HOUSE OF COMMONS

Energy Security and Net Zero Committee

Oral evidence: A flexible Grid for the future, HC 113

Wednesday 8 November 2023

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Watch the meeting

Members present: Angus Brendan MacNeil (Chair); Vicky Ford; Barry Gardiner; Mark Garnier; Mark Jenkinson; Lloyd Russell-Moyle.

Questions 1 - 121

Witnesses

I: Sarah Honan, Policy Manager for Demand Side Flexibility, Association for Decentralised Energy (ADE); James Johnston, CEO and Co-founder, Piclo; Jenny Russon, Research and Campaigns Officer, MCS Foundation.

II: Dr Mary Gillie, Founder and Director, Energy Local; Dan Stone, Senior Planner for Net Zero, Centre for Sustainable Energy; Mark Apsey, Managing Director, Ameresco.

Written evidence from witnesses:

- Association for Decentralised Energy
- Piclo
- MCS Foundation
- Energy Local
- Centre for Sustainable Energy
- Ameresco

Examination of witnesses

Witnesses: Sarah Honan, James Johnston and Jenny Russon.

Q1 **Chair:** Good morning and welcome to the Energy Security and Net Zero Committee. This is a session on flexibility, local energy and decentralisation, the first of such sessions. We have two panels today, our first panel with three witnesses and the second panel with three witnesses. I will allow the panel to introduce themselves as they choose—name, rank and serial number, on your own terms—starting on my left with Sarah.

Sarah Honan: I am the flexibility policy manager for the Association for Decentralised Energy.

James Johnston: I am the CEO and co-founder of Piclo, which is an energy start-up. We have a grid flexibility marketplace in the UK and abroad.

Jenny Russon: I am the Research and Campaigns Officer for MCS Foundation, which is a charity, and its mission is to decarbonise homes, heat and energy.

Q2 **Chair:** Thank you for being here. Just to kick us off, I am not sure who wants to tackle this first, but we can see what emerges. What do we mean by flexibility and how could increasing flexibility help to integrate renewable generation into the electricity system more cost effectively? There is a polite pause there. Sarah, you seem to be taking this.

Sarah Honan: Thanks and good morning. The generation and consumption of electricity needs to be matched or kept in balance at all times. If there are lots of people at home watching "Bake Off" or the Rugby World cup final, then we may need to increase our generation in order to meet that extra demand. Likewise, if there is not that much demand on the system because it is an unusually warm October, then we may need to decrease the amount of generation that is being produced. In essence, flexibility is about how we match or balance the supply and demand of electricity hour by hour, day by day, minute by minute, second by second. Historically how we have done that is the National Grid Electricity System Operator instructs emissions heavy gas plants to either turn up or turn down. To this day, this still takes up about 75% of our balancing markets.

We need to distinguish here between energy balancing and grid balancing. Energy balancing is what we have talked about, matching supply and demand. Grid balancing refers to the capabilities of our physical network and how much electricity can be transported across the wires we have at any given time without causing a traffic jam or a constraint. This is where the intermittent renewables question comes in because as we build more intermittent renewables, say off the coast of Scotland, but the highest demand remains in the south of England, we

need to be able to transport that energy across the grid without causing more physical constraints.

One type of flexibility to do this is demand-side flexibility, which I know we are focusing on in this panel, and that involves changing the amount of electricity we consume or demand in response to either an energy-balancing need or a grid-balancing need. It is estimated that demand-side flexibility could save the system somewhere between £5 billion a year by 2050 and could avoid us building four new gas plants by 2030, which of course will help us reach our net zero goals faster.

Chair: I am seeing some agreement there. Does anybody else want to comment on that point?

James Johnston: The area that we have been focusing on is helping the grids go through this energy transition and enabling the use of flexibility to go alongside the necessary investments in grid upgrades that we need to get to net zero. This is not an either/or question; this is a both question. We need to have the right-sized network and the key point is the right size. We should not overbuild; we should not have a vastly underutilised network where bottlenecks are only occurring several days a year in certain parts. We need to have the right size, and flexibility provides a key, cost-effective and basically very speedy way to resolve these issues so that we are not having to wait years or even decades for some of the bigger grid upgrades to come through. It can get us to the energy transition quicker.

Q3 **Chair:** Sarah mentioned that this could save the building of four gas plants by 2030, so that is the next seven years. I have heard people say that the UK has to build five times the amount that was built in the last 30 years in the next seven years. Is there much talk between those who are saying we need to build a network and those who say we can do a bit of management? Jenny, you have nodded.

Jenny Russon: MCS Foundation undoubtedly believe that we need to have network reinforcement, as electricity demand is expected to double in 2035 as a result of the decarbonisation of heat and transport. However, the only way to approach this in the most cost-effective way is by incorporating flexibility. MCS Foundation recently commissioned a research report by energy experts, Regen, on what is needed to have a net zero grid by 2035. One of the conclusions of that report was that the grid can support the electrification of heat and transport, but that we need to make strategic investment at both a distribution level and transmission level.

