

Anisha: Hello and welcome back to a brand-new episode of On The Air. Last year, I was joined by my wonderful guest co-host, Emily Batchford, who works as an environmental sustainability officer at Stonewater, to talk about fuel poverty. And I'm really pleased to welcome her back today to interview our panellists about one of the low-carbon heating projects the team have been working on. Welcome back, Emily. Do you want to do the honours of introducing our guests?

Emily: Thank you, Anisha, and thanks for having me back so soon. We've got a really great panel with us today that are going to be able to not just talk about the breadth of one of our most forward-thinking and innovative partnerships, but also the real life benefits it's had for our customers, too. So sitting down with us today, we have Adam Masters, who I work really closely with at Stonewater, as he is our environmental sustainability manager. Next to him we have Matthew Trehwella, managing director of Kensa Contracting, and also Paul Brennan, who has effectively become our celebrity customer with all the appearances he's done in relation to the project we're going to talk about today, wouldn't you say so, Paul?

Paul: No comment.

[Laughter]

Anisha: Thank you all for joining us today. So just to kickstart, can we just explain what the Energy Superhub Oxford project is? Matthew, would you like to kick us off?

Matthew: Yeah, no problem, thanks for having me on. The Energy Superhub at Oxford is an Innovate UK-funded project that aims to study, demonstrate and understand energy systems in a local area. And it's got three main elements which is balancing the electricity grid, the low carbon transport – so, in this case, electrification – and low-carbon heating. And it's how all of those three things interact with each other. So it has a large battery being installed just south of Oxford on the main grid connection. It has vehicle-charging infrastructure being installed at the park and ride. And the part that we're talking about today is heating, and we've installed ground source heat pumps in 60 properties in Blackbird Leys that are all owned by Stonewater Housing. And we're demonstrating some particularly exciting low-carbon technology alongside those ground source heat pumps.

Anisha: So because it's low carbon, does it mean that it's more expensive or is it harder to control the level of heat in the home?

Matthew: It's more expensive at the moment to install, but once you've got the system installed, it's actually cheaper than most heating systems. It's very competitive with even mains gas, which has for a long time been the cheapest heating system out there, so this competes pretty well with it. In terms of controllability, you can control it in exactly the same way as you would a gas heating system. So it's a full wet central heating system with full control and low running costs. At the moment, I say it costs a little bit more to put in to begin with, but once you've got it, it's in there for a long time and gets good results.

Emily: That's really helpful, thank you. I wanted to ask, Adam, how did Stonewater actually get involved with the Energy Superhub Oxford, and why is it an important project in terms of our sustainability objectives and journey towards net zero?

Adam: In terms of our involvement in the project, Kensa are – or were – already a partner on the Energy Superhub Oxford project, so Kensa came to Stonewater. We've been working with Kensa for a number of years now, installing ground source heat pumps in some of our more rural properties. So Kensa approached us about the opportunity to be involved in this exciting, high-profile project, which we're really interested in. And we had quite a lot of homes within the area, so it just worked well in terms of our planned maintenance programmes. The homes at Blackburn Leys were due for heating replacements, so we were able to work closely together to identify whether those homes would be suitable to take part in the project. In terms of the importance of the project for us, this is the largest scale project we've done with ground source heat pumps to date. So previously, I think we've probably been doing, sort of, 15 to 20 homes on a site at any given time. So to do a scheme of 60 was really important for us to demonstrate how we could start to scale up this project. Also the use of smart energy tariffs, which we're hoping to roll out in future when the energy market calms down a bit.

It's another mechanism for us to demonstrate how we can innovate and make these heating systems even more cost-effective for our customers to run, because we know that decarbonising the heating within our homes is probably the biggest challenge we've got to achieve a net zero for our existing homes. As Matt said, to date, gas has been the cheapest form of heating across the UK, so to be able to demonstrate an alternative form of heating that is low carbon and affordable to run for our customers is really important. And then that feeds into our thought leadership work, where we're lobbying government for more support and funding to roll out technology such as this to help bring the cost down, so that actually, in future, the cost of installing the technology is comparable to traditional heating systems as well, which is where we really need to get to, to scale up.

Anisha: Thank you so much for that, Adam. It'd be really good for us to know where we're at with the projects to date.

