

Energy Security and Net Zero Committee

Oral evidence: [Heating our homes](#), HC 115

Wednesday 28 February 2024

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Members present: Angus Brendan MacNeil (Chair); Vicky Ford; Barry Gardiner; Mark Garnier; Mark Pawsey; Dr Dan Poulter; Alexander Stafford; Derek Thomas.

Questions 501-605

Witnesses

I: Mark Crowther, Fellow, Institution of Gas Engineers and Managers; Robert Nitsch, Delivery Director, Institute for Apprenticeships and Technical Education; and Aadil Qureshi, CEO, Heat Geek.

II: Dr Ciaran Byrne, Director of National Retrofit, Sustainable Energy Authority of Ireland; Jenny Curtis, Managing Director, Vattenfall Heat UK; Adrian Joyce, Secretary General, EuroACE; and Kieran Sinclair, Principal Energy Policy Advisor, Embassy of Denmark.

Written evidence from witnesses:

- [Institution of Gas Engineers and Managers](#)
- [Vattenfall](#)
- [Embassy of Denmark](#)

Examination of witnesses

Witnesses: Mark Crowther, Robert Nitsch and Aadil Qureshi.

Q501 Chair: Good morning, and welcome to the Energy Security and Net Zero Committee. This is the fifth session in our heating our homes inquiry. We have two panels this morning: the first panel focusing on workforce and skills and the second on international perspectives. The first panel is with us and before us. I will ask all witnesses to introduce themselves as they see fit. Name, rank and serial number, starting on my left.

Mark Crowther: I am Mark Crowther, a fellow at the Institution of Gas Engineers and Managers and hydrogen director at Kiwa.

Robert Nitsch: Good morning, My name is Robert Nitsch and I am the delivery director at the Institute for Apprenticeships and Technical Education. We convene employers to design, approve and assure technical qualifications, including apprenticeships.

Aadil Qureshi: Hi there. I am Aadil Qureshi and I am chief executive of Heat Geek, a national network of heating engineers helping homeowners to decarbonise their homes.

Q502 Chair: Welcome. It is good to see you all. To kick off with Robert Nitsch, do the Government and industry have a clear picture of where skills challenges exist in the home heating and retrofit workforce?

Robert Nitsch: The institute generates products, so clearly, it is really interested in what skills are needed for the future, in foresighting and anticipating those skills needs, and also making sure that the workforce we develop has the necessary skills to adapt to that. I think the Government have a number of priorities that we respond to, of which the green economy is one.

Q503 Chair: Do you think Government announcements appearing at least to signal a change in tone—if only that—has a ripple effect on industry?

Robert Nitsch: Are you asking about whether, when the Government make an announcement, that influences what happens on the ground?

Chair: Yes. I am thinking in particular of the September announcement, when it was widely trailed that the Government were rolling back a little on some changes around net zero.

Robert Nitsch: I cannot really comment on that particular announcement, but we do see that Government interventions make a difference to how people take up or take forward their investment in skills. There are multiple ways that they can influence that. However, that announcement was only made in September and it takes quite a long time for these things to filter through.

Q504 Chair: Mr Qureshi, Governments often talk about market forces, but some people counter and say that Government are the biggest force in the



HOUSE OF COMMONS

market. Any thoughts?

Aadil Qureshi: We have homeowners coming to us every day seeking advice, insight and support on how to decarbonise their homes. The boiler upgrade scheme has been a massive propellant to that, I think, and has been a huge help for homeowners to make the business case where one is to be made. On the other side of the industry, we have engineers who are looking to further their careers and businesses looking to grow their businesses and skills, and we believe there is an interplay between Government policy and that demand. We really focus on building an amazing product both for our engineers and for the homeowners they serve, and in so doing allow those market forces to override or counteract any short-term aberrations in the strategy that the Government put forward.

Q505 **Chair:** Thank you. Mr Crowther, are there clear pathways for how the existing workforce can be retained and upskilled in new roles and technologies? I am thinking particularly of heat pumps. I hear a lot of people say that for some older engineers or installers, getting a handle on heat pumps is not uppermost in their mind.

Mark Crowther: It certainly isn't. I totally agree with that; it certainly is not. If you are 40, you think, "Well, the gas industry"—the current natural gas—will see me out anyway," and if you are younger, you have probably borrowed the £5,000 from your parents or something to go on a low-carbon heating course, but the thing you really want is your Gas Safe ticket, because that enables you to earn good money, day in, day out, changing condensing boilers or doing landlord certificates.

Getting more training in the greener technologies is a matter of market pull as much as trying to push people down it. Imagine you are a young man of 30. You have the opportunity to put in a couple of condensing boilers in a day, but for a heat pump you have to make speculative visits. Say you get a call. You have to do a design, which might take you half a day if you have the skills to do it. The design is speculative, and you can't be out on the tools earning money while you do it. We know that there are more callbacks on heat pumps, simply because of the complexity of their installation, and fundamentally because of their low operating temperature.

M'learned colleagues on my left will explain, "Oh, we can do it right; we have all the skills," but if you talk to electricians who have tried to put heat pumps in—the industry is awash with not just anecdotes but really strong knowledge—they say, "Oh, we put one in at 13 Elm Avenue and it had to come out because it didn't work very well," or they fall out because they are frightened of their Trustpilot ratings. It is just a high risk. Why would you try to push a heat pump when you can make good money banging out condensing boilers?

Chair: You are saying that there is a tension. Okay Mark, you come in.

Q506 **Mark Pawsey:** You spoke about the time taken to install a heat pump because it operates at a lower temperature. What about the high



HOUSE OF COMMONS

temperature heat pumps that are now available? Why is that not a more effective solution to the problem, and why can't the existing gas engineer simply replace the gas boiler with a high temperature heat pump?

Mark Crowther: Because he doesn't tend to believe in it. Those high temperature heat pumps tend to affect the COP. I know that theoretically they don't, and you can show me lots of data to show they have high efficiency, but in practice, to the ordinary homeowner, they do. You have to be a lot more skilled as an installer and you have to take more risk. If the person has used microbore for the ground floor bathroom at the back, you think, "This is quite a risk. It's a 10 mm pipe—will I get away with it?" We need to bear in mind how averse lots of people are to risk. This guy is actually stumping up his own money to take that risk or not, and the householder will get cross.

Q507 **Chair:** He is even worried about the microbore at a high temperature?

Mark Crowther: Yes, because it is 55° rather than 80°. He'll get away with it when it's 80°, but he probably won't with 55°. And then you have the system balancing, and you have to have space for a buffer tank and a domestic hot water tank. The householder is used to a combi whereby they have limitless hot water, and they are suddenly going to a domestic hot water tank, which they have to find room for. My daughter has just taken out her domestic hot water tank because she wants to put a bicycle there.

Q508 **Chair:** So she is helping the environment in one way but not in another.

Mark Crowther: Spot on. I couldn't have put it better myself.

Chair: She may be carbon neutral once she's done, but everybody else wouldn't be.

Mark Crowther: I thought it was a good example.

Chair: Fair enough. Mark, do you want to continue?

Mark Pawsey: No, that's fine.

Q509 **Chair:** It is puzzling. Looking at some of the data, France, for instance, and the Nordic countries don't seem to have these reservations about heat pumps and are using them very well. I think France had 12 times the installations of the UK in 2022.

Mark Crowther: Certainly friends of ours who have retired to France have a big wood burning stove and a heat pump as background heat. I may not be correct, but I think in Scandinavia you have to install a wood burning stove anyway alongside your heat system. Certainly in France, everyone we know has a wood burning stove if they want one in the middle of winter. That is just not practical in Winchester.

Q510 **Chair:** Does anyone else have any comments?

Aadil Qureshi: A few. I appreciate Mark's comments. Just to bring some statistics into the room—again not from some far-flung report but from



our own experience—we have trained 2,000 engineers, which is a small step on a long journey. These engineers have come to us. They are existing gas engineers who are still making money with the gas system, as Mark mentioned, but they see a future in which domestic electrification can not only provide them with additional skills—which, by the way, are useful in the context of the new part L regulations for gas systems to make them more efficient as we transition over—but give them the opportunity to earn more money, and to be a pillar of their community and a place to go for advice and services.

We are, frankly, awash with inquiries from engineers who are in that camp. I am not here to say that that is the entirety of the market—I believe Mark's comments apply to some folks. But we are tangibly and specifically equipping engineers with digital training that does not need to take them off the tools or put them into a training course, and enables them to not just install future systems such as heat pumps, but advise their community on the matters we are describing here, because, fundamentally, that is who homeowners go to.

Q511 Chair: I wonder if there is a bit of a misunderstanding of heat pumps here versus the European context. Say you have a heat pump throwing 10 kW into a house and a gas boiler throwing 30 kW into a house. It is more energy intensive, rather than a background hum. If your house is losing 5 to 6 kW of energy, it will inevitably take longer to get your heat up. Is there an issue of the way homes are heated by boilers and heat pumps being misunderstood by homeowners here, rather than in places where it would appear, at least on the surface, that heat pumps are successful?

Aadil Qureshi: Yes. Nesta did a recent study and found that people who had heat pumps in the UK were absolutely fine, to summarise it very glibly. The misunderstanding is manifold, which is why we have launched a Heat Geek YouTube channel. I encourage Members to check it out—it's the most popular heating engineering YouTube channel in the world.

Chair: Will there be any commercial royalties?

Aadil Qureshi: No royalties, no advertising.

We explain basic concepts on the YouTube channel. A 30 kW gas boiler does not put out 30 kW of heat. That is a misunderstanding. It does so for the hot water. To balance the heat demand of a property with the output of a heat pump is all that is required in order to get a heat pump working. It is an equation of heat loss versus the output of the heat pump. If your heat loss is too high, you should insulate, and you can insulate fairly minimally in order to bring the heat loss down. If you live in Windsor Castle, that might not be quite the case, but there is a huge bell curve of the homes in the UK where heat pumps work. We have hundreds of installations under way and homeowners who are incredibly satisfied.

Another aspect Members should understand is that at the same time as electrifying heat, we are digitising it. We are connected via an API and the network technology to every heat pump we install, so we can see the exact efficiency and the standard of the temperature the home is



HOUSE OF COMMONS

achieving, and project on issues that homeowners may be facing before they manifest.

Q512 **Chair:** I am about to hand over, but I saw Mark shaking his head—if you'll indulge me, I do enjoy a disagreement on the panels. Before I hand over to Vicky Ford, Mark, you've got until about 10.13 am, if you can see a clock, to say what you want.

