OFFICIAL REPORT
AITHISG OIFIGEIL

Economy, Energy and Fair Work Committee

Tuesday 8 October 2019

Session 5

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ECONOMY, ENERGY AND FAIR WORK COMMITTEE

28th Meeting 2019, Session 5

CONVENER

*Gordon Lindhurst (Lothian) (Con)

DEPUTY CONVENER

*Willie Coffey (Kilmarnock and Irvine Valley) (SNP)

COMMITTEE MEMBERS

*Jackie Baillie (Dumbarton) (Lab)
*Colin Beattie (Midlothian North and Musselburgh) (SNP)
*Jamie Halcro Johnston (Highlands and Islands) (Con)
*Dean Lockhart (Mid Scotland and Fife) (Con)
Richard Lyle (Uddingston and Bellshill) (SNP)
*Gordon MacDonald (Edinburgh Pentlands) (SNP)
*Andy Wightman (Lothian) (Green)

*attended

THE FOLLOWING ALSO PARTICIPATED:

Professor Keith Bell (Committee on Climate Change)
Teresa Bray (Changeworks)
Anthony Kyriakides (Energy Saving Trust Scotland)
Elizabeth Leighton (Existing Homes Alliance Scotland)
Fabrice Leveque (Scottish Renewables)
John Mason (Glasgow Shettleston) (SNP) (Committee Substitute)
Euan McVicar (Office of Gas and Electricity Markets)
Professor Janette Webb (University of Edinburgh and Infrastructure Commission for Scotland)

LOCATION

The David Livingstone Room (CR6)

Scottish Parliament

Economy, Energy and Fair Work Committee

Tuesday 8 October 2019

[The Convener opened the meeting at 10:03]

Decision on Taking Business in Private

The Convener (Gordon Lindhurst): Good morning and welcome to the 28th meeting in 2019 of the Economy, Energy and Fair Work Committee. I ask everyone to turn electronic devices to silent mode. Apologies have been received from Richard Lyle. John Mason is here in his stead and I welcome him back to the committee.

Agenda item 1 is a decision by the committee on whether to take items 4 to 6 in private. Are we agreed to do that?

Members *indicated agreement.*

European Union (Withdrawal) Act 2018

Recognition of Professional Qualifications (Miscellaneous Provisions) (EU Exit) Regulations 2019

Recognition of Professional Qualifications (EFTA States) (Miscellaneous Amendments) (EU Exit) Regulations 2019

10:04

The Convener: Item 2 is consideration of two proposals by the Scottish Government to consent to the United Kingdom Government legislating using the powers under the European Union (Withdrawal) Act 2018 in relation to proposed UK statutory instruments. The first is the Recognition of Professional Qualifications (Miscellaneous Provisions) (EU Exit) Regulations 2019, which relate to the reciprocal framework of rules for the recognition of professional qualifications enabling European Economic Area and Swiss nationals to gain access to the regulated profession in which they are qualified in another EEA state or Switzerland.

The second is the Recognition of Professional Qualifications (EFTA States) (Miscellaneous Amendments) (EU Exit) Regulations 2019. The purpose of the instrument is to transpose the provisions of the EEA EFTA no deal citizens' rights agreement and Swiss citizens' rights agreement, to make minor changes to the Department for Business, Energy and Industrial Strategy and Department of Health and Social Care regulations and to address infractions identified in normal business by the European Commission.

Both regulations relate to regulations that were made on 19 February 2019, which amended existing legislation to ensure that a system of recognition of qualifications will continue to operate effectively if the UK leaves the European Union without a deal. Although the legislation is UK-wide, it applies to all regulated professions and intersects devolved matters relating to the regulation of teachers, lawyers, social workers, healthcare practitioners and others. The proposal will ensure that current recognition arrangements for those professions are maintained.

The notifications for the regulations suggest that they are all category A proposals; that is to say, they are technical with minimum policy choice or only one obvious policy solution. Is the committee content for those matters to be dealt with by statutory instruments laid at Westminster?

Members *indicated agreement.*

The Convener: As the committee is content, I will write to the cabinet secretary to notify him of the committee's decision.

Energy Statement

10:06

The Convener: Item 3 is a round-table evidence session on the energy statement. We have a number of guests with us, and I remind members to keep questions brief so that we hear as much from our guests as we can. If anyone wishes to come in, please raise your hand or we will see how the conversation flows. There is no need to press any buttons or operate the microphones, as they are dealt with by the sound desk.

I invite a brief introduction from witnesses and members, starting with Dean Lockhart on my left and working around the table. I ask our guests to give the name of the organisation that they represent and one or two short sentences on what that is about.

Dean Lockhart (Mid Scotland and Fife) (Con): I am a member of the Scottish Parliament for Mid Scotland and Fife.

Fabrice Leveque (Scottish Renewables): Good morning. I am senior policy manager at Scottish Renewables. We are the trade association for renewable energy in Scotland, representing about 250 companies across the electricity and heat sectors ranging from utilities and developers to small installers and manufacturers. Our main interest today is the policy environment that supports the businesses that are actively working with low-carbon energy.

Colin Beattie (Midlothian North and Musselburgh) (SNP): I am the MSP for Midlothian North and Musselburgh.

Teresa Bray (Changeworks): I am the chief executive of Changeworks. We are directly involved with the delivery of a range of programmes both in fuel poverty and for self-funded householders and small businesses on energy efficiency. We also work with local authorities and housing associations on systems delivery in areas such as district heating.

Jamie Halcro Johnston (Highlands and Islands) (Con): I am an MSP for the Highlands and Islands.

Anthony Kyriakides (Energy Saving Trust Scotland): I am the head of renewables at the Energy Saving Trust. EST is Scotland's and the UK's leading impartial organisation helping people to save energy and reduce carbon emissions. We do that by directly supporting consumers, helping them to take action by providing information and advice. We also help other bodies such as local authorities and community groups.

Andy Wightman (Lothian) (Green): I am an MSP for Lothian.

John Mason (Glasgow Shettleston) (SNP): I am the MSP for Glasgow Shettleston.

Professor Janette Webb (University of Edinburgh and Infrastructure Commission for Scotland): I lead a research group called Heat in the City. It is social research, not engineering or economic research, so we look particularly at the governance of innovation in relation to the future of heat systems in the context of climate emergency. I am also an infrastructure commissioner for Scotland with a particular remit for low-carbon infrastructure.

Jackie Baillie (Dumbarton) (Lab): I am the MSP for Dumbarton.

Euan McVicar (Office of Gas and Electricity Markets): I am general counsel at the Office of Gas and Electricity Markets. We are the Great Britain-wide gas and electricity markets regulator, and our primary purpose is to promote the interests of present and future energy consumers.

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

Professor Keith Bell (Committee on Climate Change): I am based at the University of Strathclyde, where I am an energy system researcher. I am here today representing the Committee on Climate Change, which I am sure members are very familiar with. We have a statutory duty to provide advice to the Government and the devolved Administrations, including the Scottish Parliament. "Net Zero: The UK's contribution to stopping global warming" was published in May, and I am very pleased to see that it is now setting a strong agenda on what we are trying to do policy-wise. We expect to publish a progress report for the Scottish Parliament next month.

Willie Coffey (Kilmarnock and Irvine Valley) (SNP): I am the MSP for Kilmarnock and Irvine Valley.

Elizabeth Leighton (Existing Homes Alliance Scotland): Hello. I am the director of the Existing Homes Alliance Scotland, which is a coalition of housing, environment, fuel poverty, consumer and energy advice provider organisations, all of which are working to argue for improvements in our existing housing stock to meet climate change and fuel poverty objectives.

The Convener: Thank you very much, everyone. I am an MSP for Lothian and the convener of the committee.

I will start with a question to Professor Bell and Professor Webb. Do we need a new target for non-electrical heat demand, or are the more recent climate change plan targets now sufficient? Perhaps Professor Bell is being offered up as the person to answer that question first.

Professor Bell: The CCC's view on the non-electrical heat demand target is that, although it is a potentially useful instrument, it seems in practice to have put a strong focus on the use of biomass and that is not necessarily the right approach in the longer term. There will be competition for the use of biomass, and there are potentially other, better ways of using it—for example, in the construction sector, in locking in carbon through the use of timber in the construction of buildings, and in its potential use as a fuel in the manufacture of hydrogen. That should be accompanied by carbon capture and storage. Its use at a smaller scale in buildings as a source of heat might not be the best approach in the longer term.

