information for the work that we want to carry out.

At about 10:35, Mr Finch said that Scotland has a phenomenal wind resource and that it is the place to go for such resources. Prior to this year's election, you and your company would have known that the Scottish National Party wanted to hold a referendum on independence and, since May, we have known that the referendum will take place in the second half of this parliamentary session. However, your company still wants to invest in Scotland. Why?

Dan Finch: It is not my position to comment on the referendum or independence—

The Convener: We could be in for a long session if we get too much into the issue, but it is a fair question to ask.

Dan Finch: Steering quite clear of my—or indeed our—opinion on independence or the referendum, I am happy to say that we came here to centralise our offices in Scotland and, like our partner Repsol, to use Edinburgh as our UK base. We are investing significant amounts of at-risk money during the development process. Just to give members a sense of the magnitude that we are talking about, I point out that it will probably cost us in excess of £40 million to go through the consenting process for offshore renewables in Scotland. You can take it from that that we are still committed to developing that at-risk money and our decision to build will depend on the consenting process, the grid issues that we discussed earlier, and the ability to get financing. We were confident about coming here in the first place; we are continuing to develop; and we will make the key decisions about whether to invest £4 billion or £5 billion in Scotland in two to three years' time when, I hope, we will have consent.

11:15

Stuart McMillan: Even though the referendum will happen, it has not so far stopped your company from investing.

Dan Finch: We will have gone into the consenting process and might even be out of it by the time that that decision may have been made. We will decide on our investment at that stage.

Stuart McMillan: I posed the question because of your previous comments and some of the comments about investment in Mr Atherton's report.

I have a question for Mr Atherton. Which companies have indicated to you or your company that they will not invest in Scotland as a result of the independence referendum?

Peter Atherton: None. We did not say that they had and we did not ask anybody not to invest in Scotland. We said that people should show caution, because the chance that Scotland could secede from the United Kingdom creates an asset risk—which it clearly does—and the referendum creates a degree of uncertainty.

We have just written a report for the utilities sector that highlights the uncertainty created by the French presidential election. We also did a report ahead of the recent Spanish general election about the risks and uncertainty created by that election. Elections create risk and uncertainty, but the degree of that risk and uncertainty will vary greatly from sector to sector and from election to election. It is preposterous to suggest that Scotland holding a referendum on whether to stay in the United Kingdom carries no uncertainty and no risk for particular sectors.

Stuart McMillan: You said that elections create uncertainty.

Peter Atherton: Sure.

Stuart McMillan: That impacts on every country.

Peter Atherton: It depends on what the issues are in the election. For example, in the French election that I mentioned, the Socialist Party is suggesting that it might go to a less nuclear intensive electricity system. That obviously creates a degree of risk and uncertainty for EDF, which is one of the companies that we cover, hence we have highlighted the issue.

As far as Scotland is concerned, the important issue for the utilities sector and the renewables sector is what happens to the subsidy mechanism. It is currently ROCs, but by the time that there is a referendum it might be changed to a system based on contracts for difference. The issue is what happens to the subsidy mechanism and whether there is a legal pathway for it to be maintained for both existing assets and new assets. As we speak, no pathway has been agreed and set out in legislation to enable the mechanism to continue.

On Dan Finch's point about financing things, the key issue is financing and the key aspect of that is the subsidy mechanism. Two thirds of your revenue from offshore and half your revenue from onshore comes from the subsidy mechanism, so

the subsidy mechanism is the most important thing for investors. You need a 100 per cent guarantee, or as close to 100 per cent as you can possibly get, that the subsidy mechanism will pay you for the payback period of the project, which will be eight to 12 years. You need to have an absolute guarantee that the subsidy mechanism is in place with a credible counterparty.

Stuart McMillan: On financing, we must certainly consider the UK and we must consider energy provision. The UK state would have had to guarantee in the past that nuclear power stations would be built and heavily subsidised.

Peter Atherton: They were built by the state.

Stuart McMillan: I know that the evidence session is about renewables rather than nuclear—

The Convener: Yes, do not stray too far from the path.

Stuart McMillan: Okay, convener.

Looking at issues that the population raise about how they want their energy to be generated, do you agree that, if investment is to be made—it is currently being made and it will be made in the future—they would prefer energy to be made from cleaner and more sustainable resources, which do not leave a legacy that future generations have to try to deal with for many years afterwards?