Mark Crowther: This digitisation is just too complicated for the man in the street. He and his wife have busy lives. Often, the internet goes down, but you don't want your heating to go down. It's wonderful if you are a genuine green enthusiast—perhaps that has the wrong connotations. We have to decarbonise by 2050, but we need to do simple stuff. We modelled a block of flats in Hackney where they had problems because each flat weighed 60 tonnes of concrete, and they had fitted a 3 kW heat pump. That is the amount of energy you get off your front hob, and you're going to heat 60 tonnes of concrete? Can you imagine the weight and trying to heat that? Of course, you can do it, but if you let the flat go cold because you couldn't pay your electricity bill, it will take you three days to heat it back up, or you are on the immersion heater override, which costs you £2 an hour, or something.

Chair: Thank you for that. Vicky, over to you.

Q513 **Vicky Ford:** Before I start, I have a declaration of interest. I am very proud of the new purpose-built facility at Chelmsford College to teach construction and environmental technologies. A fantastic person cut the ribbon when they opened it—I can't think who it was.

Chair: Was it by any chance Vicky Ford?

Vicky Ford: I have another declaration of interest: I am particularly grateful to Heat Geek. Some of you know that one of my constituents had a very bad experience having a heat pump fitted. Heat Geek sorted it out, and I am hugely grateful. My third declaration of interest on this heat technology is that I love digitisation; I love being able to turn my home heating up and down from my phone. It makes a huge difference that I am not heating my home when I'm not there.

Aadil, does the Government have a plan to increase the array of courses offered by education and training providers in low-carbon technologies and home retrofit?

Aadil Qureshi: We were just discussing this outside. We are incredibly excited about the array of work going on in this space. Robert and his colleagues are working on the new apprenticeship standards launching this year—the low-carbon heating apprenticeships and so on. MCS is involved in that as well. We are incredibly excited about that stuff. Most training colleges do offer low-carbon courses.

The only slight gap is the recognition that attending a course, sitting at the back for three days and having your name ticked off on a list bears no comparison to achieving the outcomes that we can measure through the technology on an ongoing basis. We offer digital training courses for



HOUSE OF COMMONS

engineers who want to learn around their work but don't want to take time off the tools—who want to be able to dip in and out of the training, using engaging video content, like you will find on our YouTube channel.

Chair: Is that heatgeek.com?

Aadil Qureshi: You can see it through heatgeek.com or go to YouTube and search Heat Geek.

As you mentioned in relation to your constituent, Vicky, these are engineers who are deeply passionate about their industry. They are perhaps less tied to technology A or technology B; they just want to achieve great outcomes for their homeowners. The slight gap that we see is the recognition that in 2024 alternative learning styles may unlock the scale that is required for this challenge. Again, I point to digital training in as much as I point to digital outcomes measurements.

Q514 **Vicky Ford:** We all learned a lot about the pros and cons of online learning in the pandemic—and there were pros as well as cons.

Robert, will you set out how you work with training providers to ensure that courses and qualifications are consistent—we want installers who are consistent—and how we make sure that those courses are attractive and really match what the sector needs?

Robert Nitsch: The first thing to say is that we develop the products that we approve with employers. Training providers have input into that, but the skills system is employer-focused and employer-led. When an apprenticeship is defined or a qualification is approved, that is employer-led. That is a demand-led market, which is where we have moved to.

Clearly, we are very interested in consistency of supply. We have quality assurance mechanisms to make sure of that, and Ofqual, Ofsted and other regulators out there looking at delivery are making sure that there is that consistency. Our contribution to that is to make sure that what employers specify is something that is assessable and interpretable, and that strikes the right balance between detail and generalism. The institute is really focused on that quality element of its products, in the same way as it is very focused on delivering against the homes improvement agenda.

The institute started revisiting all its products about four or five years ago. It graded by degrees of green, and we brought in from outside the institute a committee of experts in sustainability in this area, to help us look at our product range and to retrofit that, for want of a better phrase.

We are now very much involved in delivering standards and qualifications that look forward. "Retrofit co-ordinator" is about to emerge, as are "insulating technician" and "district heating technician". We are laying the basis of those courses and qualifications that will build the workforce for the future. We are incredibly focused on that.

Q515 **Vicky Ford:** That sort of makes sense to me if I am thinking about the 16-plus age group and young people starting at the beginning of this



HOUSE OF COMMONS

journey, moving into this trade, but a lot of plumbers and contractors are self-employed, experienced tradespeople, who are used to working with gas boilers. How are you making sure that we have the upskilling for those people that doesn't take them away from their day job earning the money that pays their bills?

Robert Nitsch: That is a really good point. Just to deal with an element of that though, approximately 50% of apprentices today are not new entrants to the workforce—they are people that are upskilling in the workforce. However, to deal with the problem that you have very reasonably outlined, I think that we need a blend of skills solutions. Short qualifications that allow people to get that uplift are really important. We actually commission those and are expanding our ability to do that. And, as the Government skill programme rolls out, particularly with the approval of level 2 and level 3 qualifications, we will see more and more of those courses appear. Therefore I think it is about a blend of options.

Q516 **Vicky Ford:** So using bootcamps?

Robert Nitsch: Yes, that is in there as well. There are qualifications that we approve and there are bootcamps as well, so it is about getting a multiplicity of things that can support people.

Q517 **Vicky Ford:** And do you agree with Aadil about the benefits of online quality learning to give you that upskilling?

Robert Nitsch: Yes. An important thing to note is that different people learn in different ways, and, actually, it is about trying to ensure that we provide a range of options that allow people to realise their potential. Some of that could be online; some of it is blended; and some of it needs to be practical. It also depends on where the individual is in terms of their career journey.

Q518 **Vicky Ford:** You are sounding very positive that the Government have enough different types of upskilling training, and, if not, then you are working on others.

Robert Nitsch: That is what I believe, but I believe that there are other fundamental issues in the system that might make the realisation of that potential difficult, such as the skilled teaching workforce that is needed to deliver it.

Q519 **Vicky Ford:** Mark, from your side, do you think that the range of courses and offers from different education providers are flexible enough for the workforce that you see?

Mark Crowther: Yes, well, we train in biomass—there are not many places that train all aspects of biomass installation—and we also deal with oil and gas. We would like to do heat pumps, but we see no market drag; we do not get installers coming in and saying, "Can you train us how to install heat pumps?" There are 2,000—

Vicky Ford: That's because they are all going to Aadil.



HOUSE OF COMMONS

Mark Crowther: There are 130,000 gas installers—there used to be 140,000 but it has drifted down a bit in recent years—and 200,000 electricians. Some of those electricians will, at various times, have tried to—I'll choose my words carefully—bang in some heat pumps and burnt their fingers. They are quite difficult, and that is the nature of a heat pump, because it is a low-temperature source, even with a high-temperature one. You need all of the technical stuff that I have just been through, which, if you have a client who wants the product—

Vicky Ford: I've got it.

Mark Crowther: But that is not going as far as the people who we have through the door every day saying, "Give me my gas safety certificate" or "Give me my oil ticket."

Q520 **Derek Thomas:** Mark, hello and thank you for coming along this morning. I want to particularly concern myself with apprenticeships. I did an apprenticeship in the building trade many years ago, and it gave me a good set of skills—which I may well need in the near future!

Vicky Ford: No!

Derek Thomas: I've got the bucket of tools ready—actually, maybe I could do this place.

The Government clearly need to do more to make it easy and attractive for people to take on and offer apprenticeships. The real challenge seems to be in whether there are enough apprenticeships around, particularly in the small businesses. Would you agree?

Mark Crowther: I just don't see—I mean, we work with a number of local colleges to do the practical oil, gas and solid fuel part of it. There are a number of quite complicated environmental apprenticeships and schemes that people come on, and they are happy to go off with their gas-safe certificate and go and provide a decent service to people. We just don't see this call from people, apart from if they are real enthusiasts—and I would give credit there; there are real green enthusiasts. Most of the other 128,000—if you have take the 130,000—just want to do a decent day's work for a decent day's pay. It is quite interesting work, a bit of a challenge, and they meet different people; that is why they enjoy doing it.

Q521 **Derek Thomas:** No, I do get that—I completely get that—and I know lots of young people who did apprenticeships and are making a lot of money, as you described. However, if we do want to transition, or even give householders the choice about what heats their home, what more do the Government need to do to actually ensure that there are companies that will take on youngsters—who actually have lived through recent years where they have become quite aware of how they should, and could, care for the planet? Is there more that the Government can do to turn the dial towards youngsters wanting to make that choice?

Mark Crowther: I will come out with my bias now; I am a great hydrogen man, so I would say, through the GDNs and things, if you look at going



HOUSE OF COMMONS

back to the old 1967 to 1977 days, with 13 million homes in 10 years, we will need a lot more training in that area. But I think that just trying to offer more apprentices to get people to take on heat pump courses, when there isn't the market pull—and with the downside of the reputational risk because they installed that heat pump that didn't work until Heat Geek came to make it work—is all grist to my mill, sort of thing, gently.

Q522 Derek Thomas: Do you feel that in time hydrogen will be heating people's homes?

Mark Crowther: Well, I do, but I was the first man who went to see the late Professor MacKay in 2012, so you are asking the wrong man. I have a cunning plan that I am putting to the APPG at 5 o'clock tonight, if anyone is interested.

Chair: Okay, this is becoming commercial central.

Mark Crowther: No, I said the APPG—oh, sorry, okay.

Q523 Derek Thomas: I see that, and I hear people supporting it, but I also hear others saying that you wouldn't necessarily use hydrogen to heat homes. Robert, can I bring you in? What was the process for developing the low carbon heating technician apprenticeship, and is that the solution that Mark is resisting?

Robert Nitsch: The low carbon heating technician took longer to develop than we anticipated. We learn as we move forward in these sectors. As we work on the edge of deliverable technology, it takes a long time to get people to agree what competence is, which is what an apprenticeship is based on—the output standard of an apprenticeship is occupational competence—what the scope of an apprenticeship is and whether it should include digital, and bring that into a coherent shape. That is why it took longer than it should have done. I think we will be quicker as we become more familiar with this and move forward.

It is also important to think about the mobilisation of the apprenticeships. It is not just us approving it; it is colleges developing the detail and bringing the students on board. It is a system; we do not just tick it and off it rips. That underlines a couple of things in your previous question. There are definitely things that the Government can do and that we are striving to do to improve the availability of apprenticeships for small and medium-sized enterprises—70% of the construction sector is SME. We can also do things like improve the assessment and make that easier. Those things are happening now, and we are constantly trying to do them. You should view the apprenticeship programme as a mature programme that is in a state of continuous improvement. We are really focused on that.