However, the report also talks about the importance of flexibility in limiting the amount of network reinforcement. A report by Carbon Trust and Imperial College London said that incorporating flexibility could save £2 billion on network reinforcements per year by 2050. We need to move away from the concept that it is either/or—either flexibility or network reinforcement—because the conventional way we have always

approached system development is to follow the rise in demand. To put it simply, generally our demand is at 50 GW, but when people are watching "The Great British Bake Off", this increases to 100 GW. We have always made sure that we have had enough energy generation and enough network capacity to support this 100 GW. But in a net zero challenge, when we need to increase the amount of small-scale renewables on the distribution network, it is simply not the most cost-effective way to build more grid to meet this peak demand. We need to incorporate flexibility as well.

Q4 **Chair:** What will this look like for the consumer when it is flexible?

Jenny Russon: Absolutely. Obviously our mission is to decarbonise homes, heat and energy. Domestic flexibility can play a significant role in contributing to our flexibility needs in the system. In terms of the benefits for the consumer, if we have a high flexibility scenario by 2040, it would save consumer energy bills £370 per year, according to a Cornwall Insight report. The benefits of consumers participating in flexibility are—

Chair: What will that mean for the consumer? Will that mean you don't turn on your washing machine, your tumble dryer or whatever?

Jenny Russon: Yes. The definition of domestic flexibility is when a consumer either increases, decreases or shifts their energy demand according to a price signal. That is to offer the same service that Sarah was talking about, so a service to the electricity system provider, but the idea—

Q5 **Chair:** Do you see that coming in as personal vigilance or AI playing a role?

Jenny Russon: Automation will be an absolutely essential part of unlocking domestic flexibility. It needs to be easy for the consumer so that shifting their electricity consumption doesn't impact on their daily life. For example, smart renewable technologies like your EV charging, if you plug in your EV charger, through automation it will charge your car up for you when it is best for the grid and also when it is best for you. You can make the most of cheap electricity prices. It is about consumers changing the way that they interact with the electricity system. A way of looking at it is in a fossil-fuel system, households can only be consumers, whereas with electrification it is bidirectional. Consumers can start offering services to the grid.

Q6 **Chair:** That was my final point. Distribution gets termed at the moment as distribution lines, but with this flexibility, surely they will become transmission lines of some form and that has to be managed and controlled as well.

Jenny Russon: Yes, absolutely. In terms of distributed flexibility for domestic flexibility, there is a potential in future for new business models where flexibility service providers will be able to represent consumers in

different flexibility markets. We are not just talking about the time-of-use tariffs, we are talking about participating in the capacity market, balancing market. That is at a transmission level as well. We tend to have a mindset of considering one household in isolation, but if you have one household that has a 4 kW solar panel and a 4 kW battery storage, and you aggregate those homes—say 1 million homes—that is 4 GW of potential energy capacity generation and 4 GW of storage. We need to stop thinking of homes in isolation and aggregate what contribution they can play to the grid.

Chair: Probably more of this will come up later, but I am anxious to move on, given the time.

Q7 **Mark Jenkinson:** I want to start with Sarah. We have heard about the importance of smart meter technology and dedicated asset meters in facilitating distributed flexibility. To what extent do current regulations and product standards support the growth of those technologies?

Sarah Honan: A very good question. Smart meter rollout is something Jenny could probably speak better to than me, but when we talk about dedicated asset metering devices, we are entering this interesting new phase for the flexibility sector because flex providers are about to be licensed for the first time. The Energy Act empowers the Government to do two things: first, devise a licensing framework for the companies that provide flexibility services; and, secondly, establish a minimum standards regime for appliances that can be smart, such as heat pumps, electric vehicle chargers and whitegoods.

Unfortunately, over the last year differences and a conflict between the Electric Vehicles (Smart Charge Points) Regulations 2021 and an older piece of retained EU law, the Measuring Instruments Regulations 2016, have emerged. These differences would be like the equivalent of writing a piece of legislation where you say all mobile phones need to be able to make calls and setting out standards for that, but then failing to mention anywhere within that legislation that if you ever want to make a call, you have to be compliant with this whole set of older regulations that are not mentioned anywhere.

We have conducted extensive statutory interpretation, regulatory and policy analysis and market evidence-gathering that have all come to the same conclusion: the UK Government were an absolute leader in making sure that EV chargers would be able to participate in demand-side flexibility. In fact, they mandate it, but they do not go on to say that there is this older, less-targeted set of regulations that will prohibit customers, early adopters and businesses from using those device-level meters from participating in demand-side flexibility. Often these were rolled out with the assistance of government grants.

This can be rectified through amending schedule 2 of the Measuring Instruments Regulations. DESNZ is about to consult on the second phase

of the energy smart appliance regulations, and this would be the perfect place to start advancing that amendment.

Mark Jenkinson: I was processing that. James, do you have anything to add to that?

James Johnston: When we look at regulatory barriers, the thing I would focus in on is incentives rather than barriers. We need to get the incentives right for all the different actors. Flexibility markets are inherently complex. We start these types of sessions explaining what flexibility is, because it is not obvious. There are multiple different technology types; there are multiple different ways to participate; there are multiple different use cases for flexibility. Complexity here is a barrier in lots of different ways.