On the other hand, the commitments on building standards and towards low-carbon heating more generally without necessarily driving it down a biomass route are very useful. We see things in the energy efficient Scotland plan and things that are outlined in the programme for government as representing generally a good direction to take that does not drive down a particular solution that might not be the best one in the longer term.

Professor Webb: I would argue that the target is challenging as it is, because we do not have any clear-cut solutions for non-electrical heat demand and we know that the peak demand is very large compared with that for electricity use, for example. Exactly how we will solve that post methane gas through the gas grid is still somewhat unknown.

I would argue that it is more important to focus on amassing evidence in the next five years, developing larger-scale demonstrators than we have done historically for alternatives such as gas hybrid heat pumps on the gas grid, and working significantly on the development of district heating infrastructure, which we have debated in Scotland for a considerable period. We have not got very far forward with that, although the Committee on Climate Change as well as the Scottish Government recognise that as a no-regrets solution while the future of the gas grid is in debate.

The Convener: Do our other guests wish to comment on that particular aspect? Are our overall decarbonisation targets realisable, realistic and where they ought to be?

Fabrice Leveque: Given that the overall climate change targets have got tougher, our position is that we need to align the 2030 target for heat, as well as the other sectors, with the new targets. As Professor Webb said, the existing targets mean a

doubling of the current rate of energy efficiency and low-carbon heat deployment.

10:15

Even doubling would be difficult, but we have to first of all set a target that shows exactly what we need to do. Targets are useful in communicating to both industry and consumers what we have to do. As a priority, the upcoming climate change plan needs to clarify exactly what we are doing. I agree with Professor Bell, that we need a low-carbon heat target that does not differentiate between electricity and non-electrical heat. We need clarity, because the current target slightly confuses things around electrical heat and what is counted and what is not.

Anthony Kyriakides: To support the points that have been made, the target was set about 10 years ago, and obviously a lot has happened in the meantime. As Fabrice Leveque mentioned, what does that mean in practice? For our work with consumers, it would be of benefit if there were targets that are easier to spell out with numbers what they mean for people. In its report, the Committee on Climate Change stated that, cross-GB, there needs to be a million new heat pumps every year up until 2030. That is a number that people can start to get their heads around. In Scotland, it would maybe be around 100,000 heat pumps every year, which is about 2,000 a week. That is a number that it feels that you can do something with. It would be beneficial to be able to explain to the public what is happening and the scale of the challenge in such terms.

The Convener: Do you know how many heat pumps are being installed weekly in Scotland at the minute?

Anthony Kyriakides: From the renewable heat initiative, we know the number of domestic heat pumps that have been accredited under domestic RHI since 2014. I think that it is about 9,000 in Scotland. We are talking about a scale of change, or a magnitude of difference, of—

The Convener: It is about 9,000.

Anthony Kyriakides: About 9,000 heat pumps have been accredited under the domestic RHI. To go from that number, which was achieved over a period of five years, to what is needed represents a huge step change in the installation rate.

Elizabeth Leighton: It is no surprise that our organisation would emphasise the importance of energy efficiency in achieving a heat demand or renewable heat target. The more efficient we are—the more we reduce our heat demand—the less renewable heat we need. It may be useful to reference the target in a climate change plan, which presumably will need to be reviewed and refreshed in the light of the new climate change targets. The new targets include a figure for reducing heat demand from buildings as a separate target for domestic and non-domestic buildings. Equally as important as the generation of renewable heat is having an eye to looking at generation and supply side by side.

Professor Bell: As others have said, the targets are extremely important in setting a direction, providing visibility and helping the industry and supply chain, as well as home owners, to deliver some of the changes. They help building owners, including home owners, people who are renting, social home owners, and owners of non-domestic buildings.

Of course, implementation of the targets has to be backed up by action, which involves there being some prioritisation. As Anthony Kyriakides said, it is a big change and it is difficult for people to get their heads around it. It involves a very high capital cost, especially with regard to heat pumps. They are most effective if they are going into new buildings that are built to an appropriate—meaning a very high—standard of insulation. That is the opportunity to build up the supply chain and to start to build up confidence in how such things work.

The construction sector knows what it is doing when it is installing them. Again, they have to be installed right and they have to be known to be right. The obligation on new buildings to follow those standards starts to build that up. The retrofit is harder. You could argue that that is a bigger problem, because there are more buildings in that category. If that can be followed up with a sector that is already starting to get established, it might be more deliverable.

Jackie Baillie: I have a small follow-up question. The advice from the Committee on Climate Change was that, from 2025, no new gas boilers should be installed. That is around the corner. You have an idea of a route map; I wonder whether that exists. I wonder whether anyone has thought through the consequences for jobs, because a huge number of people are employed in the gas sector. I wonder about the interaction with fuel poverty. It is easy to say, but how easy is it to deliver against what Professor Webb said, which is that we need five years of research? The two do not fit together. As a policy maker, I am slightly confused.

Professor Bell: It is a very fair question. The recommendation that there should be no new gas boilers was specifically to do with new homes. A lot of the scenarios for the deployment of heat networks are outwith that sector. The evidence that the CCC considered seemed strong. We are talking about a combination of measures that

includes new homes being built to that high standard.

You are right that somebody will have to bear the higher up-front cost. The issue is how that gets passed through in the cost of the building. There is a big variation in the cost of new homes, which is to do with the value of the land and the way that the market goes. I am not clear how that will develop, but there will be an extra cost. However, standards might come in further down the road that would oblige people to rip out gas boilers and replace them before the end of their lives. Relative to that, the cost of what is proposed is not that high. All of this has to be seen in the context of the general transition towards increasingly lower carbon emissions.

New jobs will be created as a result of the skills and expertise that are required to install the heat pumps correctly. Setting them up in the right way is not a trivial task. The opportunity for reskilling must be taken seriously, and that might need investment. It is important that the industry takes on a large part of that cost. The question of how to oblige the industry to do that is one that I would put back to you, as policy makers. There might well also be a role for Government, in relation to further education colleges and so on.

The commitment of individuals will be needed, too. A lot of home builders take on contractors on a short-term basis. Do they have the right skills? They will be certified in the right way, but the responsibility is placed back on individual workers. When they bid for work, are they able to get those contracts? If they are to commit their time on evenings or weekends to do a course to improve their skills, they must have confidence that there is a market. The market, the provision of the training and the certification process have to come together. We must have confidence that the workers know what they are doing. Because of the cost that goes with it, that might need Government intervention. We must ensure that the skills are at the right level, that the builders deploy them in the right way and that buildings are finished to the right standard. It is not good enough just to look at the demonstration house on a new estate. In order to give confidence that everything is done correctly, the whole housing stock must be sampled.

Professor Webb: I should say that I meant evidence, not research. Do not worry—I am not asking for research funding.

I am more concerned about the fact that, as Keith Bell's responses indicate, we are not yet clear about how to decarbonise heat in our entire building stock. We need to be clear about that very quickly. In the next five years, we need to make those key decisions.

I am aware that the powers that we have in Scotland are perhaps not adequate to the purpose of the full decarbonisation of heat. The major powers over energy are reserved to the Westminster Parliament. There is an argument for greater devolution of powers, for instance in relation to regulation, taxation and licensing. Nevertheless, in the interim, we can develop the larger-scale demonstrators that I suggested that we need, so that we can examine what works effectively in what areas, including low-income areas, where, I would argue, we should fully socialise the costs of those upgrades, because there is a societal benefit in terms of jobs and welfare, as well as local economic regeneration.

We are evaluating the energy efficient Scotland pilots—we are doing the social evaluation and the Energy Saving Trust is doing the technical evaluation—and we have seen that although people are initially somewhat reluctant because they anticipate disruption from changes to their buildings and homes, such as changes in insulation and the heating systems that they are using, momentum can be gained locally through area-based schemes. People in the community can be supported and encouraged to work together to move through the process, and people are pleased with the results. Something that we had not anticipated is the effect of the aesthetics afterwards, which people have been very positive about. They have said, "The area looks great now—it looks like somewhere you would want to be."

I suppose that that relates to my plea for evidence. We need to ensure that we gather evidence and showcase such examples to show that the approach works and that it is a way to greater prosperity and skills. I agree with Keith Bell that there are significant work opportunities here if we manage the process well.