Matthew: Sure. So the heating systems are all installed and they've been running for around 12 months now, so at the moment they're running as a pure ground source heating system. So the same as we're installing all across the country in properties like this, the next stage of the project is to turn on what we're calling smart controls. So rather than having a normal clock and a normal sort of dial thermostat in each property, we've got a digital device that's Internet connected, which means we can change how the heat pumps run remotely. And our plan then, as soon as, as Adam said, the energy electricity supply market calms down a little bit, what we'll be doing is running the heat pumps to target times when electricity is plentiful and cheap. So, as most people know, it's very famous, the 'Coronation Street': everyone comes home and turns their kettles on and the electricity grid struggles to cope with it – there are less severe versions of that – and particularly between 4pm and 7pm the grid comes under quite a bit of strain. Lots of high-carbon, high-cost devices – gas turbines start firing up to cope with that demand. So if we can avoid running the heating during that time, we can actually put less strain on the grid, we can access when electricity is cheaper, but also when it's lower carbon. So we kind of get this triple benefit of stabilisation, reducing costs and reducing carbon. And that's what we're planning to do with the smart thermostats. And they're actually going to be doing that live, so each day we're going to get a forecast of the electricity price – and the price is a very good proxy measure for how much strain the grid is under and how high carbon it is – and then every evening we're going to recalculate an optimum profile for the following day. So it will take account of how warm people like to be,

when they like to be warm, how their property performs thermally in terms of insulation and the size and the output from the heat pump. And it takes all of that information, does all the calculations in the cloud, and then sends a new profile down to the thermostat and it just automatically runs in the background. So what we're aiming for is people living in the properties won't really notice, but their heat pump will be turning on and off at different times and it would just be happening in the background, but we'll be saving them money when it comes to the end of the month and the bill comes in, because they'll be running at that cheaper time. So, that's kind of where we are and where we're about to go with the project.

Emily: That's really great. Thank you so much for explaining that. I think... I don't watch Coronation Street, but definitely put my kettle on and the telly on and make my tea at that time of day. Paul, you actually live at Blackbird Leys – the scheme where this project is being delivered. I'm curious to know what your initial thoughts were when you found out that your home would be taking part in the pilot.

Paul: Because I've never heard of it or anything about it before, I didn't have any preconceived ideas, so it was kind of easy in that sense. The landlord, Stonewater, said 'this is what we're planning', and I think I just accepted it as being 'okay, this is what's going to happen, hopefully it will save a few quid, we'll wait and see'.

Emily: Yeah. Did you have any concerns about the disruption or even how the system would work?

Paul: No. Quite simply, no. From the first notification to when work actually started, everything was pretty much covered. If I had any questions, I knew where I could go to get an answer, and that was... it was just a matter of waiting for the whole process to run its course and then get started on using the system itself.

Emily: Yeah, fantastic. So good support for you from the early, sort of, stages of the project meant that there were no concerns. That's great to hear.

Paul: Everybody knows there'll be a bit of noise involved with it, but most things that are worth doing of that sort of nature are going to cause some sort of disruption. You've just got to kind of... I don't want to say grin and bear it, but accept it and wait for it to finish.

Anisha: I'm really glad that your experience was, you know, was one where you felt really well informed and you knew, sort of, where to go if you had any questions. And I think, as Emily mentioned in the introduction, you've been somewhat of a star in terms of talking about your experience publicly, Paul. For our podcast listeners, are you able just to share your thoughts on the project now and the benefits of low-carbon heating in your home for the wider community?

Paul: I definitely recommend it from the money-saving point of view. Right from day one, when the system became operational, I made note of what the electricity meter was reading and followed that through the week. I'm a bit of a... bit of a nerd, perhaps, or whatever you might want to call it, but I set up my own spreadsheet that I could record dates and times and amounts that were being used, and what that would work out on a daily or an hourly basis. Does that make sense?

Anisha: Yeah. No, it does, and it's nice to hear it from your perspective because obviously it's in your home and, you know, you're the one that's benefiting from it. But also, I think, as Matt was explaining, it was about, you know, customers not having to

do anything extra or, you know, be more conscious. It's the heating working with the technology in the background, and it's just nice to know that that's actually what you've experienced.

Paul: That absolutely is, yes. The thermostat is set at 20 degrees, and I haven't touched it since it's been installed, other than to play with it once or twice, and apart from that it's just run its course, and I've never had any trouble with it.

Emily: That's fantastic. Thank you so much for sharing your experiences, Paul. I was also wondering, Adam and Matt, what have been the most important things that you've learned during this project? Have you seen that generally customers are happy? Has there been any data recorded in terms of the reduction in emissions or cost-savings for our customers?