I have two other points to make quickly. It is not just having the product; it is the successful delivery of that product. I am the chair of governors at an FE college as well as doing this role, and making apprentices stick with apprenticeships, particularly in areas like plumbing, where it is a bit of a shock when you get to the realities of that, can be a real challenge.



HOUSE OF COMMONS

My final point, which I don't think is implicit in the question—I am just making the point briefly—is that the apprenticeship is not the solution to every skills problem. Where we need something more adaptable, we need to put in a qualification, learn from doing that qualification and potentially back-engineer that into an existing apprenticeship, or create a new one. The quickest way to get an apprenticeship is to adapt one that exists, rather than start from scratch. Of course, we started from scratch on the low carbon heating technician. We have adapted the plumbing to allow them to fit heat pumps—to build that in much more quickly. That illustrates that point.

Q524 Derek Thomas: Do you need the Government to be a bit more flexible on the levy to enable some of what you described?

Robert Nitsch: The institute is not accountable for the levy. We make funding recommendations, but the Government—DfE—holds the authority for where it sits. There is lots of complexity with the levy. As is presented, there is a simple choice of just using it somewhere else, but that rather makes the assumption that apprenticeships are not going to account for it in its existence. It is not necessarily the case that if you do more with it somewhere, you do less with it somewhere else.

Q525 Derek Thomas: I get that. Aadil, can I bring you in on that point? Colleges are doing a great job of putting these courses together, but you need SMEs—small builders and smaller companies in rural areas such as the one I represent—that will take on people who want to do an apprenticeship, work with the colleges and see that through to completion so the apprentice is occupationally competent. How do you address that with what you do? As a precursor to that, are T-levels a helpful direction of travel for young people?

Aadil Qureshi: That is a really good point. I would say that the problem is even more stark than you put it. More than 95% of the industry where a homeowner can change their heating system, almost irrespective of technology—let us put that to one side for a second—is with micro-organisations. We have a brand association with some of the larger companies, but they really account for very few of the actual 1.7 million heating system installs that happen a year. You have to turn the problem on its head, in our opinion.

If we focus on the businesses that are pulling for the apprentices or T-level entrants—new entrants into the market—and give them tooling, training, technologies, governance systems and all the required things to make them successful in whichever technology route they want to go, and there may be a personal bias towards heat pumps for us, that will create the pull from the colleges in. That will create folks who we meet all the time: new entrants into the industry and people who are programmers saying, “Actually, I want to do something about this climate crisis. I'd love to enter the market.”

However, we must have employers. We must have small businesses embedded in communities supported by Government, yes, but also by



HOUSE OF COMMONS

commercial enterprises such as ourselves to easily come into this market, do the more complex things, earn more money and grow their businesses. That is fundamentally the task, and the education pathways that come into that are a secondary result of that core objective.

Derek Thomas: I agree. Thank you very much.

Q526 **Mark Pawsey:** Thank you for introducing us to a new term, Aadil—time off the tools. I think we know and understand what you mean, but it is succinct. That is a problem suffered in not just this sector, but British business generally. I was on the Business and Trade Committee when entrepreneurs were being encouraged to enhance their own skills, and many of them would say, “I can’t do that because I do not have time. I am too busy running the business. I have my head stuck in this.” We have the same issue here. How do we fund and encourage people to put down their tools and not work for days or a week in order to get the new skills to deliver this? You gave us an alternative, which was digital learning. Is that the solution?

Aadil Qureshi: I think it is a solution. I want to be really clear that our target market, if you like, or our contribution to this challenge is existing NVQ level 2+ engineers who have had five, 10 or 15 years of experience on the tools. Whatever you think of people—

Q527 **Mark Pawsey:** Are these currently gas engineers?

Aadil Qureshi: Yes, that is correct. There is an interesting quirk that I learned as I entered this market: even for an engineer who wants to install a heat pump and turn the gas off, one must have a gas safe certificate in order to do so, so there is no challenge—it is not a binary choice between the gas route and the electrification route.

In fact, in order to support our communities through the S-curve of adoption—this technology transition that we will go through—we need people to be able to continue to service, maintain and support those gas systems and combi systems that Mark pointed out, and we fully support our engineers in doing so. We just focus and help them on the new stuff—the heat pumps, the low temperature solutions and the highly efficient designs that enable them to save their homeowners money. We have proven that through our training, we can take existing experienced gas engineers into a world of heat pumps and have them be able to not only install the systems, but do so incredibly well and at a very high efficiency level that unlocks a saving for the homeowner—a financial saving, not just a carbon saving—and lessens the impact on the grid.

Q528 **Mark Pawsey:** So you are helping the homeowner to be better off, but how are you helping the installer to be better off? Are you enabling him to get that learning without needing to take time off the tools?

Aadil Qureshi: Precisely. The system that we use is a self-paced online system. It is used across industries from medicine all the way through to technology, and it enables participants to sign up to the course and take their time. They pay a monthly fee. It is a very small fee, actually; we are



HOUSE OF COMMONS

not aiming to make a huge amount of money from it. However, it gives them the ability to dip into the research and knowledge, understand, learn, do online testing and crucially be paired with a peer community of learners across the country. In this peer-to-peer manner they get access to a community that is far larger than those they would maybe meet on a course at college.

Q529 Mark Pawsey: Is the fact that they will grow their business, enhance their skills and provide themselves with continuity of employment a sufficient incentive? Does it need something like the heat training grant provided by the Government, which is a discount of up to £500 towards the cost of heat pump training?

Aadil Qureshi: We have been beneficiaries of prior grants under the old world of BEIS, and it did help. It was a pull-through. Frankly, our engineers who do our training can, after they have done that certification, sell their services at a premium to the current market. As a result, that fiscal incentive cuts through any green incentive, I would say. Our engineers are making more money and have a better business as a result of upskilling, training and being able to do highly efficient systems. This is the key.

Q530 Mark Pawsey: Robert, do you get a sense of what Aadil is talking about, that the self-interest in upskilling is more important to this workforce than £500 from the Government to do the right thing?

Robert Nitsch: It is difficult for me to judge, whether it is £500 or £1,000 or whatever. I think the true answer is that we need to have a combination of factors. There might be one factor that is dominant for a particular individual and another factor that stimulates somebody else. A lot of learning is self-driven. That is one of the benefits of an apprenticeship; it encourages a lifelong learning approach. It instils that in people. There is a cultural bit to this as well as the hard skills.

Q531 Mark Pawsey: Is this workforce one that is used to continuous improvement? Is it not that they have done their qualifications, got them, and feel they have the right to carry on doing that for the rest of their working career? Is there a culture here of ongoing development?

Robert Nitsch: I am now relaying this to my personal experience as a customer of people who are working in these types of trades. Certainly in the plumbing trade, which is where we are going now, it is constantly evolving and developing, and people are constantly acquiring skills. Whether you move from lead piping to copper piping or plastic piping, it is an industry that is constantly moving and developing. For us, it is important that we keep up with that and make sure that the qualifications we approve reflect the changes in techniques and the modernism.

Q532 Mark Pawsey: Mark, you told us there were 140,000 gas installers and that that has fallen to 130,000. That figure is going to decline over time. How do you feel about the people you represent right now drifting over to be quasi-electricians installing heat pumps?



HOUSE OF COMMONS

Mark Crowther: Electricians installing heat pumps is not a good thing. It nearly always ends in tears unless they have had training with somebody like the Heat Geek, but they go out and do that. As far as gas goes, many of the heat systems that have been put in—the heat emitters and the radiators—are all there already and are copper. They are probably good for a few more years yet. The drift down doesn't worry me too much, and you can change a combi boiler quite quickly. If we are trying to decarbonise the UK, that will have to grow, but it will have to grow from a Government policy decarbonisation route. I do not think that a few training courses are going to wave the magic bullet there. As I said, there are already people who we take through every day—young people who work on apprenticeships and different deals and things. There is a wide range of those nowadays. That is not the issue. If we are going to decarbonise by 2050, the problem is more complicated than that.

Q533 **Mark Pawsey:** You mentioned that you are an advocate for hydrogen and the use of hydrogen in home heating. Do you think there is a dash for heat pumps and we are trying to encourage our gas installers to retrain in heat pumps while the door remains open to continuing to use gas in our heating network? Do you think we train those guys on to heat pumps at our peril, because we then may not have enough people to deal with the hydrogen transition?

Mark Crowther: No, because there is not the market pool for the heat pumps. Do you see what I mean? It is a little like converting from natural. Say your core skill is in natural gas. You can do a hydrogen changeover course in five days. That is not the problem. It is more a matter of which way is the ship heading. Clearly it will not be an all things to all men sort of thing. It is the planning or not planning that is the hard bit we have to get to grips with.

Q534 **Mark Pawsey:** So you are not bothered about this 130,000 people morphing into other skills and the fact that we may not have the people to do the hydrogen?

Mark Crowther: No, because if the money is there, they will come back again.

Q535 **Mark Pawsey:** It is as easy as that?

Mark Crowther: Provided you have your original core skill and the money is there. I am not worried about it.

Q536 **Mark Pawsey:** Robert, you wanted to come in quickly?

Robert Nitsch: There is definitely a labour supply challenge here, which I think is what you are pointing to. I think more people need to be attracted into this sector as a whole. It is not just about retraining. If there is not a significant uplift in the number of people who commit themselves to employment in this area, we will not achieve the targets. The green jobs delivery group's green jobs plan will bring this to life and bring to the fore the challenge that we have in this space.



HOUSE OF COMMONS

One other quick comment, which is related to that, is that in our college, we have set up a net zero skills centre to try to support people in these types of skills. We are now having to draw back from that, because there is not the demand for people to come through it. We were ahead of the delivery time. I can give you more details about that offline, if you would like.

Q537 Dr Poulter: Following up on that quickly, there is always a tension in any industry between workforce competence, or having competencies to perform tasks, and paper qualifications, if you like. How do you see that?

Robert Nitsch: We focus on competence—that is the primary outcome—but we understand that qualifications are an important indication of that. We accommodate qualifications within apprenticeships. We are working very hard to align the apprenticeship check out event with the achievement of professional qualifications, so that they become integrated and there is a single assessment, rather than multiple assessments.

Of course, we also have qualifications that can allow you to acquire a top-up element, which you might want if you are going to be a registered heat pump installer or whatever. It is a blend of solutions, but I think both are important.

Q538 Dr Poulter: Do you have anything to add to that? Mr Qureshi first, and then Mr Crowther.

Aadil Qureshi: Per the regulations in this country at this point in time, to address what Mark said earlier as well, adding the ability to put a low-carbon solution into your suite of skills is not a precursor to abandoning what you are currently doing. If your existing customer base still has a gas platform, you will need to help them.