Fabrice Leveque: I agree with what has been said in response to the question. The heat industry is a large and varied one with different sectors. I will quickly go through the broad strategy that both the UK and Scottish Governments are following, because I think that discussions of this nature benefit from people understanding the different sectors that we are talking about. The electricity sector is a fairly homogenous one, but the heat sector comprises different elements with different supply chains. By going through that, we can see where the opportunities and challenges are for the existing workforce and the future workforce.

Most buildings—about 80 per cent of them—are connected to the gas network. That is the core of the problem. The strategy is to roll out energy efficiency, which has a different supply chain. Scotland's supply chain is a small one, but it is arguably the best one in the UK, because we have

held on to our fuel poverty alleviation schemes. Changeworks, which Teresa Bray represents, does a lot of really good work in that space. However, that supply chain needs to be built.

For buildings that are on the gas network, the key priority in the near term is the rolling out of heat networks. They would be in inner-city areas and they would primarily serve large commercial buildings. The majority of the workforce in the gas industry service individual households with gas boilers. If we roll out heat networks in city centres, we will take some work away from the guys who install large commercial gas boilers, but many of those firms also do low-carbon heat, so there is quite a strong transition story on the existing industry moving into doing heat networks.

For everywhere else that currently uses gas, where we cannot do heat networks, we are probably looking at either electric heat pumps or perhaps hydrogen in the existing gas network. That is where Professor Webb's point about demonstrators and more evidence is key, because that is a large proportion of buildings. At this stage, we do not have an industry that is doing those technologies. We need to invest in showing how the solutions can be done and how we can get the current workforce into those jobs.

The 20 per cent of buildings that are not on the gas grid are primarily in rural Scotland, and the story there is really about installing heat pumps or biomass. The existing supply chain is primarily for oil heating, with people delivering oil to those communities, although there is a small amount of liquefied petroleum gas as well. The UK Government is already working on an engagement plan to advertise to that industry that off-gas-grid households, because their heat costs are higher and the CO_2 emissions are higher, will be the first to transition away. Again, there is a defined industry there, and we can see it transitioning into doing things such as heat pumps and biomass. That is already being thought about, although I would argue that the Scottish Government is lagging a bit behind the UK Government in its thinking there.

10:30

The last piece of the puzzle is new buildings. They are a small part of the overall picture, because we build only around 15,000 new homes a year in Scotland. That involves the construction sector, which, because of the UK and Scottish Government announcements, is gearing up to switch from installing fossil-fuel heating to installing low-carbon alternatives. The challenge is less great there, because it has been well advertised for at least a decade; frankly, we should have stopped putting fossil-fuel heating into new buildings, and used low-carbon solutions, sooner.

That was a tour of the different sectors and the job impacts.

Teresa Bray: It is important that we bring the discussion back to the context that we are living in a climate emergency. The Committee on Climate Change came out and said that it is technically feasible for Scotland to be net zero by 2045, which has been agreed with support from all political parties. However, it will be challenging to do that, and it will require a change in the mindset and increased urgency. The culture that we have makes achieving that target much more challenging; often, it takes lots of consultations and a very long time to develop policies, we have a very risk-averse approach and there is a lack of support to make things happen.

Nonetheless, Scotland can do it. We have put in place so many things that, if we fully commit, we can follow through. Fabrice Leveque mentioned that, although we have a lot of fuel poverty programmes—such as the warmer homes Scotland scheme and the area-based schemes—they are not operating as effectively as possible, and that is not due to a lack of supply chain, which is there. For example, we have not been able to promote the warmer homes Scotland scheme nearly as widely as we would want to. If they knew about it, a lot of committee members' constituents would be eligible for it; often, people have to have low energy efficiency and be on suitable benefits. There is a need for further promotion.

We have area-based schemes that work in fuel-poor areas and do projects such as external wall insulation. However, a lot of the local authorities struggle to deliver, and we must think about what extra support they need. A poor procurement officer who is not familiar with what is available will work on their own stock, but they might not be willing to work in the private sector or to sign off on something. In one of the local authorities that we work with, there are decision trees whereby it take five months from recommending a contractor who has gone through procurement to actually awarding a contract, and they end up handing back money, because they do not get through. Cultural change is required. Although leadership is being shown in Parliament and in local authorities, it is not filtering through.

Similarly, on the heat side of things, there are opportunities. The main manufacturer of heat pumps is in Livingston. We could be building heat pumps in Livingston rather than getting boilers from down south, which would be a big advantage. A lot of the skills are very similar to the skills that gas boiler fitters need; a few technical changes are required, but they have the basic skill set.

There is a need for consistency, whether in making sure that building standards change urgently or in programmes such as the energy efficient Scotland transition programmes, which, as Jan Webb mentioned, are working with the self-funded markets in some areas. We have been notified that we must review those programmes—we must wait and fully evaluate or stop them, even though support is being built up, and maybe start them again in a year or two. However, we just do not have time to do that.

Although some mistakes will be made, we will have to become slightly less risk averse if we are going to hit those targets, and it is vital that we hit them. If we do not achieve them, what will we say to our children? There will be an opportunity to do that.

Colin Beattie: I think that it was Professor Bell who clarified that the policy of no new gas boilers from 2025 will be for new builds only, which is fine. However, as Fabrice Leveque said, they represent only a certain number of houses every year. The big challenge is to retrofit the existing housing stock. We have talked a lot about heat pumps, which, in my opinion—I hope that someone will correct me—are unlikely to be the answer when it comes to replacing existing heating systems on an industrial scale across the country. Most likely, as in European countries, they will be more useful in rural and semi-rural areas. However, we have to replace gas. What are we going to do to replace, on an industrial scale, the provision of gas to the vast bulk of our houses? I know that things such as the use of hydrogen are being considered, but I am unclear how far down the line we are with that.

We can talk about ground-source and air-source heat pumps, and biomass—we import the pellets from Scandinavia, which does not seem to be a brilliant idea—but where are we on tackling the big question of how we replace the gas supply? Is it feasible to switch across to hydrogen? How much would that cost, and what would the impact on householders be? Can people use hydrogen for cooking, or is hydrogen good only for heating? Is it in fact good for heating? I know that there are certain issues, such as safety concerns, around hydrogen. Where are we on that?

Professor Bell: I see that Colin Beattie is looking at me, so I should respond.

You are absolutely right. The big challenge is in the existing building stock—not just homes, but the whole stock. As Fabrice Leveque said, much of that is about the gas grid. We have to stop the unabated burning of methane; you hit the nail on the head there.

Where are we? There are still some big uncertainties. However, the net zero targets of 2045 for Scotland and 2050 for the UK are looking increasingly credible and achievable, and not just in the particular scenario that the CCC has used. There are various detailed ways in which those targets could be achieved, but it seems that there is at least a pathway.

Many of those scenarios include hydrogen. It seems increasingly unlikely that we can meet the targets without hydrogen—perhaps we should put it that way round. The question then becomes how much we use and how quickly we get the systems in place. There is a lot of discussion—to go back to what Jan Webb said about the need for evidence—about the safety issues around hydrogen, and its usability and how people interact with it. Will it actually be useful for cooking? Would people know when the gas was lit, and would they realise when it was too hot? All those issues have to be addressed, and there are projects going on to address them.

We need to establish a market to get the hydrogen in the first place. We manufacture hydrogen at present, although not in a low-carbon way. There is a lot of talk about building up industrial clusters in centres where there is already a market for hydrogen for other purposes. The trick is to see how we can transition over time to manufacturing low-carbon hydrogen. It will be very difficult to get to zero carbon; steam methane reforming still produces some emissions. The system is building up in pieces, if you like—that seems to be how it goes.

I understand that we could have a blend of hydrogen—of up to about 20 per cent—in the existing gas networks. We can envisage getting a market going there. In order to do that, the critical path in the short term seems to concern the statutory rules around safety and billing, as was touched on earlier. Hydrogen does not have the same calorific value as methane, so how do we measure it and bill people in the right way? I do not know how long it will take to get the standards updated and written down—we would need to talk to someone from the Health and Safety Executive about that.

On the question about the gas grid, that is a big issue. I was in a meeting yesterday with the UK Energy Research Centre, and that question came up. As the CCC says, a decision needs to be made around the mid-2020s on what is happening in that regard.