Adam: In terms of learning is that the main thing is comparing the running cost of the ground source heat pumps to properties that are heated by gas. So we have got two properties that were heated by gas central heating and they've been converted over to ground source heat pumps, so they're the first properties that we've ever converted away from gas to low carbon heating. And to be able to demonstrate that the running costs are comparable and also we were able to engage with the customers within those homes and they were happy to switch over to a low carbon heating system was a good learning process for us as well, because obviously most people are familiar with gas central heating and a lot of people would be apprehensive about moving away from that. But actually we've got two happy customers that have moved away from gas central heating, and we can demonstrate that it is still affordable to run whilst also being lower carbon. So, I think that's probably a big learning process for us. And also through having a smart thermostat, they're just providing a huge amount of data that we're able to tap into and learn about when people use their heating and how they're currently using the heating.

That enables us to provide advice where we need to. If people aren't using it as we expect or aren't using the heating as much, as we've had some instances where heating isn't turned on very much and we've been able to contact those customers and just understand why that is. And actually their property is just quite warm, it's well insulated and the orientation of their particular property means that they don't need to have it on too long. But definitely the fact that we can use smart thermostats to provide all that information for us has been really helpful and something that we will be looking to run other schemes moving forward.

Matthew: From our perspective, at the moment the system is running quite similar to a normal ground source and that's what we do up and down the country. So the savings we're seeing here are pretty much the same as we see everywhere, particularly when we take out night storage heaters and switch them over to ground source. The sort of 30% to 50% saving on bills that we see across the country has been replicated here, so it's just added to that – it's not a surprise, in some ways. The information coming back from the smart thermostat has been really useful and we're starting to unpick how some of the residents are using energy in different ways and starting to get some good information around that. The really big thing is going to happen when we start doing this smart control. That's the thing that's never really been done before on this scale and this type of property. It's a real shame for us that the energy market generally went crazy just about almost a week that we were about to switch on the smart controls for the first property, so we've put that off until it comes down, but that's the bit we're really excited about.

For me, I get to see... I think we did around 2,500 properties last year, so you can imagine I don't get to spend that much time with all the people. Because this is part of the Energy Superhub Oxford, I visited the site lots of times on this one and got to meet quite a few of the residents and, yeah, it's actually been really useful for me to have those conversations and, you know, drop in and chat with Paul, for instance, for a while and catch up and hear what Paul says about his neighbours as well. It's been really useful for us so, yeah, having that extra time to spend with people that are part of the Innovate UK funding has allowed... has been really useful for us.

Emily: Fantastic, and what do you think projects like this will mean for the future of decarbonising homes?

Matthew: It should enable it to happen faster and to a larger scale. If we can reduce the cost of running a system – as Alan said, we've got the people there, two of the 60 were from gas, and they're reasonably happy with that switch over. When we do the smart controls, we actually think we can save them money compared to gas, which will be a real first. So coming along and saying you can have a low carbon system that's actually cheaper to run than gas really would be something that would accelerate the transition. When we look at the wider scheme, the government is planning to use heat pumps in general, not necessarily ground source, but heat pumps in general as their main tool for decarbonising heating.

The Committee on Climate Change are recommending around 1.1 million – a year – systems are fitted by 2030. And once you start getting into the millions of heat pumps, operating them with ground source, which is more efficient anyway, which uses less electricity, puts less strain, and then operating them at times when the grid can handle it, will make an absolutely huge difference to the effects that it has on the grid. So all of those hidden costs of upgrading the wires, the transformers, the big distribution centres – all of those costs would have to be factored in will be far, far lower if you do it in the way that we're demonstrating here at Energy Superhub Oxford. So, although it's 60 properties, and as I said, it's a big step forward in showing you can scale up, actually, when you look ahead to the really big challenge of that mass decarbonisation, we're convinced already by the data we're seeing that taking this approach will save not only millions, but probably even billions on upgrading that national infrastructure. So that's really exciting for us, and we'll be analysing that data in more detail and kind of quantifying those savings over the next six to 12 months, and look forward to seeing those numbers coming out.

Emily: Wow, so do we.

Adam: Yeah, I think just to add to that as well; sorry, Emily, but...just to add to that, as well as the cost savings, it also means we're not waiting for that network infrastructure to be upgraded. We can get on and start to install these systems without having to rely on third parties to be upgrading the network to enable it to happen. So it does mean we can move more quickly as well.