Going back to the importance of qualifications, right now you just need a gas safety certificate and the ability to demonstrate various qualifications, like NVQ and so on, which are the existing qualifications. The company that you work for needs to be certified under the MCS and various other renewable energy codes.

We have determined that the idea of a net new workforce is, I feel, a little far-fetched. These are small businesses that are embedded in the community today, serving those communities, heating their homes and keeping them warm. It is just about adding a string to their bow, rather than a net new suite of people who are going to come in because suddenly all these engineers are going to retire or vanish into thin air.

Dr Poulter: That is very helpful; I am going to come back to that in a second, if that is all right. Mr Crowther?

Mark Crowther: We will be led by what the demand is. In terms of gas, we have very rigorous safety levels. Fewer fatalities per year involve the gas industry than are caused by being struck by lightning. It is about two fatalities per year—that is the pipe gas industry. In a sense, we have solved that one.



HOUSE OF COMMONS

These people may not quite have the skills to do some of the design aspects of heat pumps. Certainly, the off-the-shelf qualifications that you can do in some colleges for a heat pump will not give you those additional design skills, because of these difficult balances: do I have a buffer tank? How big is the domestic water tank? Do I fit TRVs? All that requires the installer to make judgments about which the householder can come back and will complain if they want to—hence the anecdotal issues about poor installations and things.

The answers there are very difficult, because that will cost the consumer additional money. If they will not pay and you do not get the optimum solution, do you walk away, or does the householder say, “It’s all right; I understand”, except that they do not, when push comes to shove. All that is just difficult.

Q539 Dr Poulter: Picking up on something that you mentioned a moment ago, Mr Qureshi, we are expecting a net zero and nature workforce plan this year. I will come to the other two witnesses in a moment, but could you identify what your one priority would be for that? I imagine from your previous answer that you are slightly sceptical of such a plan.

Aadil Qureshi: Across the various industries that need to decarbonise, there is a huge amount that needs to be done. There is an absolute recognition of the skills gap. Let me put that first. The subtlety is if one tries to optimise for the speed with which we are going to get those skills into a workforce embedded on the ground, inside the communities that need to adopt the outcomes of those skills, when it comes to residential decarbonisation it is our strong belief that a large proportion of the pull factor, both to advise homeowners and to then support those homeowners on their decarbonisation journey through a variety of technologies—most likely to be heat pumps in our opinion—will come from the existing industry. While it is 130,000 today, various predictions say we need about 60,000 to achieve the Committee on Climate Change targets for the adoption rates that we need to hit to get to net zero.

But the idea of that entire workforce being completely turned over and not being the same small businesses perhaps handed down to the apprentices that Robert and his colleagues are producing today seems incredible to us. It is not reflective of any other technology transition that any society has ever gone through.

It always comes from within the existing capability and a movement of that existing workforce to the new way, which, in our demonstrated opinion and capability, can be delivered with a light touch, scalable, digital-first approach for existing engineers who already know how to connect pipes, drill through walls and make the home clean and tidy after they have done their physical work.

Robert Nitsch: I think that it is fundamentally systemic in its approach, both in its recommendations and also the response that it elicits. I would say as a footnote that we recognise what technical education can offer to take this forward. The technical education offer is not just in the tools



HOUSE OF COMMONS

department. It can be in lots of other places such as training the individuals who are needed to make retrofit work, such as the retrofit co-ordinator standard that we are about to publish.

Mark Crowther: I agree with much of what Aadil has said. My only issue is that if you train it, unless you use it, you lose it. If you are not doing enough installations, particularly as a lot of this is elements of judgment, you are not practising. We need to up the number of heat pumps from the 60,000 a year, or 63,000 or whatever it is. Across 130,000 installs, that will be only half a heat pump per year. You are not going to learn much from only doing half a heat pump installation. In fact, if you get it wrong, that is another reason for saying, "I'm not going to install another one of those. That cost me a lot of money." Already that is the mindset of a large number of gas installers who have tried to install heat pumps and not done well.

Q540 **Dr Poulter:** My last question is about high-level policy around the workforce and issues to do with that. If you wanted better co-ordinating workforce skills development and planning at a more local level, how do you think that might be achieved?

Aadil Qureshi: We already operate on a community basis. We have folks in our industry and network who have done tens and tens and tens of heat pump installs. They are the most experienced. We enable and empower them to be community leaders, connecting to other folks who, as a result of this demand and supply kind of mismatch, they are not competing with and as a result can coach and mentor.

We believe deeply in the idea of peer to peer being a vehicle for that skill sharing and knowledge sharing, and also all of the business aspects that Mark has touched on a few times. If you speak to somebody who has done 30 successful heat pump installs, you will understand and learn from that experience.

At a local level, how that is co-ordinated is a point of ideation, but certainly it is about empowering those who are succeeding in this way to connect with those who are interested, and then you get a momentum building and a kind of viral effect of those who are successful helping those who are coming into the market next.

Chair: I'm sorry, but time is pressing.

Robert Nitsch: National and local are really important. We need to work together, and we are certainly working with metro Mayors to try to stimulate in their areas.

Chair: Next, to Alexander Stafford. If we are efficient and skilled with time, I can get Barry Gardiner in at the end.

Q541 **Alexander Stafford:** I will be very efficient. Thank you, Chair, and thank you all for your contributions.

Looking at the Government's role and that of standards bodies, are the



HOUSE OF COMMONS

standards bodies working in a correct and efficient way when it comes to these new installations? Robert, how do you feel about that?

Robert Nitsch: We are very grateful for some of the support from standards bodies that we have had to help us to develop the standards. They have contributed. I think the challenge that we would always feel with that is that they are prepared to entertain new ways of thinking and adapt and evolve, and that previous considerations do not become a constraint on innovation but that they are prepared to look at it. Sometimes that can be difficult when funding is linked to that for their own organisations.

Q542 **Alexander Stafford:** Are the standards bodies willing to look at new ways of working and efficiency or are they sort of collapsing in a morass of bureaucracy for this new technology?

Robert Nitsch: It varies, to be completely frank, but we have had some great help. Stimulating that freedom of thought is really important—not overcooking the training of people who fit electric vehicle charging points, for example.

Q543 **Alexander Stafford:** Obviously, what we want to do is to unlock the technology, and get more people to install the technology, and get the consumers. But there is also that risk—we have to make sure that consumers are protected. How have the standards bodies and the Government dealt with that fine balance?

Aadil Qureshi: A really important interplay that has not been mentioned thus far is that compliance-based training in order to unlock the ability to participate in what is a subsidised market is generally speaking not a good plan. That is what we have experienced thus far.

I think those standards bodies that Rob mentioned are definitely listening. We have experienced folks in our network going on the mandatory training required in order to be MCS-compliant, as an example, and leaving the training saying, “I learnt nothing and, in fact, I was taught the wrong stuff.” That is the worst horror story. That is not to say that that can’t be changed and fixed, and those folks are really looking into this.

I will come back again to my point: really embracing the new means focusing on alternative delivery methods, and on outcomes of installs and of the training as a measure.

Q544 **Alexander Stafford:** To pick up on that, you are saying some of the standards bodies are more focused on someone having a piece of paper saying, “You are fine”, rather than the skills and competencies. Is that across all the standards bodies, or just a few?

Aadil Qureshi: I would not make sweeping statements, but I think that is the constant risk. Capability and competence are the most important things—we want to protect taxpayers’ money going into the system—not compliance and box-ticking. Having a QMS system in place in your business proves nothing about the quality and standard of your heat pump install, as a simple example.

Q545 **Alexander Stafford:** Robert, do you want to focus on that tension of box-ticking versus skills and competencies?

Robert Nitsch: We are really interested in competence. That is what we judge things by. We are resistant to embodying qualifications that create monopolies or that do not allow broad delivery.

Mark Crowther: I can't really add very much. IGEM, which is the standard-setting body in the gas industry, has no problem with hydrogen. It all works very smoothly. It is not an issue.

Q546 **Alexander Stafford:** On the piece about after installation, does the Government, the standard bodies and your sectors give the consumer the skills and education to maintain the kit that is installed? With new technology, people want it to work. It will go wrong, and there will be problems, even with basic maintenance. Do your engineers and the way you work as a body allow consumers to have those skills, or is that piece missing?

Aadil Qureshi: Unlike my former industry, the heating industry is not one where consumers are excited by the idea of tweaking their system or keeping the warranty up to date through servicing. I think it is beholden on the commercial sector, particularly the manufacturers, the installers and then the related parties, to make it "set and forget". Homeowners should not have to worry about how they interact or interface with these things, particularly on any technical level. This thing needs to fade into the background, keep them warm and keep their home comfortable and they should not have to think about it any further.

Q547 **Alexander Stafford:** But in the nicest possible way, you would say that, wouldn't you? You want the engineers to come out and fix it when it goes wrong. I am looking more at the consumer in the home who can do the little fixes themselves.

Aadil Qureshi: Servicing and callbacks as a business model is a poor one. That should not be the core focus and frankly, we do not make any money on that transaction, so that is not the reason for saying it. The reason for saying it is that consumer adoption, moving now away from the supply side of the market to the demand side, is based on beautiful, intuitive and simple experiences. It is not based on the early geeks—even saying that as the CEO of Heat Geek—who are deeply engaged with their heating system. Although we love those early adopters, if we want mass scale, my mum, frankly, does not want to be playing with the heating system after it is installed to keep it running.

Robert Nitsch: It is really important—this is what I mean by a systemic approach—that we also build the customer support and system management muscle mass to make sure that these technologies are supported. I am not saying that we have the solution to everything, but this is why we are really focused on things such as the community energy specialist, which is a standard that we are about to release, and the junior energy manager. It is about trying to make sure that we have this slightly more cerebral element of it, supporting the practical delivery.



HOUSE OF COMMONS

Q548 Alexander Stafford: Mark, touching on Mr Qureshi's point, I would like your opinion. Although we do not necessarily want the consumer to be able, or they do not want to be able, to fix and they want to just forgive and forget, is a lot of this down to consumer confidence? If the consumer is worried that there is a bit of tech that might go wrong, even though it will probably not go wrong, if they think they have at least some basic knowledge and skills to be able to tweak it, they are more likely to adopt the technology. Is that what you think, Mark?

Mark Crowther: Not particularly. They will install it because they have a certain faith in it, but they are not going to install it or not install it. More concerning is if you are on a prepayment meter and things, and then you really do learn about your heating system. That is not a happy message, and it adds quite a lot of complication. You will understand, if your card does not last very long, you will want to make sure as to which part of the house you want to heat. We have to be careful that we do not begin to live in a bubble here, which is completely dissociated from people who are self-disconnecting and things.

Chair: Barry Gardiner, you have been very patient and I have a couple of minutes at the end for you.