This is just my own thinking on the matter—it is not necessarily a CCC line. Perhaps it is not enough to talk about the gas grid—we might need to look in more detail at the components of the gas grid. There are differences in terms of how we might transition the transmission network from the distribution network. Much of the gas distribution network is already being replaced and I understand that most of the new stuff is hydrogen

ready, or so other people tell me. That might not be true; it will depend on how it is done. We have to look precisely at what has already been done in that regard, where the network is now and where it sits relative to the potential supplies of hydrogen. There might be different strategies in different areas with regard to what we do with the gas grid. We have to think about the gas grids in different areas.

I do not have any answers, but we might be able to break down the question into other questions that are easier to answer in the shorter term.

The Convener: I will take a brief follow-up question from Jackie Baillie before seeing whether Elizabeth Leighton, Euan McVicar or Professor Webb have any answers.

Jackie Baillie: My point is a follow-up to what Teresa Bray said. The thing that the committee struggles with is that it is very easy to declare a climate emergency, but much harder to drive implementation, so forgive us if we question you closely in order to find the best way forward. It is not clear to me that somebody is co-ordinating all the different strands and has a clear idea of what we need to do.

Teresa Bray mentioned fuel poverty. It strikes me that low-carbon heating systems are very expensive at the moment, but I hope that the price will reduce. We are dealing with two sectors: the rented sector, whether that is social or private sector renting, and homeowners. What incentives do we need that will, first, not exacerbate fuel poverty and, secondly, increase the uptake among private sector landlords and homeowners? Do we need a replacement for the renewable heat incentive or the low-carbon infrastructure transition programme?

The Convener: Perhaps Teresa Bray can have a think about that, because it is on a slightly different subject. Gordon MacDonald had a follow-up for Professor Bell and then we will hear from the three guests whom I mentioned: Elizabeth Leighton, Euan McVicar and Professor Webb.

Gordon MacDonald: How viable is electric heating in terms of replacing gas central heating, given that Scotland regularly exports more than 25 per cent of the electricity that it generates to the rest of the UK? Is that not something that is renewable? How efficient is electric storage heating these days, for instance, and are there incentives in place to encourage homeowners to install some form of electric heating?

The Convener: I invite Elizabeth Leighton to come back on all those points.

Elizabeth Leighton: I will try to do that briefly. First, on gas and decarbonisation of the gas grid, I will quote something from a CCC presentation that amplifies what Keith Bell was saying. The slide is called “Hydrogen myth busting”. We would all desperately like to know that hydrogen can seamlessly replace gas in the gas network without having to change very much, so that we will hardly even notice. However, I do not think that that will be the case. The presentation says:

> “The sunk costs of the gas grid do not mean that economically it is a no-brainer to switch it over to hydrogen and use it to serve boilers as we do at the moment ... There is not enough ‘surplus’ low-carbon electricity to meaningfully contribute to hydrogen supply at scale”.

I think that that is what Keith Bell was getting at regarding the components of the gas grid. There are components for which it will be appropriate to use hydrogen, particularly with regard to industrial process heat, but hydrogen is best used selectively alongside mass electrification; it is not a silver bullet. We have to accept that fact, start from that point and, given that that is the case, ask what we now know that we need to do. As I have said before, a fabric-first approach to energy efficiency is going to apply in any case, and there are some figures in a report commissioned by the CCC that show that the UK could avoid some £6.2 billion annual costs, which is the amount more that it will cost if we do not go down an energy efficient route. We would also avoid electricity network investment costs for the UK of £4.3 billion. Those are massive sums and they will translate to costs to Scotland as well.

For on-gas energy efficiency, we have already mentioned the hybrid heat pump demonstrator projects that are being rolled out. Those should be initiated as soon as possible. As far as I know, there is only one in the UK so far, in Wales. There is no reason why that should not be replicated and built upon for Scotland, because we know that we need to do that, as well as installing heat networks and heat pumps where appropriate.

For off gas, I want to turn to what are referred to as low regrets options. We know that we have to switch away from high-carbon fossil fuel heating systems—oil, coal and LPG—and we should be doing that now. We should be signalling now that we need to phase those out. We recommend that that should happen from 2025, but with adequate support so that the vulnerable are not disadvantaged, and with a replacement for the renewable heat initiative so that the self-funded market is incentivised to take it up. That should go alongside energy efficiency improvements, of course, because a heat pump will only work effectively if a home’s fabric makes it highly insulated.

There are things that we can do now, because, as Teresa Bray said, we could build on existing low regrets programmes in off-gas areas with appropriate support. Let us not leave behind the

fuel poor or rural areas in the low-carbon transition; let us make sure that everybody benefits.

10:45

Euan McVicar: I echo a number of those points. It is clear that a number of things can be quickly and easily done now, and they ought to be done. However, it is clear from our discussion that a number of quite big choices still need to be made about the most effective and efficient ways to deliver the decarbonisation of heat. Going back to Professor Webb's earlier point, we are supportive of taking action now to gather knowledge that shows which is the most effective way to deliver decarbonisation at the lowest cost, so that we can protect consumers, particularly vulnerable ones, who often are those who are most badly affected by the cost of heat. It will be hugely helpful and powerful to gather strong evidence and knowledge on that now to inform the big decisions that need to be taken.

I want to say a couple of things about hydrogen. It is right that hydrogen has a lot of potential for decarbonisation, but a lot of further work needs to be done. In particular, a legislative and regulatory framework is needed to support a greater roll-out of hydrogen across the gas network.

With our price controls on the gas network, we are encouraging network companies to build in needs-based investment cases for low regrets investment in getting the gas network ready for the roll-out of hydrogen. There are a lot of relatively low-cost, low regrets actions that could be taken by network companies to do that, so we encourage them to do so. In the meantime, we can build up an evidence base that helps us work out which is the right big-picture path to take.

Professor Webb: I want to introduce the P word into the discussion: plans. The area is crying out for co-ordinated, systematic planning and development. The evidence coheres around the argument that the solutions for low-carbon heat, including hydrogen, will probably differ in different areas. We use a lot of heating for buildings and to get hot water—we should not forget that in Scotland—so we need to plan systematically to keep the costs down, apart from anything else, and to move on with the necessary work to get this decided.

Our clear, no regrets move is to encourage the reduction of the carbon content of gas in the gas grid by whatever measures are available. I know that the current round of business planning for the next gas price control review encourages such moves, which is a valuable and important starting point.

On what will work with regard to hydrogen for heat, I am not an engineer, so I cannot speak from a technical perspective. However, I know from the policy analyses and modelling that have been done so far that that could be an expensive route to go down. It depends, because, as Keith Bell mentioned, the calorific content of hydrogen is lower than that of methane gas, which could result in some difficult questions about tariffs and billing, particularly in relation to the socially equitable distribution of costs.

There are some thorny questions for policy makers and politicians. For example, if we had a focused hydrogen demonstrator in a particular area—around an industrial cluster, say—and explored its use for heating all the nearby buildings, should those costs be spread across the whole population of heat users or should they be concentrated in one area? There are some politically challenging questions about who pays for what that we do not yet have clear answers for, hence my request for planning.

The other area, which we tend to forget because we have not got very many of them, is district heating networks. We waste an awful lot of heat from industrial processes and we emit heat into the air and into water, including rivers. We could recover that heat by using large-scale heat pumps and building heat network infrastructure to pump the hot water round the system. However, as Fabrice Leveque and others have alluded to, that only makes sense in areas in which there is high heat demand and diversity of demand, otherwise you cannot justify the capital infrastructure of that new network.

On the other hand, as I understand it, converting our existing gas grid to be fit for hydrogen—certainly if we are using steam methane reforming—is also a very high capital infrastructure proposal. It is probably higher than developing heat networks in areas in which they make economic sense.

The Convener: We will go back to Teresa Bray before we go much further, then Willie Coffey wants to come in. Teresa Bray, I hope that you can recall the question.

Teresa Bray: I apologise if I appear to have been critical. In Scotland, the average energy efficiency of our homes is higher than in the rest of the UK, partly because traditionally we built a lot of flats—we have high-density housing—but also because of Government programmes that we have continued with. Those programmes have been good for improving energy efficiency and for jobs, because we have been able to provide continuity of employment. What we do not want to do is chop and change all the time, because then there is no continuity.

Particularly in social housing, we have also been supported by very clear targets. A similar thing has to happen in the private rented sector, because, unfortunately, some of the poorest people live in very poor-quality housing, and that is just not fair. We need to have regulation and an expectation of what has to happen, and that has already been signalled. The majority of properties that have to be improved can actually be improved relatively easily, particularly among the tenemental stock. Tenement properties are good for energy efficiency compared with an awful lot of other housing because they share so many walls.