The Convener: I am not sure that that is a fair question to ask an energy analyst. You are asking about public opinion.

Peter Atherton: You would have to ask the people. I am not aware of anybody yet standing for election on a renewables-versus-nuclear platform. If somebody does, I guess we will find out.

The point that we make in our report is very simple. At the moment, the investment community has confidence in the ROC scheme. We would expect it to have confidence in the electricity market reform, contracts for difference and feed-in tariffs, and it is willing to back assets—we have talked about the issues of the scale of the assets and things like that. For those assets to continue to be built in Scotland post the referendum, if there is a yes vote in the referendum, you would need to replace that confidence with confidence in something else—it is as simple as that. If you can and if the UK Government agrees to continue paying for renewables projects that are built in Scotland, that is fine—the problem is solved. At the moment, however, there is no legal pathway that I am aware of that says that the payments must continue post the referendum.

The Convener: Other members want to pursue the point. Do you have any further questions, Stuart?

Stuart McMillan: I have one other question, but it is on a totally different angle. It is not for Mr Atherton; it is for someone else.

The Convener: Mr Atherton, your paper has raised some legitimate interest among members, and other members want to ask you some questions.

Chic Brodie: You answered Mr McMillan's question about the referendum issue, but your report quite clearly said that an independent Scotland would create uncertainty that would threaten renewables investment. That is hardly a positive view in terms of your saying that you do not know what is going to happen thereafter. It has also been shot down by the investments in Scotland that have been made so far by large companies and by luminaries such as Peter Jones of *The Times*, who says:

"Simplistic assumptions devalue this Citigroup analysis of the future"—

a view with which I agree.

I want to ask Professor Arbon, because we are concentrating a lot on—

The Convener: Hold on a second. We must give Mr Atherton an opportunity to answer that specific point before we bring in other witnesses.

Chic Brodie: Okay. I ask Mr Atherton to expand on Peter Jones's comment:

"The key fact is that in the event that Scotland becomes independent, the Government of the rest of the UK will still have to meet its EU carbon emission reductions target"—

which is very important, as Ms McDade pointed out—

"and that looks to be impossible without electricity companies south of the Border buying green energy from Scotland."

How do you equate that with your statement that independence would create uncertainty?

Peter Atherton: I come back to the points that I made earlier. First, the idea that you can have a referendum on secession and not believe that it will create some uncertainty for investors in certain sectors such as utilities—which is a regulated energy sector—is preposterous.

Secondly, if you believe that the UK Government cannot meet its targets without importing renewable power from Scotland post-secession, that is absolutely fine. If that is so, the UK Government will be perfectly happy to sign a power purchase agreement for that power or, as we set out in our second report, say yes, yes, yes to the three questions that we set out. Ask them. That is what you need. You need somebody who has the money or the consumer base to say, "We will back these assets to the level of subsidy that we are currently backing them for the payback

period of the investment." It is simple stuff. If you believe that the UK Government will definitely do that, ask the question and get the commitment from the UK Government or from somewhere else. If you do not have that in 2013 and 2014, there will be great uncertainty and Mr Finch's project will not be financed. His board will not sign it off and the financial committee will not back it.

Chic Brodie: I understand that. I ask you to answer the question, if you do not mind. I have some knowledge of investment. Against that backdrop, why would large companies such as Gamesa, Doosan Babcock and Mitsubishi, knowing that there will be a referendum that will, in your words, cause uncertainty, invest £12.5 million, £40 million, £170 million and £100 million now?

Peter Atherton: I cannot speak for those companies. I do not cover them and I do not know about their investment decisions.

Chic Brodie: Perhaps your report would have been fairer if you had talked to those companies and asked them why they are investing.

Peter Atherton: Not at all. There are a couple of points to mention. First, most of the companies that you mention are plant and equipment manufacturers, so they will supply their equipment all over the UK and into Europe. They are therefore relying not on the subsidy but on someone eventually paying the subsidy to the person who builds the wind farm. They are equipment manufacturers so they will send their equipment all over Europe. They just need an attractive manufacturing base. That is point number 1.

Point number 2—

Chic Brodie: But they are not going to supply products unless they know that there is an end use for them, and that end use means that the conditions that you are asking to be in place will be in place.