Q549 Barry Gardiner: Mr Crowther, from what you have said, I guess that if there were three hats in the room, one of which was labelled "the visionary", one of which was labelled "the technocrat" and one of which was labelled "the pragmatist", you would probably pick up the pragmatist hat. You have tried to take us into the mind of a gas installer thinking about the transition to installing heat pumps. In an avuncular, perhaps slightly curmudgeonly way, you have pooh-poohed the idea that this might be something that they can do while maintaining their livelihood at the level that they want to. You said that we need to make it simpler, but you have not told us how. This Committee is about solutions; it is about putting a report to Government that will make recommendations. There is no point in you telling us, "Oh, it is all very difficult." Please, tell us how we make it simpler.

Mark Crowther: We repeat what we did in '67 to '77, with 13 million homes and 40 million appliances over 10 years, organised by the GDOs. Government fund the big pipes, just like they built the Elizabeth line. People come, they have faith. You build the pipes, the molecules come, people have faith—job done.

Chair: Are you happy with that, Mr Gardiner?

Barry Gardiner: No, I'm not.

Chair: I didn't think you would be, and I am happy to indulge you further.

Q550 Barry Gardiner: What you have given me is not, with respect, a pragmatic solution. If I am trying to get your gas installers to retrain as heat pump installers, how am I going to make their lives simpler to do it? Do I say to them, "Okay, look, Government will pay you one day a week of your wages to do that retraining?"



HOUSE OF COMMONS

Mark Crowther: No, because it is very complicated. Obviously, Heat Geek has good people. It has 2,000 people who are real enthusiasts and they want to do it—fantastic. The average gas engineer is not—

Q551 **Chair:** Would you want your engineers to do what Mr Gardiner is suggesting?

Mark Crowther: It is going to be really hard for some of them.

Q552 **Chair:** Hard or not, would you want them to be doing this?

Mark Crowther: I would not, but that is Mark Crowther's prejudice. I would rather go down the hydrogen route.

Barry Gardiner: That was your Elizabeth line point—exactly.

Mark Crowther: It has been shown to—the Isle of Man did it from 2009 to 2012. It quite recently went from town gas to natural gas.

Q553 **Barry Gardiner:** Going to hydrogen is a different proposition, but let's not go down that particular rabbit hole. We are trying to provide a solution to this problem. You have said, "You need to make it simpler for your gas installer to make the transition." What would make it simpler?

Mark Crowther: It would have to be the provision of more guidance on the design of the system, which is what Aadil has been trying to do to help them, such as when the householder says, "Do I need a buffer tank going to TRVs?". It will generally be—technically, I will not say computer programs because there are already lots of heat pump design programmes—about somehow giving the engineer that knowledge and confidence to be able to perform the quite difficult installation.

It is sort of like comparing fitting a gas boiler to going to the moon; for a gas engineer, aeronautical engineering is quite difficult. They are good guys and they are wonderful at what they do, but it almost requires, in many instances, quite a different level of skill. Whether or not mama and papa companies necessarily have that level of skill is another challenge again. That is really hard.

Aadil Qureshi: I will make this super brief. I come from a white-collar background, I am university educated and I worked in tech for 20 years before I chose this mission. I tried to get a heat pump, and it was a nightmare. It needs fixing, and there are lots of things broken.

My co-founder, Adam, is a heating engineer from birth, basically—he came out with a press gun in his hand. He has shown me that we label, generalise and underestimate this engineering community at our peril. I would be happy to make introductions, but I encourage Members to speak with the engineers and to learn how they come into this industry, and why that 2,000 that I mentioned is only in the last couple of years.

We have big plans, and it is not just us—other colleagues, such as Octopus, Aira and others, are working on exactly the same challenge. Those engineers are enthusiastic and highly technically capable. With a

little bit of support from some digital tech, flexible learning programmes and a focus on the small to medium businesses, they can have two roles in the heart of the communities. One is to complete installations, and the other is to help homeowners to navigate what is a fairly challenging decision. Fundamentally, it is about the engineers. They are the answer to this.

Chair: We have overrun, but it was interesting. Thank you all—Mark Crowther, Robert Nitsch and Aadil Qureshi—for coming in. We will switch over to the next panel as soon as we can.

Examination of witnesses

Witnesses: Dr Ciaran Byrne, Jenny Curtis, Adrian Joyce and Kieran Sinclair.

Q554 **Chair:** I ask the second panel to introduce themselves—name, rank, serial number and the county you are from in Ireland.

Dr Ciaran Byrne: My name is Ciaran Byrne. I work for the Sustainable Energy Authority of Ireland, which is the energy agency in Ireland, and I am the director of national retrofit. My role is to oversee the national residential retrofit programme, so it leans into all parts of the sector, and to ensure that we achieve our targets. County Dublin.

Q555 **Chair:** County Limerick?

Dr Ciaran Byrne: Dublin.

Chair: Good at football, but not at hurling.

Dr Ciaran Byrne: And rugby!

Chair: Oh, I forgot about that one.

Jenny Curtis: Good morning. I am Jenny Curtis, the managing director for Vattenfall Heat in the UK. Vattenfall is an energy utility company owned by the Swedish Government. We operate and develop heat networks in the UK, but also established networks in the Netherlands, Germany and Sweden.

Adrian Joyce: I am Adrian Joyce, secretary general of EuroACE Energy Efficient Buildings and campaign director of Renovate Europe. I am an architect by training—I think that's pertinent—and a professor of architecture at a Belgian university on a part-time basis. I was born in Dublin, and my family home is in Wicklow, in the mountains—at least, what we call mountains.

Q556 **Chair:** The Wicklow mountains! We are at least 50% Irish so far. Kieran Sinclair must be Scottish by background.

Kieran Sinclair: Yes, born in Glasgow. I am Kieran Sinclair, a principal energy policy adviser at the Danish embassy here in London. I work on the energy governance partnership, which is a Danish programme of



HOUSE OF COMMONS

intergovernmental co-operation. It varies from country to country, but in the UK it is mostly focused on heat decarbonisation as the area on which we have most to share.

Q557 Chair: We have an international focus on this second panel. Which countries should the UK look to emulate for its home heating transition, do you think?

Jenny Curtis: I think the Nordics really go to show how district heating can be widely rolled out and accepted, and how to support consumers and customers in accessing low-carbon heat.

Q558 Chair: Can district heating happen in the UK? Some members of the Committee have been to Denmark in the last week—not all of us, unfortunately, as parliamentary business got in the way. Can it be rolled out here?

Jenny Curtis: Absolutely. I think there is actually a real opportunity for the UK to become a market leader in district heating. The Government policy is very much moving in the right direction with the introduction of the zoning framework through the Energy Bill, which will provide the demand assurance that investors need to roll out district heating in urban areas.

It is very much about having the right technology in the right place. It won't work everywhere, but there is a real opportunity, using the experience of those international examples, to do it in the UK at pace and speed, and to take advantage of technological innovation, in particular, with the UK's ability to include smart meters from the get-go in the roll-out of networks and to access sources of waste heat, which means that we can provide low-cost, low-carbon heat here.

Q559 Chair: In some places, as you know, domestic heat pumps are an issue. I'm told there are certain councils in England that have declared a climate emergency, but will not or cannot give out a heat pump if its external volume is more than 0.6 cubic metres. That seems to be changing. Have you come across similar restrictions in other countries?

Jenny Curtis: Sorry, in terms of the ability to put heat pumps in—

Chair: If the heat pump's external volume is more than 0.6 cubic metres, it needs planning; it then becomes a whole problem and is frequently refused. Have you come across similar issues in any other European country, where a non-technological issue—a bureaucratic issue, if you like—is getting in the way?

Jenny Curtis: In the countries that we operate in, there is a very supportive planning policy for district heating. Planning is absolutely critical both in the UK and abroad. As I say, it is a case of right technology, right place, so it does depend on the fabric of the urban infrastructure and the particular buildings.

Q560 Chair: Adrian Joyce, are countries more successful generally when they are guided by a single national plan for decarbonising homes, or when



HOUSE OF COMMONS

adopting a mosaic of approaches supported by a more flexible national funding programme? I am looking at France, which has 12 times the heat pump output of the UK, but it has a central one-stop shop. In the UK, it seems like there is just a killer of choice, and potential domestic arguments over what type of pump we are going for and what make, or choice we are going to have. Do you have any thoughts on that?

Adrian Joyce: You have mentioned a few key points there— national building renovation plans, decarbonisation plans, one-stop shops. Bringing information, help and advice to homeowners is a really crucial tool in the transition to decarbonised heating for homes.

But from my seat, what I wanted to bring to the Committee is the message that looking at the demand side is really important—not just the supply or technology side. There is a great deal of good work that can be done by reducing the amount of energy needed to heat our homes. It cannot be reduced to a question of the technology or the energy carrier. I would like to help you recall why we need to heat our homes; it is because we live and we work in them. You have to think about the person and the interaction between the people and the environment in which they are living and working.

If a building is to be really comfortable it has to have good insulation, so that there are no cold surfaces radiating coolth. It has to have good technology, and that technology has to be well controlled—and digitalisation is also a key element moving forward.

I wanted to give an old warning to the Committee as well—

Chair: We like warnings, so thank you.

Adrian Joyce: When I was an architecture student, we used to talk about “Insulate tight, ventilate right”. Ventilation is often overlooked in the regulations across Europe, and indeed in the UK. You cannot take a building that has been open to draughts, seal it up, and expect no problems later, because we each emit a huge amount of water vapour every day from drying clothes, washing and so on.

The message is that multiple measures must always be rolled out together. Therefore, schemes that incentivise one element over another, be it a passive element like insulation or new windows, or an active element like a heat pump or other control systems, is not usually going to work out. It is this integrated or holistic approach that is very important.

The technologies and products exist on the market today for all countries in Europe—including the UK—to get at least a 50%, and often a 60% or 70%, reduction in the number of kilowatt hours you need. That makes it much easier for the energy system, whether it is electricity or a heat circuit, to deliver the heat to the buildings in the future. I would urge the Committee to think about what you can do on the demand side to make it easier in the future, and we talked about simplification earlier.

Q561 **Chair:** Ciaran and Kieran, I will give you a minute each. Any thoughts on



HOUSE OF COMMONS

this?

Dr Ciaran Byrne: Having not met the other panel members before, I am in violent agreement with them. One of the things they just alluded to—

Chair: I like the idea of violent agreement.

Dr Ciaran Byrne: Yes, it is great on a Wednesday morning.

As I was saying, it is this idea of fabric first. We advocate fabric first and we lean into the European directives. The energy efficiency directive nominally says, “Whatever you’re using, use less of it”, and then we supplement that with renewables—which would be heat pumps and decarbonisation.