Emily: Yeah, definitely, thank you for adding that. And Paul, I wondered if I could ask you what your neighbours have said to you about the project, you know, Matt was talking about the importance of being able to come and discuss with customers on the scheme. What are you discussing amongst yourselves? Can you share with us?

Paul: To be honest, the only thing I can say to them is when I was on storage heaters it was costing me about £4 a day, sometimes a bit over – because there's only electricity here, there's no gas. So in terms of electric, I'm spending at least £4 a

day and now I'm on an average of £2.80 a day. And so, that in itself speaks volumes, doesn't it?

Anisha: Definitely, especially, sort of, given, you know, the news that came out recently about rising living costs and we know, sort of, the impact of inflation and national insurance and all these things this year, those savings are so important for people all across the country. So, in addition to this project, Adam, are there any other technologies that you're exploring or initiatives that you're currently leading on for Stonewater, which are aiming to improve the efficiency of our existing homes?

Adam: We've got a few projects that we're planning over the next 12 months. One of the main ones that we're really excited about is actually working with Kensa again on further innovation. So Kensa have got a new product, which I'm not allowed to say too much about yet because they're going through the process of getting that innovation protected, but we're looking to do a small extension of the Energy Superhub project. So working within Oxfordshire again using Kensa's latest heat pump product and Stonewater's homes will be the first homes where that's actually being trialled with customers and occupants within the property. So really excited about using that and seeing how that works out. It should have the opportunity to further reduce running costs for customers and also further reduce that strain on the grid that Matt was talking about. So that's a really exciting one.

Another project we are in the early stages of looking at is looking at the combination of hybrid heat pumps with solar PV and battery storage. Just looking at that for our properties where we've got less space outside where ground source or traditional air source heat pumps might not be feasible, where we might be able to look at alternative technologies and use hybrid heat pumps as a stepping stone to decarbonising those properties until we've got solutions that can fully decarbonise the heating. Also making use of smart controls and using the heat pump element of the hybrid heat pump when electricity is cheap, as Matt was saying, but then using the gas to top up when electricity isn't so cheap and we need a bit of extra heat within the home. So, it'll be interesting to see how that works out and balancing all of the different technologies that we're looking to use within those properties to get maximum benefit for customers and maximum carbon savings. So they're the main two that we've got lined up.

Emily: Wonderful. Thank you, Adam.

Anisha: I think that decarbonising homes is often discussed as being such a huge task. But Matt, I'm interested to get your thoughts on what you would like to see from the social housing sector this year in terms of tackling that challenge.

Matthew: I'd like to just see us build upon what we've done over the last six or seven years. So it is just taking schemes that when we started in 2012, doing this type of work, you know, 30, 40 homes was a big project and we're now doing 60, 70, 100. We've got a few projects that are even as much as 400 homes at the same time on a site and it's taking those to 1000, to a whole postcode area and starting just to increase the scale. So, the more we can do in social housing, we find actually is going to be the kind of forerunner for doing it on a mass scale for private homes. So it's all the same skills, particularly social housing retrofit is very similar skills to doing, say, a postcode district of a city like Bristol or Manchester or Birmingham. So it's almost like practising – it's a horrible way of saying it because it's actually very important in its own right to do this work, but if, you know, if we get to the stage where there's hundreds of thousands of social homes being decarbonised in this

way, we're actually honing those skills to do the millions of homes that need to be decarbonised by 2050. So we've only got 28 years to do that bit, so if the social landlords can lead, you know, between now and 2030, then we're really paving the way for that acceleration, and that bigger piece that's all the private homes that are out there.

Emily: We are really at the forefront, aren't we? It's very exciting. Well, I think that's probably all we have time for today. Anisha, thank you so much for having me, and Adam, Matt and Paul, thank you for joining us. The Energy Superhub Oxford has been a really exciting project for Stonewater to be involved in, so it was great to be able to pick each of your brains and find out more about its actual impact.

Anisha: Yeah, it was a really interesting episode, and thank you again to everyone for being here today, and obviously to all our listeners for tuning in. I think it would be great to follow up on some of the initiatives that Adam spoke about at some point in the future, I'm looking forward to getting an update on those. If you're interested in learning more about the project, please check out our show notes where we'll pop in relevant links and plenty of further food for thought on today's topic. Until next time, thanks again and stay safe.