Peter Atherton: Well, maybe they do assume that.

Chic Brodie: Otherwise they are going—

The Convener: Hold on, Mr Brodie. I do not want there to be a dialogue with one witness. This is not a court of law. We will allow Mr Atherton to answer the question.

Peter Atherton: I am sorry. I cannot speak for those companies, but it is not overly relevant to the point, which is that you will have to replicate somehow the degree of certainty that exists now.

Chic Brodie: Okay. We will agree to disagree.

The Convener: Other members want to come in on this point, but I seek clarification. If Scotland becomes independent, the UK-wide subsidy regime will disappear. England and the rest of the UK, or whatever it might be called, will then have to decide whether to meet its renewable energy targets by buying green energy from Scotland or elsewhere. How will the price of that energy be determined? Will it simply be determined on a market basis?

Peter Atherton: We simply do not know whether the UK renewables mechanism will disappear. Perhaps it will and perhaps Scotland will ask for the commitments that we set out in the second note that we submitted to the committee, and they will be fulfilled. However, there is clearly no legal, recognised pathway at the moment.

The feedback on our original note that I got from sources within the UK Government said that the Treasury, for example, would be concerned about making an open-ended commitment to a foreign country that it could continue to build whatever it wanted to build and it would be subsidised by the consumers in England and Wales. In exactly the same way, the UK does not provide Ireland or France or Holland with an open-ended commitment to buy whatever renewable power they produce.

Could England, Wales and Northern Ireland meet a proportional, slightly scaled-down renewables target from their indigenous resources without importing renewable power from Scotland? I would think so. The number of terawatt hours involved is not particularly huge. Would doing that be more expensive than importing power from Scotland? It might be.

Of course, the history of renewables in Europe is that countries have set up their own mechanisms because they recognise that renewable power is expensive and they want to offset that through the benefits of investment and jobs. That is why the UK does not import cheaper renewable power from other places. We will accept that offshore wind power costs £150 to £160 per megawatt hour, which is three times the market price of power, because we see that there are some benefits in spending that money at home. In the same way, renewable power coming out of Scotland might be somewhat cheaper than the alternative being produced in England, but the UK Government could decide that it would rather have the jobs and the investment and pay the extra for power. There is nothing in European Union law to stop countries doing that, although the European Commission is talking about putting some mechanisms in place post-2020 that will encourage or force, depending on which way you look at it, countries to buy from the cheapest source. If you can bring renewable power across your border more cheaply than making it yourself, the EU is talking about putting in mechanisms that

will make sure that that is what you do, but those mechanisms are not in place at the moment.

The Convener: Thank you. Rhoda Grant is next.

Rhoda Grant: I have two questions, convener. The first is a follow-up, and I would like to ask a question on a different matter later.

The Convener: Okay, we will also come back to you later, but I am quite keen to pursue the current point.

Rhoda Grant: Let us turn the argument on its head. If there were to be an independence referendum and Scotland voted to become independent, would the Government of Scotland have to take over the obligations to which the UK Government had signed up? Would it have to continue paying the subsidies that had been agreed for the term of the contract? I am not a constitutional lawyer, but one imagines that there would have to be negotiations about what belongs to whom and where liabilities for certain things lie.

11:30

The question then would be whether there is a big enough consumer base in Scotland to meet the commitments. It is clear that we have the resources, but if our resources became overdeveloped in relation to our proportion of the UK population, would that leave an independent Scotland almost in deficit, with a huge liability? Should we be very careful about allowing that investment, if we look at the question the other way round?

Peter Atherton: On the first point, it is a question of whether the existing assets will be grandfathered by the whole UK consumer base if Scotland secedes. We have not gone to a Queen's counsel and asked the question. I have spoken to a number of companies that have taken legal advice, and they believe that the assets will be grandfathered, although that is not 100 per cent clear. There is an argument that assets should be allocated on the basis of where they are located, and that the people in that part of the UK—if it breaks up—would pay for those assets. The legal advice that I understand the companies have been given thus far suggests that they have a very strong case to have existing assets grandfathered under the existing schemes or the subsidy levels of the existing schemes.

Rhoda Grant: So it would become England's, Wales's and Northern Ireland's wind, rather than Scotland's wind. That would be a strange situation, if it were to happen.