A key thing in terms of background information, flexibility providers—these could be an EV-charging operator or a battery operator or a wind farm operator—are actively making decisions on what they do with their assets all the time. It is not like with renewables where you fit and forget and it produces. You have to make decisions on when you inject power or take power off the grid. Basically they have to make active decisions about which services at which given time they are providing those services. This concept—in the sector called "revenue stacking"—is fundamental because you have to essentially participate in at least three or four different markets to make enough income per annum to underwrite your investment case. Again, this revenue-stacking concept is complex.

We need to have the right design of the markets and the right incentives for the system operators and network operators so that you can stack these different things efficiently. This all sounds very good, but then if one market has a certain set of rules, such as "If you take part in our market you cannot take part in their market", then you stop investment into the space. You are not able to underpin an investment case to drive more batteries and more low-carbon technologies into the space.

For us, it is all about the incentives, so there is an incentive for the network operators to work together on this to make sure that there is whole-systems thinking. Basically, coming to our side of things, we are a technology platform that tries to piece these pieces together. On interoperability, what we come across all the time is different silos, different regulations, different historical reasons and different markets working in silos. We need to break that down and bring these things together. Talking about the high-level benefits out to 2030 and 2050, we will not get there unless we break down these silos, we align these incentives and get this whole system working together.

Jenny Russon: I could not agree more, talking about taking a more holistic approach to have a more consistent regulatory framework. One thing that we consider to be vital to unlocking domestic flexibility in particular is around the Future Homes Standard. This is the regulation

aims to reduce carbon emissions in new build homes by 75% compared to the part L 2013 regulation. This is an opportunity to make sure that we are building homes that are smart, interoperable and are fit for the future. This should include mandating solar panels and some forms of storage, so battery storage and thermal storage.

An Aurora Energy report predicted that we need around 18 GW by 2035 of this short-term, short-duration storage. These are battery storage that can last between two to four hours. On average, if we build 200,000 new-build homes a year from 2025 to 2035, if my maths is correct, that is around 2 million homes. If 2 million homes had a 4 kW battery storage system, that could contribute 8 GW towards this short-term, short-duration storage. I completely agree, we need to take a holistic approach to regulation and make sure all the net zero regulation is in alignment to fully unlock the potential of flexibility, because it is complex and it has a place in many different sectors.

Q8 **Mark Jenkinson:** Sarah, to return to the comments on the Measuring Instruments Regulations, what sort of things is it? Is it just car charging currently that that affects predominantly?

Sarah Honan: The Measuring Instruments Regulations cover a whole bunch of different measuring instruments—gas meters, loads of different things—but they also reference electricity meters. In the context of flexibility, the only flexible asset or device level meter that has also been regulated for is EV smart charge points. At the moment, yes, but because of the Energy Act, DESNZ is about to make a whole new set of regulations for other smart appliances. We will fall into the same trap, essentially, if we do not address it.

Q9 **Mark Jenkinson:** This is about measuring the demand shifted or put back into the grid, for example?

Sarah Honan: Yes. The flow of electricity in and out, but there are arcane requirements in the Measuring Instruments Regulations. You need an in-built display, whereas the EV regulations say you just need an interface to be able to read the results, so an app or a computer. Another thing is that the EV regulations say you can self-certify compliance with the regulations, whereas the Measuring Instruments Regulations require you to go through an external certification process.

Q10 **Mark Jenkinson:** You said you had done some work on regulatory environment. Is that as simple as removing it from the schedule?

Sarah Honan: Yes. Schedule 2 of the MIR already excludes meters and devices approved under the Electricity Act 1985. You could arguably do the same thing with the Automated and Electric Vehicles Act 2018 and the Energy Act 2023.

Q11 **Chair:** Briefly, before we move on, Jenny, you talked about the 4 kW battery storage and I think it was 200,000 new homes in a decade.

Jenny Russon: Yes.

Chair: What would that add to the price of a home? How much would one of these battery storage units in a house be?

Jenny Russon: It is a good question. It is hard to get exact figures on how much it costs for a developer to install a new battery, but we did some rough approximation using our data from the MCS data dashboard, and to install a solar panel array, battery storage and a heat pump in a retrofit project costs around £33,000 in 2023. We worked out that it would be three to four times cheaper for a developer to put this into a new build home. So even if it did cost—

Chair: £8,000 to £11,000?

Jenny Russon: Yes, £8,000 to £11,000. We are commissioning a piece of research that I can send to the Committee when it is published. It is looking at the energy bill savings over the lifetime of the property, more specifically over a 25-year mortgage period.

Q12 **Chair:** The heat pump element of it—the heat pump is always very expensive in a retrofit, but if you were to do the solar panel and the 4 kW battery alone—

Barry Gardiner: And doing it at scale?

Chair: At scale, yes.

Jenny Russon: The heat pump part for a new build home is around £5,000, according to Government statistics a couple of years ago.

Chair: Solar panels and the battery, you are talking £3,000 to £6,000 on a new home?

Jenny Russon: Yes.

Chair: At scale, as Barry has pointed out.

Jenny Russon: Yes. We did a bit of research or we are in the process of carrying out a piece of research looking at the energy bill savings over a 25-year mortgage period.