In our policies and our schemes, we certainly lean into the fabric first approach and support the development of heat pumps.

On the point Jenny was making, in Ireland we are rolling out district heating. We are nowhere near the level of penetration of the Nordic countries—in Denmark and places like that—but we see a role for district heating in urban areas to get that efficiency level up in terms of how we heat homes going forward.

Kieran Sinclair: Denmark’s heat decarbonisation journey is primarily around district heating. It makes up 70% of heat and is looking to go up to 80%, so that is basically all urban areas. It has been supported by—

Q562 **Chair:** What about the other 20% in Denmark?

Kieran Sinclair: At the moment, the other 20% is a mix of gas and heat pumps and occasional biomass boilers. They will mostly be moving towards heat pumps individually.

Q563 **Chair:** Is there any oil central heating in rural areas—kerosene central heating?

Kieran Sinclair: There is a bit. I think it is broadly similar to the UK, with the exception that the building fabric in rural areas is significantly better, so it is easier to move to heat pumps.

Q564 **Mark Garnier:** Could I start with you, Kieran? You and I spent a couple of days last week when two of us here in this room—and two more—visited Copenhagen in Denmark and had a look at the district cool pump networks. You are a citizen of the United Kingdom who also works for the Danish embassy. One thing that I came away with was the extraordinary progress that Denmark is making in terms of decarbonisation and the economic growth that goes with that. The organisation State of Green seems to be there to promote it.

I came back slightly thinking that we are in the stone age compared with Denmark, and that in fact many other countries are. Kieran, as UK citizen and an adviser to Denmark, what do you think?

Chair: Stone age, or not?



Kieran Sinclair: We are not necessarily in the stone age, but I certainly think that if we look at the Danish pathway there is a lot that we can follow there. The key thing that really pushed Denmark down this route was the oil crisis, which led to the need to have a dispersed and diversified generation of electricity. The heat from that can then be used through combined heat and power to also heat buildings, so you can double-dip on generation.

After that happened, because the combined heat and power plants were able to generate revenue, they were able to help pay for all the pipework you saw when you were there. After that has been built, you can then change the energy centres, which is one of the great things about heat networks.

The pipework and the interface with the building stays the same, but you can change the energy centres from gas to, potentially, heat pumps, biomass or energy from waste. The revenue from that CHP let us pay for the pipes, and we are now decarbonising. Therefore, heat is about 70% from renewables at the moment.

Q565 **Mark Garnier:** It was interesting to sit in a tunnel underneath Copenhagen where they are providing heat for houses—I think it was in the hundreds of thousands of houses. I did a very basic calculation on the cost of that tunnel. If you had spent that money on the subsidy that goes into heat pumps in the UK, that would have provided heat for 16,000 homes, whereas this was providing heat for, I think, 160,000 or 200,000 homes. The Government are obviously putting in £7,500 pounds of subsidy per heat pump. Given that many parts of London or other cities have quite closely knit communities, would that money not be far better spent on investing in the infrastructure in the way that you are doing with those district heat networks?

Jenny Curtis: Absolutely. There are places where heat pumps are the right solution, but those are not in the dense urban areas. In cities, it is likely that district heating will be the lowest cost, lowest carbon solution. That is what local authorities, working with DESNZ, are doing through the feasibility studies to implement zoning in the UK, which we think is absolutely right.

Q566 **Mark Garnier:** And they are being responsive? You are finding that the Government are awake to this?

Jenny Curtis: We are. It is a complicated piece of policy. What we need is better clarity on the demand assurance that they will provide for investors because heat networks are long-term and complex pieces of infrastructure that require material upfront investment. Government policy is to move from having 2% of the UK on district heat networks to 20% by 2050, and that would require £60 billion to £80 billion of investment. There are investors that are ready, such as ourselves and other institutional investors, to make that investment.

In the Nordics, district heating is a very popular asset class for investors, but what you need is the certainty of demand. That comes from both new



HOUSE OF COMMONS

build, where we are in a good place in terms of mandating connections for new buildings—we have that already; Vattenfall is working in Bristol in partnership with Bristol City Leap—and, crucially, retrofit. The retrofit market is much more challenging because we need to be able to provide a positive economic rationale to those existing building owners to switch from a gas boiler to a district heating connection.

Q567 Mark Garnier: Is it not just a lot simpler, though? Presumably you are just putting a heat exchanger in; you pipe in hot water that goes through a heat exchanger and out comes cold water. If you take the average leafy Clapham terrace of houses, is it not just a lot easier to do that than it is to muck around with heat pumps?

Jenny Curtis: It is, although we do have to make buildings heat network-ready. It is important that district heating is positioned alongside fabric first-type interventions in terms of the building fabric to allow us to provide lower temperature heat, which is really what we need to do to be most efficient and to be able to access the sources of waste heat—the heat that is already here in our environment—from things such as data centres, mine water and sewage waste heat. That is ultimately where you get the carbon savings.

Q568 Mark Garnier: Ciaran, can you share with us any examples of where Government support schemes in other countries have successfully encouraged the uptake of low carbon heating and energy efficiency measures?

Dr Ciaran Byrne: I suppose the closest one to home would be our own, and we have a significant grant program for the roll-out of heat pumps. We are on the early adoption phase of that curve. We would also look to Europe, some of the Danish countries and Holland, which has a very extensive heat pump programme and hybrid heat pump programme.

As Jenny said, it is anticipated that, in the Irish context, it is going to blend in with a developing district heating network because you are looking at where we can use heat pumps, where we should use heat pumps and where we should use district heating. We are doing a fairly significant amount of roll-out in relation to heat pumps at this present point in time.

Q569 Mark Garnier: I have one last question for Jenny. Obviously, you come from a Nordic background. One thing I was very impressed with in Denmark was the organisation State of Green, which is there to promote and educate. Do other Nordic countries have that? If you were to bring something like that here to the UK, how do you think that would be run?

Jenny Curtis: District heating is so much more a part of the fabric of these countries, so it is taken as a given. Here, we have a massive educational challenge because nobody has ever heard of district heating. When I try to explain to people what I do, I end up saying I work in renewables, which is not really even true. We need to get the narrative right and to provide these clear technology pathways to explain the options that there are and their advantages to the general public.



HOUSE OF COMMONS

Q570 **Mark Garnier:** That is what an organisation like State of Green would do if you had something like that here.

Jenny Curtis: I am not familiar with it.

Q571 **Mark Garnier:** What do you think? Should we have something like this in the UK?

Kieran Sinclair: Yes, we should. I think the Government are receptive to that idea; we just have not quite got there yet. We also have the Danish Energy Agency, which provides technical expertise. There is a website/marketing programme called SparEnergi—it basically means “energy savings”—which provides consumer information on heat pumps, energy efficiency and heat networks, and how they all fit together and what choices the consumer has to make. All of that put together means that the average Danish consumer is very happy to be on a heat network. During the gas price crisis, when gas prices were very high, people were knocking down the doors of heat network developers to get connections, which is obviously a great place to be.

Q572 **Mark Garnier:** Do you want to add anything to that, Adrian?

Adrian Joyce: I am not an expert on district heating, but I am a fan of it when it is a suitable technology. I would not mind touching on the question I think the Chair asked about whether the UK is in the stone age.

Mark Garnier: That was me, actually.

Adrian Joyce: Oh that was you. Well, the answer is definitely not—but there are moments when curious decisions are made. From abroad, it looks as if some of those decisions are party politically driven. That is another warning I wanted to give. The topic we talk about, efficient buildings, should not be a party-political issue.

Q573 **Chair:** Are you saying that you are observing culture wars with types of domestic heating?

Mark Garnier: Culture wars between different sides of the aisle.

Adrian Joyce: Yes, using green transition as a political football.

Chair: We have seen that too.

Adrian Joyce: It is a cross-party Committee, so I think I can fairly say that. It is a good thing to be talking together across parties. What we are asking for is good across the political spectrum for the environment, society and the economy. I represent industry. Our industries are asking for more and more ambition in the political framework to support a long-term, stable, clear demand for energy-efficient technologies moving forward, and to bring down the demand, as I said in my first words, so that it is easier to supply that demand with renewables.

Mark Garnier: On that very specific point, there have been massive arguments going on—obviously, we have a general election coming up, which I suspect will be quite ugly—about £28 billion U-turns and who is



HOUSE OF COMMONS

doing what and all this kind of stuff. This is creating uncertainty. We had some energy suppliers in the other day, and they are under a lot of the attack because they are making super profits. One of the interesting things was that the political narrative here means that their credit rating is lower here than it would be elsewhere. It means the cost of capital is that much higher. I think the Chairman wants me to hand over.

Chair: Excellent, thank you very much. I did not quite grasp that district heating is a real possibility in the UK and cheaper on aggregate than heat pumps—although I am sure heat pumps have been used with district heating as well. I will bring in Barry Gardiner—you have been patient, thank you.

Q574 **Barry Gardiner:** Ms Curtis, I think I heard you say the UK can become a real leader in domestic heating. I wanted to ask you about low-carbon heat technologies like heat pumps, where I think we have 1% roll-out in the UK, compared with 60% in Norway, and 40% in Sweden and Finland. My God, if we are going to be a real leader, what would you say if you were in front of the committee in Sweden or Norway?

Jenny Curtis: My position was that we have the opportunity to become a market leader in district heating specifically, which is always going to be part of a mixed economy for heat.

Q575 **Barry Gardiner:** With our planning regulations, you believe that?

Jenny Curtis: If we implement the new zoning legislation, which is currently under consultation, in the right way there is a huge opportunity here for us to do technologically advanced networks in a way that is the envy of some other territories. We will be able to do them low carbon from the get-go, rather than having to retrofit. In Sweden and the Netherlands, a lot of the existing heat is provided by gas and biomass, whereas here we will be able to do it using energy from waste and other third-party sources of heat.

Q576 **Barry Gardiner:** Thank you for clarifying that point in my mind. What has made heat pumps such a success in other countries, whereas for us the “balanced pathway” that the Climate Change Committee set last year was for something like 130,000 heat pumps a year, and we have actually achieved 69,000?

Jenny Curtis: Within our business, we are using large-scale heat pumps to provide communal heating to groups of buildings. Those large-scale heat pumps are a fundamental part of our technological solution. In terms of domestic-scale heat pumps, which I think are what you are asking about, there are obviously huge challenges here in terms of the supply chain, skills, affordability and understanding of that technology.

Barry Gardiner: Any other takers for this one?