Peter Atherton: It is possible that, in any negotiations that would take place if Scotland chose to leave the UK, rights, assets, liabilities and debts would be allocated on a locational basis. However, we think not. We believe that there is a moral obligation on the UK Government to stand behind investments that were made because those assets are supported by 27 million UK consumers and 4.5 million businesses. We think that it would send a very dangerous signal to capital markets if the UK Government was not willing to grandfather existing assets. As I understand from the companies that have sought legal advice, the advice is not 100 per cent that that would definitely happen. You would need to ask the UK Government.

The Convener: Thank you. That was an interesting digression, but we are moving off the point somewhat, although Mr Atherton gave us a very interesting paper, so it is fair to allow members the opportunity to put some questions on it. However, I am keen to move back to the purpose of the inquiry. I do not know whether Mr Cunningham wants to say something specifically on investment.

David Cunningham: Peter Atherton has described the situation very accurately. The key thing is that we have a wholesale power price based on pay board pricing, and a ROC—a renewables obligation certificate—that is currently valued at around £45 per MWh. The likelihood is that if Scotland became independent and someone was going to construct a wind farm after the point of independence, they would sign—if both political sides were level-headed about it—a simple power purchase agreement that would allow an English distribution company to buy power from Scotland at the equivalent price. That would not be a ROC, but it would have the same value as a ROC plus the wholesale price. That, and a level-headed approach, would be what one would expect to happen, but that would be valid purely for onshore developments. Offshore, the risks and the pricing are completely different.

The Convener: That is very interesting, although it is a little bit outwith the scope of the report. I see that Helen McDade wants to come in, but I am keen to move on. We have been running on for about an hour and a half, and I do not want to digress too far from the subject. A number of other members want to come in, and I am conscious that Stuart McMillan still has points to raise.

Stuart McMillan: I have a question on community renewables that is probably more for Mr Wright, who made a few comments about the matter earlier. Are there other means of increasing the number of community renewables projects, and are there other issues facing small-scale and domestic renewables that the committee might consider or get information on for its inquiry?

Felix Wright: The sector that I work in is specifically community-scale, so I cannot comment that much on domestic stuff. Are you asking about the expansion of in-store capacity or the information that is available on the sector?

Stuart McMillan: Initially, we need information for the inquiry. However, you do not get information for the sake of it. What should we be looking at in order to help the debate?

Felix Wright: With regard to information, there is a pipeline of about 200MW of community renewable electricity-generating projects and we think that existing projects can play a role in providing a publicly accessible database on resource distribution across Scotland. We would be in favour of a remote-monitoring and retrofitting programme being included on whatever wind, hydro, biomass or other projects are already out there, in order to allow new community developers to find the best locations and save money, and to give the public a means of engaging with what has already been installed, and access to an independent source of data on renewables capacity in the community sector. We are working on that, but we need more resource to carry out more remote monitoring and retrofitting.

More broadly, the community sector is primarily looking for a stable support mechanism from the Scottish Government; indeed, depending on technology and the scale of developments, it might well need multiple mechanisms. Since April, the Government has been providing community and renewable energy scheme—or CARES—loans to cover at-risk costs during the risk-capital stage of developing renewable energy projects. The scheme is working quite well, but we would like confirmation of whether it will be continued and expanded. We think that it should be expanded if we are to reach the 500MW target.

However, that kind of loan scheme is not suitable for all scales of renewable energy development. With village hall or even farm-based projects, accessing a loan might mean that the project finance does not stack up and in certain circumstances a shared equity or grant scheme might be more appropriate. As a result, we would welcome the reintroduction of that option for some community-based projects.

Independent advice is crucial to community groups. At the moment it is delivered under the CARES contract, but it needs to be continued. The registered social landlord sector and housing associations are crying out to do more renewables work, but what they are doing is generally being done quite piecemeal and there is no confidence that all the technologies that they are installing work properly. That all goes back to my first point, which was that we need a sound evidence base and independent sources of advice on specific technical issues.

My last point about what the community sector needs goes back to general issues that have been raised about the need for a stable UK funding mechanism. Many of the programmes that we have worked on recently have been funded by the feed-in tariff, but things have come to a halt because of uncertainty about the feed-in tariff review. We do not know whether the referendum on Scottish independence will contribute to that, but I can certainly vouch for the fact that these issues are affecting projects in Scotland.