Q13 **Chair:** This is my next point: how long would it take you to recoup the £3,000 to £6,000 outlay that would be spent?

Jenny Russon: I will definitely send the report when it is published, but it is looking like over a mortgage period you would make back the deposit that you put down on the house. Say you were to buy a £400,000 house, you would be saving approximately £40,000 in a 25-year period.

Chair: You would make it back within five years?

Jenny Russon: You would make it back quickly. What we are saying is that it is so much cheaper for developers to install these technologies.

The benefits to the consumers are that it saves a significant amount on energy bills. The benefits are also for the system in that it provides the grid with this short-duration storage and it also helps to mitigate against peaks. The energy generation of a solar panel is usually during the day, but we usually see peak energy demands between 4 pm and 7 pm. Having battery storage in place as well, it reduces the amount of electricity being exported back to the grid by around 60% to 80%. It means that during those peak times the home can make the most of that energy generation that they have made during the day.

Q14 **Vicky Ford:** I hear you. When you push Ministers on this, that there should be a solar panel on every new build house, which I have done a number of times, they come back and say solar panels are not suitable for every single house. There may be some homes that are under shade or the wrong direction or whatever. What is your view on that? Should there be exemptions to that policy?

Jenny Russon: Absolutely. If it is not appropriate, yes.

Q15 **Chair:** Before I went to James, you mentioned the complexity and terms that people talk about. Before I go on to the next bit, we talk about capacity markets and balancing mechanisms but it occurs to me that the many viewers that will be watching this are maybe not completely au fait with those terms. Can anybody briefly lay out capacity markets and balancing mechanisms for the layman? That is a challenge for one of the three of you.

Sarah Honan: If we are talking in layman's terms, we have the transmission network, which is like the highways and transports electricity across our system, then you have the distribution networks, which are your local streets that bring the electricity into your home.

Chair: They are the smaller wires that come into the big wires.

Sarah Honan: Exactly. We have six distribution network operators—six main ones—and one electricity system operator at the transmission level: the ESO. Both of those systems have increasingly integrating but different needs for balancing, going back to what we talked about at the beginning. Therefore they have different markets for balancing and different mechanisms for balancing. If we are looking at the transmission level then you have advance services, things the ESO can buy a day ahead in order to have stuff on standby. Then there is the balancing mechanism, which is real time. Imagine the control room right now, control room engineers—

Chair: The capacity markets the day ahead where they go and see—

Sarah Honan: The capacity market is a totally different thing. It is almost a subsidy scheme for making sure we have the right security of supply for the future. These real time—or at least close to real time—markets are the ones run by the transmission and distribution system operators. But what is important to note here is that these markets were

built with large, high-emitting generators in mind. They were not built thinking about the symbiotic—

Chair: The 4 kW units in houses.

Sarah Honan: Exactly, the symbiotic bidirectional relationship that will come from flexibility. Making sure that we are not basing the standards for the future on the rules of the past is absolutely crucial. Also when you are thinking about this, you are talking about seven entities essentially buying the lion's share of a commodity, that commodity being flexibility. When a small number of entities are doing that, that demands absolute transparency and accountability. What we say is that when there are only a few gatekeepers to the marketplace, the burden of proof should not be upon those seeking access to prove why, but upon the gatekeepers to prove why not.

Q16 **Chair:** The core of the question is: how do things need to change to support the growth of flexibility? You have said that there are a small number, but I am presuming that you are thinking of a bigger number in the future.

Sarah Honan: There are a small number of market buyers but lots of market sellers. James can probably speak to that.

James Johnston: First, on this point about transparency, this is very much why we set up the business as this transparent marketplace where you can go and see where all these different markets are and all the different buyers. We codify transparent decision-making processes into the rules of our marketplace. I know that is of great acceptance to our providers of flexibility, that they know why decisions are being made. What they don't want to hear is just that the old power stations, because they are pals with someone in the control room, are being dispatched because they have always been dispatched. They want to know that the most economical solution that meets the technical requirements has been activated. This point about transparency is key.

The way that we are starting to think about this is there are all these different markets that speak their own language. If you are a participant in this market, the sector, you need to become proficient in these 15 to 20 different languages so that you can operate your asset. That is challenging. That is the role again of a marketplace, to translate that into a common language so that you can start to add these things together and the business model makes sense. For me, that is the key to the future.

Chair: I might come back to a point you have raised, but with time being time, I will take in Barry Gardiner and then Lloyd Russell-Moyle will be operating in this area as well.

Q17 **Barry Gardiner:** The evidence you have given us so far has been excellent. I have enjoyed listening to you all. It is precisely to pick up on

this idea of distributed flexibility. James, perhaps you could tell us about the work that Piclo has done here. How do you get the distribution network operators, the electricity system operators and the future system operators all working together? What incentives do you need? What regulatory framework do you need in order to ensure that has happened? If you give us an instance through the work that you have been doing with Piclo.