We have a greater proportion of housing that is off gas, so we need to look at how we use the renewable heat incentive to support the transition to low-carbon heat. In Orkney, there is huge spare capacity with regard to generation, so we should be looking at how we can address that. One of the difficulties is that electricity pricing is not done in a way that supports electric heating. The excess capacity would allow variability, such as using air-source heat pumps or high-heat-retention storage heaters. They do not need to be on for every peak, such as when everybody goes to make a cup of tea after a particular television programme—people do not have to have their heating on at those times. If people start to use smarter heating systems, that needs to be reflected in the price that is charged to householders. If householders are managing their own demand, they need to be rewarded. You should not just be rewarding them for battery storage in terms of aggregation. It can be one of the main factors, but the pricing mechanism does not reflect everything that the householders are doing.

We are doing pilots in Scotland to see what we can do, which is challenging, but we have got to push—perhaps through the Office of Gas and Electricity Markets at a UK level—and ask how we address the spare capacity. We will be looking at having local energy systems, particularly in remoter areas, because transmission and distribution costs can be avoided by doing so.

There is an opportunity with local energy systems and there is a need for regulation. It comes back to the fact that the best thing to with heat is not to reuse it. Energy efficiency has got to be the prime area of activity. We are working on that and we will continue to look at how we further develop the programmes.

We are working through a range of things, although they may not have been brought together into a very clear plan. With agile development, you try things out and you develop what is successful and quickly ramp it up. We cannot wait too long to have a plan. The gas network is a real challenge, but we could start to address housing that is off gas immediately. It will need capital investment, but we need to make that investment for the fuel poor. We need to look at how we assist owner-occupiers to use economies of scale. That is starting to happen with some of the energy efficiency transition programmes. We have seen with the use of photovoltaics that prices just fall, and there are likely to be similar developments with heat pumps.

We have to start building. If we wait too long for a whole plan, in particular for the gas network, we will not get there. We can take on the work where we have the opportunity and the control to do so in Scotland.

The Convener: Fabrice Leveque wants to come in briefly on that point, as does Andy Wightman. We will then come to Willie Coffey's question.

Fabrice Leveque: Jackie Baillie mentioned policy, which I am keen to touch on, because that is the most crucial area for Scottish Renewables. We represent companies that are trying to compete against fossil fuels, and we need policies to level the playing field if we are to have a market.

One of the most important pieces of potential Scottish Government policy is the proposed heat networks bill that has been announced for introduction in the current parliamentary session. As we have discussed, heat networks have a clear role to play; there is broad agreement that they are a low-regrets solution. We should be building them now, and we have a supply chain that would enable us to do that.

The heat networks bill will be a good litmus test of whether the Scottish Government is serious about addressing the climate emergency. The bill has been at least six years in development, and it is an opportunity not only to regulate the sector—we know that the bill will include measures to license operators in order to enhance standards—but to introduce legislation that will help to grow the market and help people to deliver heat networks.

As an industry, we still do not know whether the measures that we have asked for will be in the bill. If they are not, it will be a huge missed opportunity. If we are not able to pull together a set of policies for a technology that we already use and for which there is a clear case, I cannot—to be frank—see all the other things that we have discussed happening any time soon. The heat networks bill needs to include measures to address demand risk. For example, it should include exclusive zones to ensure that heat networks happen in the right place. We also need measures to compel buildings, if they are the right kind of building in the right place, to connect to the heat network. Only the inclusion of such measures will address the risks that currently prevent those markets from developing.

That is in addition to whatever replaces the RHI and the LCITP, which were mentioned earlier. Those policies are needed alongside the heat networks bill, because they subsidise the low-carbon inputs to help them to compete against the very low cost of gas, and they also help with the capital costs. Heat networks allow us to tap into heat in sewers and in rivers, but to get to that heat we need to build the infrastructure to extract it, abstract water and so on.

That is a bit of a plea for the policies that we need on the technologies that we know that we have to deliver.

Andy Wightman: I want to pick up on Elizabeth Leighton's point about getting demand down at the same time as decarbonising heat, and challenge Teresa Bray's optimism. The European Union directive on the energy performance of buildings set a net zero target for the energy performance of all public buildings by the end of 2018, and of all new buildings by the end of 2020. Neither of those targets has been achieved.

The Sullivan review, which was commissioned by the then Scottish Building Standards Agency in 2007, recommended a target of net zero carbon buildings by 2016-17. That date has passed, and we have not achieved the target. The new building regulations that came out this year make no changes at all to CO_2 reduction targets from the 2017 regulations.

The powers to enforce higher standards in new buildings are not being delivered. Why is that? Why, for example, are there no improvements on the regulations from 2017?

Elizabeth Leighton: I share your frustration. We have said that there is no reason for us to go at the same pace as the UK on new-build standards, as we can move faster. We can build net zero homes today—there is no reason why we should be building homes that are reliant on the gas grid. I would urge the building standards review on the standards that will come into play in 2021 to be more ambitious.

With regard to regulations for existing stock, there was a missed opportunity—at least, I have not seen it taken up—to bring in a trigger for regulation at the point of major refurbishment. When refurbishment is under way, people are already experiencing disruption and thinking about how they can improve their home, so it is a good opportunity, as well as being economical, to encourage and incentivise people. Ultimately, minimum standards could be set for home improvements.

There are lots of levers that could be deployed in the building sector that are not being deployed. Our recently published report "Pathway to zero carbon homes by 2045: warm, climate friendly and affordable to heat" builds on the CCC net zero report, puts it into the Scottish context and asks what the policy levers are that could deliver the change. It will be a combination of regulation, incentives, grants for the vulnerable and so on. They will all have to come together.

As Jan Webb said, we need better co-ordination. We need an independent oversight body that can get on with delivery. We simply need more horsepower, if you will, and capacity to drive forward the energy efficient Scotland programme.

11:00

The Convener: We will go to Professor Webb and then Willie Coffey, who has been waiting patiently to ask a question.

Professor Webb: I endorse what Elizabeth Leighton said. I do not understand why we do not have higher building regulations in Scotland, and why we do not already have a zero-carbon standard for new builds when we clearly have the materials. We might not have the skills, but surely skills development is an economic opportunity.

As far as I am aware, the concern seems to be that setting higher standards chases developers away to where they can build cheaper or get better financial returns for the same outlay. That contradicts the commitment to net zero emissions and the statement signing up to recognising the climate emergency. I want to see policy put in place to make sure that we get there last year, ideally, or certainly as fast as we possibly can.

More important, arguably, is the retrofit of our existing building stock. We have the makings of a powerful policy framework in the energy efficient Scotland programme. However, in evaluating the pilots, we have seen how slow those developments are, and how challenging it is in the current resourcing and management model, and co-ordination model, to move ahead faster and more coherently on an area basis. The area basis is important to reducing the need for space heating in all our building stock, including our public estate, which can lead by example and show the kinds of standards that can be met.

Again, we tend to stumble over how it is all going to be made affordable. If we cannot make it affordable, we are not going to respond to the climate emergency that we have declared. We all know that, and it is not at all contentious, but we still do not seem to have the commitment to resourcing it properly, or the timetable behind it. That includes local authorities that are not necessarily able to do it. Teresa Bray gave the example of just how long the procurement process takes. In the pilots for energy efficient Scotland, we have seen single buildings take an awful long

time to get upgraded because they are multi-occupancy, multi-ownership and often multi-use buildings. We need to regulate to get over the difficulties of collaboration and co-ordination in multi-occupancy buildings and across our building stock.

Willie Coffey: I invite the panel to give us a glimpse of what is happening in Europe. We have information that suggests that the percentage share of energy consumption attributable to renewable heat is much higher across the European Union than it is in the United Kingdom and, indeed, in Scotland. In fact, it is about 19 per cent in the EU compared to about 7 per cent in the UK and 6 per cent in Scotland. Can any of the witnesses give us an idea of why that is the case? What lessons might we learn to bridge that gap?

The Convener: Why are European countries perhaps better at delivering some of those things than we are? Is it down to planning? What about executing the plans and delivering what we plan?

Anthony Kyriakides: I will add to the previous conversations. There has been a lot of discussion about what Government can do and what the industry can do. We require an empowerment of the population, as we see with the climate strikes. Most people will not know what renewable heating system options are available for their homes. The Scottish Government has services through the home energy Scotland scheme to raise awareness. However, the scale needs to change drastically. People need to demand that they live in a home that is low carbon and more energy efficient. That is not on people's radar.