We need stability on these matters from the UK Government. Something that we have been pushing for—and something that the UK Government has raised and the Scottish Government has been engaged in—is the introduction of a community-based feed-in tariff specifically for community projects or for projects that deliver a high level of social benefit.

We think that it is a very good idea because one of the problems with the current feed-in tariff is that, although the money is being raised from the UK as a whole, it is going to specific developers who might be either UK or foreign-based, so the net benefit can flow to just a few individuals or out of the country. The advantage of a community FIT is that it would reground the cash flow. Money that was raised from Scotland would go back to Scottish communities, which would see the direct benefit. That approach would deal with some of the tensions between the inequality, or regressiveness in some ways, of a feed-in tariff that does not consider where the benefit from the investment goes. I could go on.

Stuart McMillan: That answer was helpful.

The Convener: A number of members want to speak. We will try to close the meeting at 12 noon, which gives us 20 minutes. I ask members to bear that in mind. I have on my list Mike MacKenzie, Chic Brodie—

Chic Brodie: Not me.

The Convener: Not Chic Brodie—that is helpful. I also have on my list Rhoda Grant and John Wilson.

Mike MacKenzie: Does anybody disagree that, however we meet our energy challenges and climate change challenges over the next decade and beyond, and whatever mix of generation technologies we use to do that, we will have to spend significant amounts of money? One way or another, that money will be provided by consumers, given that we are all energy consumers. There is no do-nothing or no-cost option. So far, the discussion has operated in a vacuum and has not considered the general

context. Does anybody disagree about the general context?

Helen McDade: Energy conservation costs about a third of the cost of any generation. It does not matter whether your favourite form of generation is wind, nuclear power or whatever. Generation is expensive. The position of the John Muir Trust and a lot of other people is that most public money should go to energy conservation. Scotland has a problem, because we have a division between the UK Government—which raises funds from UK consumers and hands them out primarily in ROCs to large developers, as has been said—and the Scottish Government, which is responsible for energy conservation and must come up with the money to help people to do that.

The committee could most valuably consider how the UK Government, the Scottish Government and other devolved Governments can negotiate how public money is spent. If such money was moving in to and out of the tax system, it would be better audited than it is. The Office of the Gas and Electricity Markets said in 2007 that the ROC system is a "very expensive way" to buy carbon emissions reductions. If it were to be asked now, it would say that its view has not changed.

We have not revisited the ROC system, which was introduced in order to bring new technologies from research and development to the commercial scale. Now, we are told that we can never envisage such technologies operating without such subsidy. That needs to be revisited. I do not disagree that public money is needed, but from the social justice and environmental justice points of view, consideration of how that is spent is urgently needed.

David Cunningham: I have direct exposure to energy efficiency companies. One great barrier to entry, in particular for the wider proliferation of energy efficiency technologies in buildings, has been inability to monetise them. Very few data exist to show how much energy is saved post-installation. There are other aspects, but Helen McDade is right to say that energy efficiency is a much lower-cost method of meeting carbon emissions reduction criteria than is building new energy facilities. However, monetising energy efficiency is an issue in the financial markets. Should a feed-in tariff for energy efficiency be created? That should be examined.

Professor Arbon: Those who have read the IMechE report will know that we had a major section on what we call the energy hierarchy, which we introduced five or six years ago. The first tier of that hierarchy is demand reduction and the second tier is energy efficiency.

I agree absolutely with Helen McDade. One big problem is that when Governments—not just the Scottish Government—look at the subject, they lump everything together under energy efficiency. Energy demand reduction and energy efficiency are very different things that require very different solutions. They are both extremely important, but we cannot just catch them all in one expression and hope to achieve anything. In my view—coming back to the original point about targets—we need very specific targets on both demand reduction and energy efficiency. Energy efficiency is both a demand-side and a supply-side issue.

11:45

Niall Stuart: I do not think that we should overlook the green deal that has just been announced by the Westminster Government, or the fact that the Scottish Government, over the period of the spending review, will spend more directly on energy conservation and energy efficiency than it will on directly supporting renewables or renewables infrastructure. The Scottish Government has a target of 12 per cent energy conservation between now and 2020. Even if we hit that target, it is still likely that we will need increased supplies of electricity for electrification of heating and transport in order to meet climate change targets. Energy conservation does not, therefore, necessarily mean lower demand for electricity and less need for renewable electricity.