James Johnston: First, to give context for why we have particularly good insight is we are working across six countries globally. The UK is a leader worldwide. A lot of countries are looking at us and going, "Right, how can we copy this? What are the good bits? What are the lessons learned?" We are doing a lot of things right and that comes down to the regulatory framework—the totex regulatory framework that has been in place now for several years—which provides the right incentive for the distribution networks so that they are not just incentivised to build a bigger grid, but if they do smarter things they can take a share of the benefits. For me, that is the first crucial element that we are trying to get the rest of the world to adopt.

Getting into the specifics, that is just getting started. You get the right incentives and the networks say, "We can work with this." Visibility is the first challenge and that is where we started. We developed our platform as a visibility tool on behalf of the networks, showcasing where they had regional or locational bottlenecks on the grid, where they had basically a need for flexibility and then matching them up with the EV chargers, the batteries, the demand response, domestic, commercial, that visibility and that kind of communication. Then it is about adding additional services, facilitating the dispatch, the measurement and the payments of the end-to-end journey. That is where we are now.

At the moment we run the markets for a number of distribution networks and we run a locational market for the electricity system operator as well, but they all still exist as silos. The next exciting phase of the market is bringing this all together. As an innovator, we are doing our bit. We are developing new propositions for the market to connect the dots, but there is a lot that needs to be done from a regulatory perspective. There are new governing bodies that we think need to come into place.

We think a key one is a market facilitator, which Ofgem is consulting on. We need somebody that will have whole systems thinking, that has teeth to break down some of these silos, to basically say, "You cannot have exclusivity on your particular market because it is very important to you, Mr System Operator" because here Mr System Operator is then locked out of that asset because that asset can only operate in one market. We need that whole-systems thinking. We think the market facilitator role that Ofgem is consulting on will be critical and the design of that function will be critical.

Q18 **Barry Gardiner:** I want to ask you about the collection and availability or transparency of data, whether that is something that there should be

mandatory targets for.

James Johnston: Again, the keyword is incentives. We have facilitated over a gigawatt of flexibility transactions on our platform. We have 16 GW of registered assets across almost 100,000 assets. Why do we have all those data? Because there is an incentive to upload it into a platform. Ultimately you can either take part and provide your flexibility or you can request flexibility. When I think about data-sharing, the key thing is to get the incentives right because providers will share their data. They will find ways to give you access if they have the right incentives to do it. That goes both ways.

Q19 **Barry Gardiner:** We heard from the British Hydropower Association. It thinks that distribution network operators should be given innovation targets and give more consideration to how innovation projects can benefit the consumers. Is that something that you think should be happening from Government, that those targets for innovation should be happening more?

James Johnston: I think we have to be very careful with innovation projects. We have had a number of experiences with them. They are very good for proving out technology, but this is not a technology challenge. This is a market structure, market design and business model challenge. We think that goes alongside innovation funding to prove out different technology types, but where we need innovation is almost forward-thinking regulation. Forward-thinking structures are more important at this stage in the market development.

Q20 **Barry Gardiner:** Should there be mandatory annual targets to roll out active network management, dynamic line rating and flexibility digitisation? Again, should that be something that is coming from Government for the DNOs?

James Johnston: I personally think it is more about the incentives. As we go through the energy transition, there will be different use cases of flexibility, different things emerge, and if we get too prescriptive about specific technologies being implemented then we might get ourselves caught up in a trap. It is about getting incentives right and then policing and regulating the entities to deliver.

Q21 **Barry Gardiner:** What are the best incentives that we could be giving?

Sarah Honan: First, an active network management. That is uncompensated flexibility, so at the ADE at least, we don't think that that should be rolled out at more pace.

Coming back to James's point on the innovation thing, we come to the end of innovation projects, have brilliant proof of concept and then we go to a control room and they say, "No, we need this data" that maybe was suitable for a multimillion-pound gas plant to provide, but is not cost effective for an EV to provide. This goes back to this burden of proof issue, that if a rule looks outdated or does not pass a sniff test for

discrimination, then the presumption should be that it is either repealed or removed and all evidence is disclosed to the public. It is those technical rules that are often creating the biggest barriers to entry to markets for flexibility. Once you can enter those markets, that is when we get to the incentives.

Q22 **Barry Gardiner:** This Committee has to make recommendations. Give me what you think those recommendations should be about the rules that are outdated and should be got rid of. Are there too many?

Sarah Honan: There are too many, but I think a recommendation should be that for the future system operator, more stringent standards for transparency and accountability are enacted once it is created and that there is a burden of proof that it has to fulfil to justify any seemingly or prima facie discriminatory rule. It has to basically conduct a proportionality test if it wants to keep any rule that seems discriminatory.

Q23 **Lloyd Russell-Moyle:** Does the FSO, when it gets in, have the teeth to be able to start requiring this data? Does it have the ability to insist that it is all made available to it without redaction?

Sarah Honan: It already does. As earlier, the ESO sets the rules for its own marketplaces. Then it is up to industry, if we think some of these rules are outdated, to prove why they are outdated, as opposed to it proving to us why they are necessary. It is looking at the data requirements that needs to happen with the FSO.

Q24 **Lloyd Russell-Moyle:** You are hoping the FSO will change its approach?

Sarah Honan: Massive cultural change.