We support anything that would raise awareness on a national scale, to make people aware of the fact that change is happening and is coming, and to empower them with the information that they need to make those decisions, whether that is now or in five years' time, when they need to change their system. That will give signals to industry that there is a demand for it to move into those areas and to develop the supply chain accordingly. The industry will respond to that, as well as to policy drivers.

Professor Bell: A bunch of things have come up that we ought to tie together.

Gordon MacDonald raised a question about electric heat, which is related to the question that Willie Coffey has just asked. In many places in Europe, such as France or Scandinavia, there is already a lot of electric heat. In Denmark, there is a lot of district heating but there is a lot of renewable electricity generation, such as wind. In Norway, there is a lot of hydro power, which is really low carbon. In France, there is a lot of nuclear power, so there is a lot of electric heat there. The French have a big question about what to do when the existing nuclear power stations close and what to replace them with. That is a large part of the answer to the question about the difference in Europe.

With regard to the kind of heating that is used elsewhere, if it is storage heaters, perhaps they are more efficient than the ones that we have here, which are notorious for not working well. We mentioned prioritising rural areas because heat pumps should be more effective there, but there is still work to do on that. I hear people talking about heat pumps not working as well in our damper climate as they do in other places—even in Scandinavia. I am not sure about that and I am a little worried about it. There is a question about the effectiveness here and what manufacturers can do about it.

On the question of where the electricity comes from, I mentioned the French and Norwegian context, which is a big answer to the question of why there is so much electric heat in those places. We are doing well in developing renewable electricity generation, and there have been fantastic reductions in the cost. In the most recent round of auctions for contract for difference for offshore and island renewables, astonishingly, the cost came in at around £40 per megawatt hour. Relative to what we were expecting, even five years ago, that is amazing. One or two people have suggested that onshore renewables would now be lower than that.

Is there a need for a contractual framework to underpin it? I suggest that there is. It is still a challenge to get enough of the energy bought ahead of time, in order to give confidence in the investment. That suggests a CFD-like arrangement for onshore wind. It is not a subsidy; it provides a contractual confidence base. Nevertheless, people are trying to develop onshore wind on a commercial basis.

One big issue with renewables is the variability. That is acknowledged in the CCC's "Net Zero" report. Looking to the 2040s, we have to manage that variability. A credible scenario is what we call mid-merit generation, which is dispatchable and can ramp up and down to fill in the gaps. It would have to be low carbon; it might need to burn hydrogen that has been manufactured in a reasonably low-carbon way. The 2040s are not that far away. Given the lifetime of gas turbines, we must address that seriously in sufficient time.

Making things more interconnected would also help to manage variability. We might have a surplus or our neighbours might have some spare availability. As committee members can imagine, if there were a connection with Norway, the Norwegians could save their hydro and sell it to us or we could sell them our surplus wind, so there could be mutual benefits. There have been slight

hold-ups and one or two projects are now on hold because of uncertainty over Brexit, but we hope to get over that delay and get some certainty back in there. I hope that that will answer some of those questions.

Something else that comes up a lot but has not really been tackled is the issue of cost. At the moment, our best estimate is that the measures that we have been discussing—energy efficiency, heat pumps or whatever—are more expensive than gas supply. Incidentally, another reason for our being in the position that we are is that—as others, including Fabrice Leveque, have said—we have so much heat. Some 80 per cent of our homes are run on oil or gas. The only other country in Europe that does that as much as us is the Netherlands, so it would be interesting to look to that country to see what else it is doing.

The CCC's estimate is that getting to net zero would cost some 1 to 2 per cent of gross domestic product over the period to 2045 or 2050. That does not sound like a hell of a lot, if I might put it in those terms. However, we must admit that it is a significant cost.

There are two further aspects of cost that we should think about. One is how much the costs of the different technologies might come down. I expect the cost of installing hybrid heat pumps to do so, although there is not a big market for them at the moment. I am not sure about the cost of installing conventional heat pumps, but it is to be hoped that it will come down. On a lot of the technologies that involve hydrogen, which might become cheaper, we can only make best estimates at the moment. We are hoping that we will see trends similar to those that we have already seen on wind generation.

One of the biggest policy questions is how we then recover such costs. On whom should they fall, and in what ways? We cannot deny that there are costs, but how should we split them? We have to do it, because the climate emergency is real. Should they fall on individual consumers, on the basis of the kilowatt hours that they consume, or should we somehow socialise them? We have also talked about grants. How should we pay for those, and on what basis should they be formed? Should there be just grants or a combination of grants and loans towards the capital cost? Should they be recovered from levies on other sectors, to give them an incentive? The approaches that could be used might involve either carrots or sticks.

Therefore the major questions are about where the costs fall and what instruments we, as policy makers, have either here or at UK level.

The Convener: I think that John Mason wants to come in on one aspect. Jamie Halcro Johnston also has a question.

John Mason: Some of what I was going to ask has been covered, but I would like to follow up on the points that have just been made about costs. There is the cost of the actual infrastructure and so on, and then there are running costs. Is the way in which different infrastructures are treated for the purposes of business or non-domestic rates fair at the moment, or is movement needed in that area?

Professor Bell: I would not consider myself an expert on that, so I will look to any other panellists who might want to come in on that point.

Fabrice Leveque: The treatment of heat networks is absolutely not fair. One of the key issues for that sector is that the way in which business rates are calculated for them varies from the method that is used in the case of there being individual gas boilers in buildings. The cost can be twice as much, if not more. If a customer is choosing between a heat network option and a standard gas boiler for a large commercial building, or several such buildings, the business rates bill would be prohibitive to the point that it would prevent a lot of potential heat network projects from moving forward. I am glad that the issue has been raised, because it is key. The Scottish Government currently applies a 50 per cent discount on business rates for heat networks, but the authority for that has to be renewed by the Parliament every year. That does not give any visibility to large projects that take several years to complete, so it is preventing a lot of them from happening.

John Mason: I will make a more general point. Professor Webb mentioned the need for plans, but I am still a bit unclear about those. There is clearly an urgency, but do we need a city such as Glasgow to say that it will go down the electric route, including in all its housing, while Edinburgh might choose to go down a different route? Alternatively, can we just leave it to the fact that, in Glasgow, the university intends to have a district heating system but other organisations might have biomass, or electric heating in multistorey buildings? Do we need to plan in more detail in those areas and might we even need to dictate to building owners what they should do?

11:15

Professor Webb: In relation to planning, we have the beginnings of the framework in place through the energy efficient Scotland programme and the proposal to introduce local heat and energy efficiency strategy creation as a statutory duty or power for local authorities. The idea behind that proposal is that local authorities should work

in cross-sector as well as multilevel co-ordination in collaboration with the Scottish Government as well as wider interests and, on the commercial side, the energy utilities.

For instance, in Glasgow, one would expect to see a strategy and an implementation plan that showed zoning for different approaches. One area might be zoned for district heating development, which Fabrice Leveque mentioned, and we already have some of that in place to build on in a city such as Glasgow. Another area might be for the electrification of heat—perhaps air-source heat pumps or some other electrification solution—one might be for gas hybrid heat pumps in the first instance and another might be used for a trial run of a hydrogen network.

We can look in detail at the current potentials in some areas. I think that it was Teresa Bray who referred to Orkney, where there is a surplus of electricity production relative to current demand, so there is an opportunity to do rather different experiments there. At present, Orkney is part of the demonstrators for the prospering from the energy revolution challenge, which is part of the industrial strategy challenge fund. There is a lot of long terminology in this area but, basically, Orkney is trying to test the potential for energy efficient solutions by integrating across heat, power, transport and storage and using digital technologies to manage that.

John Mason: When should Glasgow or Orkney make the decision about the direction that they will go in? Should it be this year, or in 2025?

Professor Webb: I would argue that we need to start now. That is in train through the proposals for energy efficient Scotland. We should not sit back and think about when to start. There are some pilot developments. The energy efficient pilot programmes have looked at local heat and energy efficiency strategies, including in the city of Glasgow, but at present we do not have the means and, critically, the resourcing behind those to make them comprehensive and to develop the implementation behind them.