Dr Ciaran Byrne: We are looking similarly at the Nordic countries. We have also visited Denmark and come back feeling a bit forlorn. However, this is not a new thing—



HOUSE OF COMMONS

Chair: There is a Danish plot to make everybody feel like that.

Dr Ciaran Byrne: Exactly. But it is a multi-decade project. I was listening to the earlier panel talking about transitioning from an existing supply chain, skills and all that to a newer one. Fundamentally, what is working for us is real certainty in terms of policy direction. I am not being facetious, but at the high level, all across the political divide and spectrum, people are saying, "This is the direction of travel. This is what we are doing." We have significant funding behind us, so between now and 2030, which is not that far away, we have €8 billion to spend on retrofitting.

In our business, there are four boxes, as I see it. One box is creating that demand among homeowners. The second is providing the skills. The third box is providing the funding, and the last is the governance framework in terms of planning and all the rest of it. We are bringing all those boxes up at the same time to create that demand.

Q577 **Barry Gardiner:** I totally get what you are saying about clarity and certainty of policy purpose. In Ireland, you have also seen some success with hybrid schemes between gas boilers and heat pumps in domestic installations, haven't you?

Dr Ciaran Byrne: We are only starting to roll those out. One of our agents is currently piloting the use of hybrid heat pumps because, again, what we are trying to do is build up a more extensive menu for decarbonised heating. At the moment, it is kind of a "heat pump or bust" situation, so we have to look in areas—as Jenny pointed out—where district heating will be the choice, the preference. In other areas, it will be pure heat pumps and, in other areas, it will probably be hybrid heat pumps with things like that.

Q578 **Chair:** What is the efficiency of the hybrid heat pump?

Dr Ciaran Byrne: I don't have the figures to hand, but I think it very much depends on the way it is installed and the balance between them.

Barry Gardiner: I think it is in the briefing, actually.

Kieran Sinclair: The pathway that let Denmark get to the stage that it is and to decarbonise as effectively as it has was a combination of district heating—

Barry Gardiner: You mean apart from stealing our wind technologies so successfully.

Kieran Sinclair: Exactly. It was a combination of district heating and the mandated connection, but specifically allowing gas and biomass CHP. The Government have moved very quickly in terms of regulating the sector from a few years ago when it was not regulated, as well as introducing zoning powers with mandated connection, which is very similar to where Denmark was. The difference is they are trying to go straight to heat pumps with quite strict carbon standards. Some companies, such as



HOUSE OF COMMONS

Vattenfall, are doing great work there, but you could make the systems significantly cheaper if you allowed gas CHP as well as heat pumps.

Q579 **Barry Gardiner:** Very briefly on your biomass district heating system, what is the pollutant effect of that in the atmosphere? What are the emissions from it, and what is the impact of not ploughing it back into the soil for the loss of organic content in the soil? If you are actually trying to do this for the environment, it is not all about the low-emission domestic heating supply.

Kieran Sinclair: The biomass varies—

Q580 **Barry Gardiner:** But you use a lot of straw biomass, don't you?

Kieran Sinclair: Exactly. There is straw, and there are wood chips and pellets. The important thing for the UK is we are not suggesting that the UK would follow down the biomass CHP route. Frankly, there is not enough biomass or waste to do that, but gas CHP can still offer a lot of the same benefits. The idea is it is not fully decarbonised if you have some gas CHP and some heat pump, but it is better than where we currently are where it is all on gas.

Q581 **Barry Gardiner:** Mr Joyce, can I ask you about the way in which other countries either do or don't allow their consumers a range of choice as to what they do? Obviously, if you're going to introduce a district heating scheme, it is pretty important that everybody is on board. How do you get over that sense of, "It's my house. I'll heat it the way I want to, thank you very much"?

I ask that question because we tried a hydrogen scheme in the UK, with a pilot phase in a village, but it had to be scrapped, because even though people were told that there would be free installation, that they would be put back on gas if they wanted to at the end of the pilot and that there would be free reinstallation with a new boiler—all those blandishments didn't work. People just said, "No, thanks."

Adrian Joyce: To bring to the Committee some experiences from other countries, and I appreciate your question on choice, in Czechia there has been a long-running scheme. I violently agree with Ciaran on this—

Barry Gardiner: I wish we could all have violent agreement in Parliament; that would be nice. *[Laughter.]*

Adrian Joyce: Schemes are really important for industry in predictability and investment decisions. In Czechia, they have been running what they call a new green savings programme for homes since before 2013. The same programme has been running throughout this whole 11-year period with great success, because geographically the spread of homes that have benefited from this scheme is nationwide. That is another thing that I would advise: that when programmes are designed, they should be designed to not be discriminatory of different socioeconomic groups or different geographical regions, but should be available across the entire nation.



HOUSE OF COMMONS

Another good feature in Czechia is that the funding largely comes from carbon revenues, and that is a lot of good sense. You earn some revenue from carbon. You don't put it in the general budget; you put it back to save energy. That is a very good scheme that I think is worth bringing to your attention.

The second thing I wanted to say is that I am surprised that innovation has not been touched on much I wanted to bring to your attention that there is a lot of innovation in the renovation market across the EU, which is an approach called Energiesprong. Some of you may have heard of it. Whole house renovations take place in one to two days, with on-site works, because all the panels are built in a factory in great conditions, attracting young female workers into good working conditions. Innovation is going to be needed to get to the levels of carbon reduction that we need in homes moving forward.

Q582 **Barry Gardiner:** Those panels are what, precisely?

Adrian Joyce: They can be anything the customer wishes them to be. In fact, you can have huge consumer choice in a prefabricated renovation approach and you can integrate the heating, ventilation and electrics in the panels that are built.

Q583 **Barry Gardiner:** Could you send this information to the Committee?

Adrian Joyce: Absolutely.

Q584 **Vicky Ford:** As someone who was born in the north of Ireland and spends a lot of time in the south, I'm loving the Irish accents and having both a Ciaran and a Kieran. And I'm smiling to myself that you mentioned the energy efficiency directive, because I was one of the rapporteurs and we rewrote it in 2012.

What I really want to focus on is what information different countries give to consumers. Part of that work in 2012 was upgrading the energy performance certificates, and we hear that they need another upgrade. What are other countries doing—we'll start with Ireland and then we'll go to Denmark—to give people good information on the energy performance of their homes and to signpost them to trusted advice?

Dr Ciaran Byrne: Thank you very much for the opportunity. What we do in Ireland, and I think it is one of the best ways of getting information across, is that we use sustainable energy communities. We have over 850 sustainable energy communities right across the country, which are basically energy champions in their local community. They are involved in providing advice, understanding the energy use in the community, and then identifying roadways and plans for how to improve that. That's at a community level.

Q585 **Vicky Ford:** Who pays for them?

Dr Ciaran Byrne: We support them, in the sense that we provide them with the grant for the energy masterplan, and we also have a network of mentors across the country, both at the county level and then also



HOUSE OF COMMONS

individual mentors that manage and support the communities. They are community-led with our support and we provide information to them.

As we are an energy agency, we have a very significant role in terms of communicating via the website and various types of media communications the role and honest, independent information in relation to energy and energy use. For example, last year we had a very successful Reduce Your Use campaign as part of the energy crisis, but also as part of our development of one-stop shops. There are a number of one-stop shops across Europe, taking different approaches. One approach is that they are purely advisory. The approach that we have taken in Ireland is that the one-stop shops are effectively companies that will come in and do your whole energy upgrade. However, as part of that process they deliver what we call a home energy assessment, which is a full engineering assessment of the energy performance of your home.

Q586 Vicky Ford: How is that different from getting an energy performance certificate?

Dr Ciaran Byrne: It is significantly more detailed than what we would call a B0, or an energy performance certificate. It entails effectively three parts. One is the base level energy performance certificate. Another piece is a full technical assessment, which is a design for the heat pump. The third part then is the individual journey with the homeowner, because every home is different, even on the same street—somebody has got some work done, somebody has a conservatory and somebody does not. We look at the homeowner preferences and identify for them the different pathways of how they will get to the end point. In our case, it is a B2, which would be very similar to an EPC C—

Q587 Vicky Ford: And that process looks at both the cost of and the carbon used in heating your home.

Dr Ciaran Byrne: Exactly.

Kieran Sinclair: In addition to SparEnergi, the website and the Danish Energy Agency, there is also the Danish housing and building register, which contains a tool that will analyse the performance of your house and email you with suggested improvements. We are currently working with the UK and Scottish Governments on trying to see if that can be brought to the UK. In general, for district heating the biggest thing is that it has been known to work. Most people are on it and people's neighbours are on it. It is a bit like saying, "How would you persuade people to gas—"

Q588 Vicky Ford: That is for district heating. What about if I was looking at retrofitting my individual home?

Kieran Sinclair: In that case it would be mostly the housing register and SparEnergi.

Q589 Vicky Ford: Who signposts the homeowner to trusted advice and support on that individual exercise to decide? If district heating is not available, how do I make my home more energy efficient?



HOUSE OF COMMONS

Kieran Sinclair: SparEnergi has a website. It also does various campaigns. Again, by and large, district heating is the main tool. People who do not do that tend to be more independently minded and go out and do it because they want to do something different.

Q590 **Vicky Ford:** And looking across Europe, Adrian, are there other countries that we could learn from on this in giving individuals their trusted advice?

Adrian Joyce: Absolutely, 100%. I have a paper that I will send to the Committee next week pointing you to several of those. For example, in the Basque region of Spain, there is a one-stop shop approach called Opengela. It means “open room”, and it is a physical place in the locality where the worst-performing buildings are. The local community can come and meet and be informed, discuss and be engaged with the measures before they are put into place, with independent and expert advice knowledgeable of the region.

In Brussels, there is Homegrade, which is another one-stop shop approach that gives more advice than the full service. Hungary has the RenoHub. Greece is rolling out a number of one-stop shops. It is beginning to be a model appreciated for its true value, and I am happy to say that the new revision of the buildings directive, which you must know about, will ask that there is one one-stop shop per 80,000.

Q591 **Vicky Ford:** One of the things this Committee has noticed is that in England especially, there is a large number of properties in conservation areas, often in rural villages where it is every home, by definition. Lots of them are probably quite old and difficult to do. Do you think that those sorts of one-stop shops in your local area could make a big difference in these hard-to-treat areas?

Adrian Joyce: No question about it. A homeowner is not an expert in building physics or building technologies. They need to be able to turn to a reliable, independent source of advice. That is best to be another person, not a digital source, although that appeals to a certain segment of society. For heritage areas, it is possible to make significant improvements to energy performance without impacting negatively on the heritage value. A number of EU-funded projects have demonstrated the approaches that can be taken.