Q25 **Lloyd Russell-Moyle:** Do you think that is possible in the way that it is being set up now?

Sarah Honan: In our opinion, there has not been enough focus on that cultural change, no.

Q26 **Lloyd Russell-Moyle:** We have the legislative underpinning, but does it need to be clearer that it has a duty to be co-operative, but also to be proactive in allowing people to enter the market?

Sarah Honan: Absolutely. We are transforming a private company into a public body and that demands far different standards around transparency and accountability that Government should be driving.

Lloyd Russell-Moyle: But still it is based within a market framework.

Sarah Honan: Yes.

Q27 **Lloyd Russell-Moyle:** The question is: does a market framework produce good outcomes for future long-term investment? At the moment it produces good outcomes for what the need is now, but not necessarily what the predicted need is. What interventions need to happen to incentivise what is needed for the future, not incentivise what is needed

for now?

Sarah Honan: This is an important point because we cannot wait until all these heat pumps are in houses and EVs are in driveways to start making these markets accessible to them, because at that stage it will be too late. Opening up these markets now is how we protect that future need. Otherwise we will have millions of EVs, millions of heat pumps, and the ESO control room or the FSO control room will be taking more actions and spending more money because their own rules do not allow these technologies to participate.

Q28 **Lloyd Russell-Moyle:** Is it your view that the FSO control room does not individually control each of those smart things, but that there is some middleman that does that and they then go collectively to that provider?

Sarah Honan: That is the role of the flexibility provider, or some people get you to do flexibility through their supplier and then put it into a big bundle, which importantly gets to the same accuracy levels that they want from one big gas plant. Yes, the FSO need to become far more automated and far more digitalised. At the end of the day, it still uses fax machines, so that is the level of automation we have right now.

Q29 **Lloyd Russell-Moyle:** Clearly that needs to change. Is the reward balance right at the moment between—Jenny, you mentioned this—infrastructure developments and flexibility? Because at the moment the reward is very much based in the old model of what physical infrastructure you have and then we pay for. How do we need to change that to make sure that the reward is right for DSOs and National Grid?

Jenny Russon: The first thing, importantly, to raise is that in order to know what the right balance is between network reinforcement and flexibility, we need to have a whole system approach to energy planning. We talk about the FSO. That will be hugely important moving forward, as it will be a body that takes on not just whole-system planning, but also regional planning. One in particular is more visibility of assets on the low-voltage network because there is evidence to suggest that the DNOs have quite fair visibility on the primary low voltage, so a slightly higher voltage, but on the secondary low voltage, there is a lack of visibility.

Q30 **Lloyd Russell-Moyle:** Is that a lack of visibility just because they do not know or is it a lack of visibility because someone is not sharing information with the right people?

Jenny Russon: It is a good question. Maybe Sarah and James will want to add to this. One thing that we advocate for, especially as the demand for electric vehicles, heat pumps and other small-scale renewables increases, is to have a more automated approach in how contractors get a connection to the grid. If that is automatic, then it is very easy for us to have better visibility of where these assets are.

We are commissioning a piece of research from Regen following on from what the grid needs to decarbonise, to look at low voltage. I am happy to

send that to the Committee moving forward because I think it will be very interesting to understand what the current headroom is in low voltage because of course this is absolutely essential. One thing that solar heat pumps all have in common is they need a connection to the grid in the low voltage network. If there is not the capacity, we could risk delaying the decarbonisation of heat and transport.

Q31 **Lloyd Russell-Moyle:** And the capacity to sell within the low-voltage grid between different people. The FSO is clearly taking on the old National Grid DSO capacity for real time, but are you saying that it needs to delve into some of the distributive network real-time management as well?

Jenny Russon: What I am saying is that I definitely think—and this is the intention for the FSO—it needs to take a stronger role in whole system planning and understanding what is needed from both a strategic network development perspective, but also where flexibility can play alongside network reinforcement.

Sarah Honan: I think the interaction between distribution and transmission is quite at the heart of what you do.

James Johnston: Yes, I think operationally managing real-time power flows is the expertise that the distribution networks have built up and makes sense. It is the interface between the two networks. We see that the FSO need to play more of a stronger role, not just within electricity networks, but also in other verticals as well.

Coming back to a couple of points that you raised: on our platform we are running one of the ESO's markets. What that means practically, our platform is used in the National Grid ESO control room. We have a transparent selection process. We have residential assets via aggregators bidding in and this is providing a whole system benefit. It is not only reducing the cost for managing curtailment of wind in Scotland; it is reducing the amount of curtailment of wind by turning up or shifting low-carbon EV charging to soak up that energy in Scotland at that time. It is increased carbon, it is lower cost, it is transparent and it is digital. This is the blueprint.

The ESO is forward leaning. It is the first time that it has worked with a third-party marketplace to deliver like this rather than the more normal route of building kit in-house. We think there are signs of innovations like that that can have all the ingredients. Also as part of this, we are facilitating co-ordination between the distribution and the ESO network, because what we are doing is enabling residential buildings to turn up demand and to soak up that power. There needs to be some co-ordination because the distribution networks want to know what is going on and they want to make sure that is not going to damage their network.