I disagree strongly that the ROC has not promoted investment in new technologies. It is the ROC mechanism that has attracted companies such as EDPR to promote offshore wind here in Scotland, and which has created finance for companies such as EDF, Scottish Power, SSE and others to invest in the wave and tidal power industry, which has made huge strides over the past 12 months. There have been some less than favourable comments about overseas investors, but let us not overlook the fact that companies such as Iberdrola, EDPR and Repsol are investing hundreds of millions, even billions of pounds here in Scotland and already support hundreds, if not thousands, of jobs.

Mike MacKenzie: I am absolutely in favour of conservation of energy, but one thing that disappoints me is that, despite a pretty successful programme over the past 10 or 20 years of increasing insulation in houses and so on, considering the starting base that we came from, and despite climate change being in the public domain and everyone being concerned about it, we have not actually managed to reduce either household energy consumption or business energy consumption over the period. Year on year it continues to rise. I agree with you, but it strikes me that that is a considerable challenge.

On Helen McDade's point, we could finance development through consumers paying directly

on top of what they pay for their energy, but is it possible to take the taxation route? Politically, to increase taxation is extremely difficult. What concerns me is this question: albeit that there is a general feeling that we might wish for these things, how possible is it to achieve them?

The Convener: That is a very good rhetorical question, Mr MacKenzie. I will allow Mr Wright to make only a brief comment on it, because we need to move on.

Felix Wright: You ask why people implementing both demand reduction—using less—and efficiency measures has not happened more. There are two aspects to that. First, what makes people want to take those steps? That is an attitudinal question. There is then the question about how is it paid for: how do people afford it and how do they access the resources to do it? I talked earlier about having more projects in some sort of community or public-good ownership. That would be a form of engagement involving people in renewable energy projects, and it would provide an income stream to finance such capital-intensive measures. I can give examples of projects in the Western Isles, and on Gigha in my area of Argyll, that are using income from ROCs and feed-in tariff projects and ploughing it back into domestic insulation for people in their communities. That, to me, squares the circle.

Rhoda Grant: To carry on the point about community renewables and areas such as the Western Isles, in order to unleash the potential in the Western Isles—where a lot of the land is community owned, which lends itself to community schemes—the grid connection needs to be upgraded. It is my understanding that the cost of that will fall to the developer, which is different from what happens in the rest of Scotland. As it is not commercial companies investing on an urban scale—for want of a better expression—but community owners looking to develop projects in their communities that fit in with the local landscape, those communities have to fund the grid connection, which prices the whole project out of the market.

Felix Wright: My understanding is that community developers are treated no differently from commercial developers. The rules on the grid connection and upgrade costs, certainly for the distribution network, are the same. It is a widespread problem that developers have to front too much money to make the new connections. There is a disincentive to connect. We would like a greater proportion of the costs to be socialised among all consumers.

The Western Isles are not on my patch, so I cannot comment on specific projects. Niall Stuart will probably have the same overview of the position on grid connections.

Niall Stuart: There are two issues with the grid. The first is the up-front liabilities that developers have to take on board during development of a project. It is relatively easy for large developers to deal with those liabilities because of the strength of their balance sheets, but it is difficult for small community projects to take on such significant liabilities, which often run to hundreds of thousands or millions of pounds.

The second issue is the level of charges that projects will pay once they are up and running. That is a challenge in a lot of mainland Scotland, because the charges are higher than in other parts of the UK but, as I have already said, it is a particular challenge in the Western Isles, where projects that will be transmission connected have been quoted costs in the order of £90 per kilowatt as opposed to £10 per kilowatt in mainland Scotland. That is likely to be a big barrier to community projects in those areas in the future.

Felix Wright: The point is that the rules are the same but there is not a level playing field, because some organisations have big balance sheets and some do not. If they do not have them, they cannot absorb the costs.

I have a project on the Isle of Jura that is looking to collect 300kW—it is a relatively small wind turbine—and it is looking at grid connection costs of £1.5 million. That makes the project totally unviable. If the grid connection was upgraded, it would benefit everybody on the island, because more people could develop similar projects. As it is, the cost acts as a major barrier.