Q592 **Vicky Ford:** In terms of funding those one-stop shops, it sounds similar to the Irish community hero. They tend to be funded from state-funded sources, rather than from the industry.

Adrian Joyce: From my perspective, the best source of funding is mixed or blended funding, which I understand is what is happening in Ireland. There is a certain sum given by the member state and a certain sum brought by the industry through certification or licensing. A lot of the one-stop shops have lists of certified or approved installers—it is a long list—so you can go reliably to those installers, not just rely on the yellow pages. That is also about the trust issue raised in some of the earlier discussions, which is very important.



HOUSE OF COMMONS

Q593 Vicky Ford: I have one last question on the Irish model, which is probably most similar to a lot of the UK. How big geographically is a "local area"?

Dr Ciaran Byrne: We have been very open in our definition in relation to community, so anybody can be a community. We have had universities, we have some of the islands—

Q594 Vicky Ford: But is that community covering a 50-mile radius or a 15-mile one?

Dr Ciaran Byrne: It could be a small town or a small village. We have a SEC in the Irish Financial Services Centre. We have them here, there and everywhere. We took a call earlier on in the process that we want people thinking and working about energy management in place, as opposed to being really prescriptive about what it should be.

One other really important point about the one-stop shops is that from a homeowner's perspective, you are going to a single point of contact, and we have put a huge amount of work into this quality piece. The homeowner doesn't know, generally speaking—they don't really want to know, to be honest—one thing from the other thing, which they should do where and what sequence they should do things in. The one-stop shop takes them through the entire journey and provides the assurance.

As Adrian said, in some cases, one-stop shops are contractors themselves. In some cases, they are effectively project management aggregators. They are bringing panels of contractors. But they will take responsibility. If you have a problem, you are not ringing the plumber or the heat-pump guy or all the rest of it—you are ringing the one-stop shop.

Q595 Dr Poulter: Mr Sinclair, how effectively have other countries delegated responsibilities for the home heating transition process?

Kieran Sinclair: In Denmark, it is a mixture of public and private. The municipalities are very often involved. They tend to have multi-utility companies, of which heating is just a part, but equally the individual developers have marketing and consumer engagement functions within them, some of which would work in the UK. Others are based around delivering Danish pastries to people to convince them to connect to your heat network, which maybe wouldn't translate so well.

Q596 Dr Poulter: Which ones would work well in the UK?

Kieran Sinclair: The local authority route is probably most effective. The UK is heading in that direction anyway; with zoning powers for heat networks, the local authority will be the zoning co-ordinator by default. We are running a mentorship scheme with more than 50 local authorities in the UK and Scotland to try and help support them by showing them best practice from Danish developers. It should be a combination of the private sector, with the developers and the local authorities, who understand the area.

Q597 Dr Poulter: The challenge is, I suppose, that if local authorities were to



HOUSE OF COMMONS

take on that responsibility, in some local authorities there would be quite a lot of variability within that. Some local authorities, as we saw when they took on public health responsibilities, do not understand how to commission properly for public health and that has led to quite a number of challenges.

To make it effective with local authorities, drawing on the examples in Denmark or elsewhere, how would you make sure that we had a system that was fit for purpose? How would you help to iron out some of the potential challenges of variability in practice or the ability of local authorities?

Kieran Sinclair: It has to be properly funded. The Government have said that they will set aside specific funding for designing co-ordinator functions, but it is really key to get the people who actually design and build the heat networks involved as soon as possible, because they are the people who really can tell you what is and isn't feasible.

It is a combination of the private sector expertise and the local authority having proper funding for the zoning co-ordinator role.

Jenny Curtis: I would agree. We see a really important role for local authorities in the UK as placemakers for their local area, understanding the needs of consumers and the built environment. As part of that, a role as zone co-ordinator is appropriate. But it is really important also that there is sufficient funding and expertise.

We are a nascent market in district heating in the UK. There is a very limited pool of expertise currently and local authorities don't have the biggest repository of that, so they do need to be supported by consultants and by appropriate funding from Treasury and with standardisation, centrally, in terms of standardised approaches to procurement and contracting.

In terms of the international examples, our business in the Netherlands has gone down a similar route to the one the UK is looking at for the roll-out of district heating. Municipalities have zoning powers, and they work in partnership with the developers and local authorities to make sure you get the right scale, pace and technical solutions.

Q598 **Dr Poulter:** To get into the granularity, would you have mandated national standards as a mechanism for showing local authorities what good looks like in delivery?

Jenny Curtis: Yes. In the Netherlands, there has been a Government statement that they will come off gas by 2050. That gives the local authorities a standard against which to measure local initiatives. We are also giving the local areas the independence to come up with their own targets. For example, Amsterdam, where we have a network that connects 145,000 customers, is looking to be fossil-free by 2040. It is a combination; the local authority works in partnership with the developers in those areas.



Adrian Joyce: I agree that who gets the delegated power to make decisions in this field varies widely across the EU, from the national level to the regional and in many cases down to the city level. In all those levels, the capacity and knowledge are not usually deep enough or good enough. There is a European answer to this: the technical support instrument. The European Commission, under DG reform, has a fund and each country applies annually. They can get direct funding for capacity building and technical knowledge, right into the governance level that is required.

The second instrument worth mentioning at the European level is administered by the European Investment Bank. It is called the ELENA facility. It gives a grant to a local authority or a community—it can be quite a small entity—but the commitment has to be that, from the knowledge developed with that grant, at least 30 times the value of the grant is invested into real projects on the ground.

Over the life of the ELENA project, the average leverage is 32, so it is higher than the minimum. This approach of giving a helping hand at that critical start is a good one, but it is based on a very clear trajectory. The European Union knows where it is heading, and it is not pushing its target dates out; it is going to stick to them. That gives certainty to the market and the market players. It is any governance level, but any level would need support.

Q599 **Dr Poulter:** I have one very quick follow-up question about rural and off-grid properties. A challenge with a national framework is that it may not consider some of those properties adequately. Can you think of some good examples, perhaps internationally, of effective schemes that have been put in place for rural and off-grid properties?

Adrian Joyce: I admit that we tend not to talk enough about rural properties, certainly at the European level. Across Europe as a whole, about one third of the population lives in rural properties, so the challenge is substantial.

Small district heating schemes are mooted for some villages, but I am not sure that is the right answer. Electrification is certainly the one being looked to as the right answer for rural properties. Again, that should come with improvement to the building and giving the controls through digitalisation to the owner to properly manage that in the operational phase.

Dr Ciaran Byrne: I agree. We recently did what we call a heat study: we looked at the heat demand across the country and identified areas where district heating might be suitable. We found a large number of areas. For rural, one-off houses, we have identified that typically in Ireland they are heated with oil, so to hit those ones would have a significant impact on decarbonisation. The grant schemes we have developed are effectively menu-based. They bring everybody with them; everybody can apply. It is just a flat menu, and that is what you get. We have costed it out to try to



HOUSE OF COMMONS

attract certain types of properties, and that seems to be working reasonably well.

Kieran Sinclair: You can get very small networks that work effectively. There are some with fewer than 3,000 people that have up to six different energy sources; they have wind, solar, thermal storage. But the difficulty is the isolated, rural houses in the UK that don't have good energy efficiency, because whatever you do it will be very expensive.

Chair: A man who is always skilled and efficient with time: Mr Pawsey.

Q600 **Mark Pawsey:** Just a quick one because I know we all want to get to PMQs. I am sure each of our witnesses heard the panel that we just had on workforce and skills. Are there any lessons that the UK can learn from other countries, and it is always important to give these engineers time off the tools and for Government to fund that time?

Dr Ciaran Byrne: I love that phrase; it is one that we use regularly. We are facing the exact same issues, really, in trying to transition people from doing something they have done for 10, 15, 20 years to something new. We provide a range of courses through the vocational training boards, but we structure them in a more accessible way. They are done online or at night time, and they are not all done on site. In fact, some of the training boards have developed mobile rigs to effectively bring the training to the site.

We are also starting to consider providing a stipend in place. At the moment, we have economic full employment in Ireland. We have a very busy economy, and if you are not on the tools, you're actively losing money. I think one of the earlier contributors talked about 95% of the industry being small microenterprises. That is what I call the man with a van. If they are not delivering on the day, they are losing money, so we are looking at maybe providing a stipend to try to attract them into it. But there is a growing demand because what we are doing is stimulating homeowners, so when homeowners ask for it, they will have to provide it.

Jenny Curtis: The supply chain of skills is a key issue. One thing we are trying to do is bring new entrants into the market from abroad, so we are looking at whether we can get all the supply chain partners we are working with in the Netherlands to set up here with inward investment.

Q601 **Mark Pawsey:** In the UK?

Jenny Curtis: Yes.

Adrian Joyce: There is a question about how you can make the sector more attractive for younger people or more women to join, because it is an ageing sector. One way forward is to bring in more robots—or cobots, as they are called—to assist with the heavy work on site to attract younger workers in. They bring a requirement of more skills in the digital and computing area, which is very attractive to young generations. They have to be given a career path that they know they can follow for 20 or 30



HOUSE OF COMMONS

years, and that career path can be defined in national building renovation plans.

Kieran Sinclair: Since we just mentioned bringing women into the sector, there is an organisation called District Heating Divas that does exactly that and is very successful. In general, the supply chain will continue to be an issue. If you give the market clear signals that you want to, for instance, build a lot of district heating, the companies will find ways to make sure that training is there. It is all about clear long-term decisions that they can plan around so they can put that in place.

Q602 **Chair:** Kieran, can I just pick up on something? When our colleagues returned from Denmark, they talked about the big volumes of water that Denmark has to store heat. Amazingly, they told me that those volumes of water lose 5% of their temperature in a year—not in a day or an hour, but a year. What volume of water is that—presumably it is very well insulated—and what temperature is it at?

Kieran Sinclair: That is pit thermal storage. I couldn't give you the volume of water off the top of my head.

Q603 **Chair:** You could write to us and let us know.

Kieran Sinclair: I absolutely will.

Q604 **Chair:** And roughly what temperature is it stored at?

Kieran Sinclair: The temperature is usable for district heating, so 70, 80 or 90°C.

Q605 **Chair:** So it is losing 5% of that 70, 80 or 90°C in one year, which is pretty amazing.

Kieran Sinclair: That is for well-performing ones, but there are some research papers on it.

Chair: On the hybrid pumps, we found out through Google that it is about 2.5 times, so they are equivalent to the air source pumps. Some say they can go up as far as four times.

Mark Garnier: That is also available on the state of energy website.

Chair: It is also available on the state of energy website, where Google goes to. Thank you all. Maybe I should have said to our Irish guest, "Fáilte romhat," when he started, but now I will say, "Go raibh míle maith agat".