I think what we are seeing is there are hotspots where this full system co-ordination using digital tools works. Our main message is we need to do more of the stuff that works. There can be a lot of debate around how we redesign some of the major institutional structures and market design at a national level. That can take 10 years just to discuss. We need to look more at what is working right now and evolve these.

Q32 **Lloyd Russell-Moyle:** You mentioned that Ofgem is currently consulting on a market regulator. Is that right?

James Johnston: Market facilitator role.

Q33 **Lloyd Russell-Moyle:** A market facilitator. We are getting to the stage where there are a lot of different new bodies being established or roles being established. Is that a role that you foresee within Ofgem or within the FSO?

James Johnston: There are a couple of options that will be put forward, including the FSO, to run that. We see it as an important governing body for that whole system co-ordination.

Q34 **Lloyd Russell-Moyle:** Could it be that the FSO has that wider remit as well?

James Johnston: Yes.

Q35 **Chair:** Briefly, before I come on to Vicky Ford, you said at the beginning Piclo operates in a number of countries. Are there some places that are better geared for the future than others, less encumbered by legacy rules or special interests?

James Johnston: Broadly, no. Energy markets are complex places everywhere. There are places where smart meters have been rolled out by the distribution network, which in hindsight would have been easier if we had done something like that here so that there is easier access to data. Ultimately, what is making the UK a world leader here is that from 2015 we have had totex regulation incentives, which incentivises the network to think broader than just building more network. That has been fundamental. The UK was the first to adopt that and others are now following suit. Whether this is in Portugal, Ireland, Italy, New York, where we operate, we are seeing that they are a bit behind the curve. They are essentially demonstrating and proving that flexibility works before these regulatory changes.

Chair: If we had time I would love to investigate further, but I cannot.

Q36 **Vicky Ford:** My questions are about demand-side flexibility, the trials that have happened—particularly questions to Sarah and Jenny. All the chaps take a long time asking their questions so we are now short on time when it comes to me, so I would appreciate clarity. We have seen the two trials, the DFS trial and the EQUINOX. What are the main learning points?

Jenny Russon: First, it was a proof of concept. It allowed the ESO to challenge the need for generators of last resort. In total the reduction equated to 3,300 MWh. To put that into context, that is the equivalent of 10 million—

Vicky Ford: What are the main learning points? Did they work or did they not work? Quickly. I have seven questions.

Jenny Russon: Sorry. The main learning is that we need to do more trials. While they unveiled some interesting findings, one of them was that on average people participated in three or fewer events out of 20. We need to understand why. In the future we need to have more representation. There were some vulnerable groups that were included but there were not many people from the private rented sector. There also were not many people from black and ethnic minority groups. Perhaps more consumer research into how to involve a wider range of groups.

Sarah Honan: Demand flexibility is a reliable source of capacity and therefore we need to move it into in-market services and out of these trials or sandboxes. Secondly, from a customer survey by the Centre for Net Zero, which participated with Octopus, 81% said that they were interested in turning up their energy use to avoid wind curtailment, to some of the points James made, so moving not just from a demand turndown perspective, but to a demand turn up to soak up some renewables. That is the second big one.

Q37 **Vicky Ford:** Interesting. DFS was criticised by Make UK, who said that it did not work for the manufacturing sector. Why?

Sarah Honan: I am not entirely sure.

Q38 **Vicky Ford:** Should we mandate energy suppliers to participate in trials? Should they have to do trials? Should they have to do consumer research relating to trials? Should they be required to communicate potential savings more clearly to consumers?

Sarah Honan: Generalised information campaigns Jenny can speak to better but, no, suppliers are not the only route to flexibility. People can go through independent flexibility providers, who often have better systems built up to do flexibility, because the supplier-customer relationship is very one-directional, "Here is your power, thank you very much," whereas flexibility providers are focused on that bi-directionality.

Q39 **Vicky Ford:** Could suppliers make sure that their customers are aware that there are flexibility providers if they are not providing flexibility themselves?

Sarah Honan: Suppliers should definitely be incentivised to accelerate the smart meter roll-out and market-wide have early settlement, the two biggest things—apart from low-carbon technologies—that are keeping homes from participating in flex.

Vicky Ford: I do not think my suppliers have ever let me know that I could take part in a demand-side flexibility trial. Shouldn't I know?

Sarah Honan: Arguably, yes. Probably the answer to that would be yes, but I worry about that recommendation because it means putting the supplier on the front foot as to offering flexibility, as opposed to independent flex providers.

Jenny Russon: I agree. One of the findings from the trial was that 85% of people participating learnt about it through their supplier. It does demonstrate that suppliers have a strong role. I am not sure that mandating is the best way to go about it. I also think that there is equally a need for a national awareness campaign and trying to engage consumers in that way as well. Generally the thing that we advise is that there is not one recommendation that will solve everything, that you need a holistic approach and to try different things. Definitely incentivising suppliers, but mandating is not quite what we would suggest.

Q40 **Vicky Ford:** Have any countries done this well in terms of encouraging consumers to take part in these trials and to learn about flexibility?