In our interviews with local authorities, they say, "This tells us some things, but mostly what we already know." We need to go further. It needs to be more comprehensive. We need better data and we need to plan on the basis of the eventual performance of those replacement systems, whether hydrogen, district heating networks or electrification, because we know that in practice we are not meeting the standards that we set ourselves. There is a gap between the standard and actual delivery. That is a big skills and training programme.

John Mason: So it should be in a year, basically.

Professor Webb: Start now.

The Convener: There was mention of Orkney. Does Jamie Halcro Johnston want to come in on any of those points?

Jamie Halcro Johnston: Yes. As an Orcadian, I am always delighted to hear Orkney's success being highlighted. I will come on to that. First, how do people feel in general about the success of the local heat and energy efficiency strategies? What is being learned from that? More widely, planning has been mentioned as an issue. What barriers to heat networks are there in the planning system? Should there be exclusions or should heat networks be considered as permitted developments? I would be interested to hear people's thoughts on that.

Fabrice Leveque: On the local heat and energy efficiency strategies, and going back to Jan Webb's point, it is important that those provide clarity about what the future options are. However, as we have heard today, there is a lot of uncertainty about what the solutions will be.

Where there is less uncertainty, we need those strategies to be implemented and to lead in to policy. I would flag up that the local strategies, if they are to be more than just desktop studies, need to have some policy attached to them. Again, the obvious candidate is heat networks. We know that we need to roll those out in the areas of our large cities that are suitable. We would like the heat networks bill, or some other mechanism, to provide exclusive zones for developers, whether they are in the public or private sector. Those zones should be clearly identified in the local heat and energy efficiency strategies.

Local authorities have done a lot of studies and analysis, but those come alive only if there is some policy attached to them. If the Scottish Government can start to join up the various bits of work that it is doing on heat networks, which would be the ideal candidate, we might start to see a bit more follow-through in other policy areas.

That leads us on to planning. The local strategies can also show where new-build developments are suitable for heat networks. Again, there needs to be a link from the local strategy to a local development plan. There is an easy thing that the Scottish Government could do. A review of the national planning framework and the Scottish planning policy is coming up—we will feed into the process, but we are currently not seeing any joined-up thinking. The local heat and energy efficiency strategies remain mostly desktop exercises. It is important that we get those right, but we must not lose sight of the fact that, ultimately, the aim of those strategies is to implement change and develop some policy.

Jamie Halcro Johnston: You said that there is a lack of joined-up thinking. Is that perhaps because different voices are weighing in with different opinions, or is there a consensus in the sector on what needs to be done?

Fabrice Leveque: To be frank, it is partly because of the amount of resource that the Scottish Government has at its disposal to work on this policy area. We have been developing those strategies for three years, during which there have been changes in staff at the Scottish Government. As you have probably gleaned from today's discussion, it is a difficult area of policy, and it needs to be resourced better both in central Government and at local authority level.

There is a lot of consensus, but we need leadership and a clear goal at the end of the process. In the Scottish Government, enthusiasm for the policy area has waxed and waned. I hope that one of the benefits of declaring a climate emergency is that, once and for all, it can be made a priority and we can get on and do it. Interest in the area has fluctuated.

The Convener: Elizabeth Leighton wants to come in. Anthony Kyriakides, do you want to come in as well?

Anthony Kyriakides: Not on this point, actually. I raised my hand a bit earlier, in response to John Mason's point about taxes—

The Convener: Do you want to cover that now?

Anthony Kyriakides: I wanted to add one point about VAT. Recently, HM Revenue and Customs made a change to the VAT that is applied to energy-saving materials: things like insulation and renewables systems. It had to do that in response to an EU diktat, although I believe that it challenged the decision. That change has served only to increase the cost of the systems. Previously, for retrofitting a heat pump, a biomass boiler or insulation, the VAT rate was set at 5 per cent; it has now gone up to 20 per cent. I wanted to emphasise the fact that Scotland needs to have control of certain mechanisms, so that it can say, "This is how we're going to try and address some of these changes that are making it harder rather than easier for people to afford things."

The Convener: I will bring Elizabeth Leighton in now.

Elizabeth Leighton: I want to come back on the questions about Europe and about cost. On Europe, it is useful to look at those European countries, such as the Netherlands, that are in a similar situation to us, with a big reliance on gas. The Netherlands has taken the decision to fully decarbonise away from the gas grid. It is going to disconnect communities from the gas grid and replace the heating with low-carbon heating systems, be they heat networks or heat pumps. It has made a commitment that 1.5 million homes will be disconnected from the gas grid by 2030, and that experience will inform how it deals with the rest of the country. That commitment will cover all buildings. It is a huge commitment, and we can learn from how the Netherlands has approached the issue.

Another case study is Ireland, which has already decided to ban new oil boilers from 2022 and new gas boilers from 2025 in new homes. We are hardly at the cutting edge in Scotland. There is a long list of other countries that have made big commitments in that direction, and we could show more leadership.

There is no getting around the fact that it will cost a lot to decarbonise our buildings, but we know that that is absolutely central to achieving the decarbonisation objective. As I said earlier, if we take a macro-economic point of view, doing so is the least costly pathway and, if we do not spend the money on doing it that way, it will cost more to do it another way. We have to own up to that and say that, for the public good, there is good cause to subsidise or incentivise and to direct public infrastructure or revenue spend towards supporting it.

In some cases, we will be able to decarbonise our buildings not with new money, but by repurposing existing programmes. I will give the committee a small example. The warmer homes Scotland programme, which is a fuel poverty programme, now funds fossil fuel heating boilers. Should we be doing that? Why are we doing that when we know that we want to go in the other direction?

We can also look at investment differently—for example, the capital costs might be high but the running costs are not. We can solve the problem of fuel poverty and all its ensuing costs, not just to individual lives but to Scottish society, by helping with up-front investment. We have called for the budget for the domestic side of the energy efficiency agenda to be double what it is now. We had a commitment in 2015—four years ago—that energy efficient building would be an infrastructure priority, yet the budget flatlined. If it is really an infrastructure priority, the budget should be climbing steadily to meet new targets for fuel poverty and climate change. We have called for an annual budget of £240 million and for that to rise to meet those targets.

In the committee's pre-budget scrutiny, I encourage you to look at the figures bearing in mind what you heard today and, also in the light of the evidence that you heard today, to explore what is happening with the heat decarbonisation plan that is due out this summer.

Teresa Bray: I will respond on local heat and energy efficiency strategies, which operate at a variety of levels, including, by Glasgow City Council, at whole local authority level. Changeworks is particularly involved in taking a much smaller area—Peebles and the surrounding area—and looking in detail to see what can be practically done on low heat and energy efficiency.

Some measures are longer term, such as with waste heat and the water network, but we have got to the level of identifying other opportunities. There are a fair number of new-build properties in West Linton that are approximately 10 to 15 years old, which, originally, had oil boilers put in because they are off the gas network. People are now looking to replace their boilers because the boilers are coming to the end of their lives. As part of the delivery mechanism of the energy efficient Scotland transition programme, we are looking to put in place self-funding of air-source heat pumps to replace the boilers.

We really have to go down into the detail to see opportunities that we can take advantage of. We are not talking about grant funding—okay, often, the work is done in Edinburgh's commuter belt—but support is needed from the energy efficient Scotland transition programme and home energy Scotland for people to make a step change. People are looking to invest and there are economies of scale, because, if 20 or 30 air-source heat pumps are put in in an estate, there will be contractors working there and bulk purchases can be made. That will make a difference, but there is a need for support.

Another point to make is that it will take time to develop strategies. There will be local authority-wide strategies for heat networks, but a granular approach will also be needed to look at energy efficiency, particularly when properties are off gas.

Jamie Halcro Johnston: The lack of awareness of the opportunities that are out there has come up a number of times. That has also been raised with me in Orkney and Shetland, which are areas of high fuel poverty. How do we increase awareness about the opportunities that exist to get involved with air-source heat pumps, better insulation or whatever it happens to be? Are there too many initiatives and too many voices? Should there be just one organisation that pushes things? What approach should be taken?

11:30

Teresa Bray: It is interesting to compare what happens in Shetland with what happens in Orkney. They are different communities. In Shetland, it is very much controlled by the local authority. In Orkney, because there are a lot of demonstrator projects, there are a wider range of things. Local organisations are becoming involved and Home Energy Scotland has more activity there. That is partly to do with openness to the idea that local authorities have a key role, but they cannot deliver everything. They need support to deliver, including technical expertise to help them on their way, and they need to increase their view of what can be achieved.