Helen McDade: I have a couple of points. The committee might want to look at community-scale schemes—it is important to refer to community-scale schemes rather than just community schemes, because the community can obviously benefit from a large scheme. There are different ways of working that are decentralised and do not necessarily need a grid connection. For instance, there are ways of using electricity to produce ammonia or hydrogen, and that could be used as energy for companies on an island. Scotland has perhaps been rather traditional in looking at the opportunities that exist.

We support community schemes that do not impinge on wild land directly. For example, we supported the North Harris Trust's applications for three turbines. However, I have to say that the issue is not simple, not just for the reasons that Felix Wright rightly highlighted but because the system is expensive and uncertain. Communities have a much harder time than large schemes in getting planning permission—which takes us back to the point about the differential approval rate—and the wind is not great. Even in really windy areas, it can be difficult to establish schemes, because of turbulence. The North Harris Trust has

not gone ahead with its scheme because of difficulties.

There are big difficulties for communities, and it would be nice if we could support them as much as we support big business. We should also look at decentralisation of the grid. The grid's costs are huge and, unless we think that we should subsidise everything that goes from the north to the south, there will be issues. There are real costs: UK consumers already pay for three quarters of the grid cost and it is not paid fully by the generators.

Chic Brodie: I had the good experience earlier this week of visiting the Energy Agency in Ayr. The demand side has to be focused on, and I agree with Ms McDade about decentralisation and that ownership needs to be pushed down to the community. That is something that we might want to discuss as a committee.

John Wilson: I am trying to think how to pose my next question. We are discussing the Government's renewables targets. Are the targets accepted by the energy companies? If so, why do we need so much subsidy in the shape of ROCs to allow them to be met? I am trying to take a wider perspective. We have Scottish Government targets and UK Government targets on renewables production, but we also have European targets. Why is there so much reliance by energy companies and developers on ROCs if they generally accept the targets?

Peter Atherton: Obviously, all the targets cascade from the EU-level targets. The Scottish target is a subset of the UK target. The Scottish Government has decided that it wants to do 30 per cent of the UK target, which is fine. Do the energy companies pan-Europe accept the overall EU targets? Yes. They accept them and they are keen to try to make some money out of them if they possibly can.

However, we should look at the committed investment programmes through to 2015 of the companies operating in the UK, which are pretty much set. The companies had discussions with their investors and looked at the bond markets and we pretty much know what everybody is going to spend between now and 2015. The run rate of investment is about a third of what is required to hit the 2020 target. Either the run rate will have to step up staggeringly post-2015 or the industry is planning to fail. My guess is that, as we speak, the industry is planning to fail.

The Convener: That is interesting. There are lots of hands up now.

Joe Philips: That argument ignores the other sources of capital that are coming through to make projects happen.

Peter Atherton: No. I have taken full account of all other outside investments as well. EMR is of course designed to widen the investment pool. It may or may not do that; there are some signs that it will have some success and some signs that it will perhaps not have as much success as is hoped. The legislation for EMR will not be introduced until next May and EMR will not be introduced until 2014. There is also the question whether the green investment bank will have a big impact. We are talking about a staggering increase in investment rates in the final five years to make up the shortfall from the period 2010 to 2015.

Niall Stuart's organisation came up with the figure of £750 million invested in the past 12 months. To hit the Scottish Government's targets, you need to invest at a rate of £7.5 billion a year, not £750 million a year, for the next eight years.

To answer Mr Wilson's question, the industry is working hard on a pan-European basis towards the target and is investing as much as it feels it can invest. However, the investment rate is well short of what is required and the UK in particular is running at a third of what is required to hit the target.

The Convener: I can see that a whole can of worms has been opened. I can also see that we are very close to our proposed finishing time, so comments should be brief.

Joe Philips: I just want to return briefly to Mr MacKenzie's point. Looking at the big picture, we know that we have to spend money, because business as usual is not really an option; we have to do something. Going forward, the committee should think about this as a balance of risk against cost. We could go for a gas-reliant scenario, which would be closest to business as usual. That might come in cheapest on paper, but it would be a huge gamble, because who knows what is going to happen to gas prices over the next 10 years?

There is not one silver bullet here. The Institution of Mechanical Engineers report discusses the hierarchy of options. You can do something on demand, you can look at energy efficiency and you can look at low-carbon sources and renewables. We do not need to do those things in sequence. We can look at all those things together and come up with a blended solution that meets Scottish Government policy objectives and provides a secure energy future for Scotland.

12:00

Colin Ormiston: I will answer the question about why we are here and looking at Scotland. The most important thing is the resource—that is why energy companies are here in the first place. I know that comments were made earlier about the

resource not being important, but it is important, whether it is the wind, wave, tidal or biomass resource. The resources are the main driver for our being here in the first place.

There also has to be a route to market. We are looking at engineering. We have to be able to deliver, so we must have the infrastructure, and there is good infrastructure here, although more investment is required. We understand that.

There must also be a smooth planning system that will allow the delivery of renewables. We have discussed throughout the meeting the impact of driving down costs. We all want to do that, but we cannot drive down costs unless we have a good pipeline of projects coming through. We want to attract investors, turbine manufacturers and all the things that develop the supply chain. As we have said before, there are jobs in that. Many things can come as benefits of investing in low carbon when we invest in it in all areas. What Scotland is doing is right and what is happening in the rest of Europe is right, but there are benefits to be gained as long as there is a lot of investment in the right areas with the right mechanisms to deliver.

John Wilson: I will move on, although I wanted to open that can of worms.

Do the witnesses think that we have the skills in Scotland to take the opportunities that exist with renewable technologies?

Professor Arbon: That is a crucial question, and we raised that issue in our report. As a learned society that is involved in training engineers, the Institution of Mechanical Engineers feels that we are way behind where we need to be on that target. For reference, it takes around 10 years from when a person leaves school to get a fully functioning chartered engineer. That does not mean that they are useless before then, but an experience factor is involved. We do not have 10 years. A declining number of people have gone into engineering-based courses over the past 30 years, pretty much year on year throughout the UK, but especially in Scotland. We consider that to be the biggest single barrier to achieving the targets.

The discussion has been very interesting, but I have missed the degree of urgency that we need. To express the challenge rather differently from how it is normally expressed, we have 108 months. That is an incredible challenge. I agree with Mr Atherton that the UK and Scotland are seriously behind on the run rate at the moment to achieve the targets that we need to achieve, and skills are at the core of that.

The Convener: I am conscious that we are over our time. Niall Stuart and Professor Mitchell can perhaps make brief comments, as another member wants to ask a question.

Niall Stuart: On the skills base, we already have in Scotland the headquarters of four major developers—SSE, Scottish Power, EDPR and Repsol—and a number of turbine manufacturers have committed to research and development or manufacturing assembly in Scotland. We already have significant activity on structures, we have our existing subsea sector, which is based in Aberdeen, and we have tremendous strength in financial services, which will be key to unlocking some of the investment challenges. Therefore, I do not doubt that we have the skills base here, but we need to grow it to a completely new scale. I am confident that we will do that, because schools, colleges and universities have identified renewable energy as a key growth area for employment over the next decade. When we speak to young people, school leavers and people at university, we find that the area excites them, and young people and people who are already in our workforce want to work in it.

Professor Mitchell: From the perspective of the universities and colleges, money is coming through from the Government to the Scottish Further and Higher Education Funding Council to get an alliance of further education colleges working on bringing forward the skills set. We are now articulating into the universities. Some students with a trade can get into university education and, through the energy technology partnership, we have money that is being used to train PhD students, working closely with industry. Therefore, we recognise the challenge. Ian Arbon is absolutely right. It is a time-critical exercise, but we are doing our best to try to achieve the aim.

Anne McTaggart (Glasgow) (Lab): My question, which was about skills and barriers, has just been asked, convener.

The Convener: That is the best news that I have had today. In that case, we will draw the session to a close. I thank all the witnesses for coming to the meeting. I appreciate that the session has been quite long and wide ranging, and it is fair to say that we have only skimmed the surface of a range of issues, but that was the intention today. This is not the inquiry; it has simply been a scoping exercise. The session has been very useful, as it will allow committee members to go away and reflect on the issues that we need to dig into in more detail as we get into the inquiry in the new year. I think that at least some of the witnesses will come back to the committee—if they are prepared to do that—for the formal inquiry, as we dig into the issues, so perhaps we will see some of you in the new year.

12:06

Meeting continued in private until 12:28.

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