There is huge potential with regard to off-gas properties, particularly in the islands. Shetland has one of the largest district heating schemes in Scotland, but it is burning plastics from the oil and gas installations. That has to be changed. We already have the infrastructure there, but how are we going to repurpose it and combine it with what else is happening? We need to consider that bigger picture and ask how we can increase the horizons for what can be achieved.

There is no single thing that will sort out all the problems, but an oversight body could look to support the local authorities as well as the community approaches. There is such a variety of things taking place and the right solution for Shetland will not be the right solution for Glasgow, but there are many common practices, including technical approaches to combining with the district network operators, that can be supported in order to achieve what we seek.

Dean Lockhart: I have a question on the future of the energy sector in Scotland and how it may evolve over the next couple of years. We have new agencies being established that will have an impact on the energy sector. The overriding mission of the Scottish national investment bank will be to deal with the climate emergency and there are plans to establish a publicly owned energy company to reduce fuel poverty. Both agencies might be established over the next 12 to 18 months. How do you see them getting involved in tackling the climate emergency and helping to address the Scottish Government targets?

Fabrice Leveque: First, I will touch on a previous question. I have a simple suggestion on how we can advertise the change to consumers and householders. The energy efficient Scotland programme should lead to a specific Scottish household assessment that is a bit like an energy performance certificate assessment but is a bit more detailed. However, we have not yet seen any evidence that it will focus on anything other than fabric efficiency. That is important, but if we are going to hit the timelines, we will need any communication with householders to talk to people about what their boiler systems will have to be like in the future. That could involve telling people that they are in a heat network zone or, if they are off the gas grid, that their oil and LPG systems will have to change. That will be a relatively simple

change or tweak and, arguably, it should be happening now.

On the question about the new agencies, we have been exploring whether the Scottish national investment bank could provide a larger amount of low-cost capital to local authorities that are trying to deliver heat networks. Although they have access to things such as the Public Works Loan Board, that is, in reality, quite closely guarded by other bits of local authorities. We would like SNIB to investigate whether it has a role to play in providing a much bigger pool of funding.

As with all renewables, there are a lot of up-front capital costs. Whatever we can do to reduce those costs will go a long way towards making the technology cheaper. In offshore wind, some of the biggest cost reductions in the previous few auctions have happened because there has been access to much cheaper finance, and that is because the technology has been seen as being lower risk.

The Convener: We are coming to the end of our time. I will give our guests the last word, as it were, if each of you has something to contribute on the last few points that we have been discussing. We will go around the table, starting with Teresa Bray.

Teresa Bray: There is a need to ensure that the policy framework is in place and that the funding follows through. Elizabeth Leighton mentioned the need to support Energy Efficient Scotland and follow through on the commitment that has been made. We need to ensure that there is continuity and that we learn incrementally rather than chopping and changing. We need to continue with our Energy Efficient Scotland transition plans, but we also need to start planning ahead for heat networks.

I am positive, although Anthony Kyriakides might say that I am being too positive. Scotland led in the industrial revolution and we can lead in the low-carbon revolution as well. By committing to the policy framework and delivery and examining the hurdles, we can achieve that, to everybody's benefit. There will be some challenges, but I am sure that we will achieve it.

Anthony Kyriakides: There are about 600,000 homes that are off the gas grid, which I think presents a perfect opportunity to develop a supply chain for low-carbon heating systems at a mass scale over the coming five years. Signalling that traditional fossil-fuelled heating systems cannot be installed after a certain point—I suggest by the mid-2020s—will drive that. That would bring in economies of scale and drive down prices and the supply chain will ramp up, which we believe would be a perfect way of leading into the following five years. Whether we have hydrogen decisions or not, that would put us in a really good position. Making people aware of their options through the supply chain or other mechanisms would also help to drive the change that is required.

Professor Webb: To respond to the question about the Scottish national investment bank and the publicly owned energy company proposals, it is essential that the bank is at the heart of low-carbon infrastructure development across the energy sphere, as well as our building stock, which I would count as critically important low-carbon infrastructure. Therefore, the bank has to be involved in the retrofitting programme.

I would hope that the bank emulates the best practices of publicly owned infrastructure banks in other places, such as the German example. We have seen how progressive that is in encouraging renewable heat in Germany, for instance, with the development of infrastructure through low-cost loans, blended finance and a number of financial instruments. Therefore, the bank has to play a critical role in enabling and speeding up the process.

Similarly, and drawing on some comparative work that we have done with German cities, I would hope that a publicly owned energy company would be at least as effective as some of the German stadtwerke—the big municipal enterprises—which have been able to build on economies of scale from operating across waste water, local energy systems and so on, to capitalise on what can be done if all the pieces are brought together.

Euan McVicar: I very much agree about looking at the German example when it comes to what the Scottish national investment bank might do. A lot of the models that KFW has implemented would allow customers and consumers to fund their own investment in the infrastructure that they will need. That is an interesting model to follow.

On the local strategy documents, a lot could be done there to assess what is the most effective solution in particular circumstances, and to allow a good evidence base to be drawn up across a particular area. That would then feed into the national discussion that needs to take place about what is the most effective route for decarbonisation. We must always come back to look at what is going to deliver the biggest impact on decarbonisation of heat, because the consequences of how we heat our homes and our industries are huge. Finding the best and most effective way of answering that question needs as much evidence and data as possible.

Professor Bell: As others have said, the local energy plans are really important in identifying the right solution in the right places. From this and other discussions, there seem to be three main

obstacles. The first, which Professor Webb mentioned, is the resourcing and getting the local authorities tooled up in terms of their capability. The second obstacle is data and whether they know what the circumstances are, so that they can be confident about making a decision. The third, which Fabrice Leveque mentioned and which Professor Webb touched on as well, is the access to finance. To echo what others have said, the Scottish national investment bank seems to represent a really important opportunity in that respect, but we still need to address the tooling up of the local authorities and the access to data and knowledge. We often say that they need to have the confidence to then get on with it. Anthony Kyriakides's point about off-gas heating is also a really important one.

One thing that we have not mentioned with regard to costs is that there are some co-benefits, such as comfort in homes and the health benefits that come with that. There is perhaps a bit of nervousness about the use of biomass due to its emissions, so I would say do not be too hung up on biomass. However, if people are out of fuel poverty and have a heating system that works, their health should be a lot better as well.

On the idea of a publicly owned energy company, the Scottish Government needs to be clear about what it is doing. I do not see any evidence to support the idea that it can set up and be a supplier that is somehow much cheaper than the existing market. The two or three companies that have been set up on that basis have really struggled and we have seen lots of new-entrant suppliers go bust over the past year. However, the sort of thing that was mentioned by Euan McVicar and Jan Webb about how the company could help to underpin capital investment and to identify and perhaps fill the gap in capability that local authorities have seems to represent an important opportunity.

My last wee point is about who we should get the message out to. We certainly need to inform householders in some way, but the installers are the best people to talk to. I will give one small example. My gas boiler gave up recently and was condemned, so I had to make a quick decision about what to do to get some heat in my home. I spoke to my normal plumber, who spoke to his mate the gas fitter, about a hybrid air-source heat pump solution, but they said, "We don't know anything about that. Can't help you." Luckily, I knew a few other people whom I could talk to and I asked around a bit. If they had known about such solutions and could have said, "This is how you do it and this is what it will cost you. That may be a lot, but perhaps you can get a loan or a grant", I might have been more likely to go for it. I had to go for the immediate solution of installing a new gas boiler, but people have told me that I can retrofit a heat pump. Watch this space to see whether I go for it.

Elizabeth Leighton: I can only echo the highlights. The key point I will leave you with is where I started; it is not just about renewable heat generation but about demand. That has been covered very thoroughly and that should appear in future heat policies and a refreshed climate change plan. On budget, more investment will clearly be required, and the capacity to deliver the programme. We recommend that an independent body is set up to do that.

Lastly, we are in an incredibly rare moment of opportunity, in which the public are with us. They want warm and climate friendly homes. They have heard about them, including from their neighbours, and the momentum is with us. We need to ride that and make the most of it with a really positive and engaging campaign, as Anthony Kyriakides mentioned, that will give people a helping hand along the way so that they can do their part to contribute to decarbonising our homes.

The Convener: I thank all our guests for coming today. That completes agenda item 3.

11:43

Meeting continued in private until 12:47.

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