Jenny Russon: France has done trials, especially with heat pumps. One of the key learnings from that that is important to take forward is that demand-side response should be a choice; it should not be something that consumers are forced into. A report from Cornwall Insight showed that in a high-flexibility scenario, even those consumers who are not participating in demand-side response would still save £100 per year on their energy bills. That demonstrates that it does not have to be a national endeavour. Even if 50% or 25% of consumers can benefit from demand-side flexibility, that is still a positive outcome and a significant contribution. We do not have to mandate that every household participates in this.

Q41 **Vicky Ford:** You have spoken about potentially having a national awareness campaign. You have said that sometimes people have heard about it through suppliers. My concern is that consumers do not have a lot of faith in Government to deliver on this; they often do not have a lot of faith in their supplier. One supplier that I can think of is clearly better than others at having consumer support. However, I do not see a lot of consumers sharing information with each other. The one person who you do trust is your neighbour living in a similar house saying, "Look what I've done and how much money it is saving me." Is there any way that we can encourage more show and tell, consumer to consumer? I would love to have that as a theme. Do you think that that would work?

Jenny Russon: It is an amazing idea. Talking about a heat pump example, in some of the Scandinavian countries one of the ways that people would hear about heat pumps was from people posting on social media about their amazing experiences. It is something that we do not have a culture in the UK. We tend to go on social media to complain

about something, unfortunately. It is a good idea. We need to take a holistic approach with different ideas. Making sure that people have a good experience and talk about it with their neighbours is important.

Q42 **Vicky Ford:** One of the points about these trials is that the analysis showed that it tended to be better-off people who were taking part in the trials. How do we expand that to a more diverse group of consumers? Is it an indication that it will only be better-off people who are taking part in demand response?

Jenny Russon: That is a valid point. One thing that we would suggest is that we need to try to increase the support for a high and equitable roll-out of small-scale renewables. Two of the main challenges from the DFS trial were that either people did not have enough flexible assets—they did not have enough electricity consumption that was flexible—or their electricity consumption was so low that they could not turn down. That means that a household's opportunity to participate in demand-side response becomes much higher when they have small-scale renewables. We need things like the extension of the boiler upgrade scheme or at least potentially higher grants. We also need the extension of 0% VAT to make these technologies more affordable and things like green finance to allow a wider group of people to be able to install these technologies.

Q43 **Vicky Ford:** Given that those technologies like small-scale renewables are only really efficient if your home is properly insulated in the first place, and you have written to us about how poorly homes are insulated, should we be looking at home insulation first before we start other demand-side measures?

Jenny Russon: Energy efficiency is an absolutely vital part to having a flexible grid. It is something that tends to be ignored as well. We recently had a report from Oxford University, which we supported, that demonstrated that if we improved energy efficiency of homes by 25% and all homes had heat pumps it would reduce the peak demand by 10 GW. Therefore we do need to focus on energy efficiency.

Vicky Ford: Ten gigawatts?

Jenny Russon: Yes.

James Johnston: You can treat an energy efficiency measure as a form of flexibility. Ultimately flexibility is about changing from a baseline, "This is what would have happened and by doing this action it is now like this" and then you get rewarded for that. That is energy efficiency.

Q44 **Vicky Ford:** And we shouldn't consider energy efficiency as completely not part of this whole how you manage your grid better.

James Johnston: It is a subset flexibility market.

Q45 **Vicky Ford:** That is a good point. Given the whole system benefits of automating demand-side response, what further work do you think needs

to be done to increase public support for that? I have spoken about consumers being able to share their stories. What else would you recommend?

Sarah Honan: An increase in the roll-out of low-carbon technologies. If you are thinking about consumer flex, you need to think about it in three prongs—hardware, data sharing and markets. We have spoken a lot about markets and data sharing, but getting that hardware into homes is the key thing. As Jenny said, the more electricity use you can shift around, the more you can be rewarded for flexibility. If you think about it in terms of already having loads of energy automation and relying on it, like motion-sensor lights, but we just don't recognise the rewards it gives us, whereas as our energy consumption becomes almost entirely reliant on electrical demand—we do not have to power our cars by petrol and diesel and we do not have to have a separate gas bill for heat—those reward signals will become increasingly noticeable for customers. Therefore it is about having the markets in place when the technologies get in and accelerating the rollout of those technologies.

Q46 **Barry Gardiner:** Can I follow up with one brief question on that? Given that demand reduction benefits both sides of the equation—the customer and the system—should there be a minimum not price, but percentage of the saving that is passed on to the consumer?

Sarah Honan: It is an interesting concept, but not necessarily something akin to the way we trade electricity now. Rewards can be based on two things. You can get a flat fee, what is called an availability fee for being there, or you get paid per kilowatt-hour. The per kilowatt-hour is just how all electricity trading is done. Usually with flex providers and suppliers, the way that it works is that if they are selling and contracting to the system, they will take a margin and pass the rest to the consumer. However, it is hard to imagine how you would start to draw lines of whether you mandate certain percentages get passed on.

Barry Gardiner: Presumably under that system different people could be taking different margins.

Sarah Honan: Yes.

Barry Gardiner: We want to make sure that there is not a fixed but a minimum percentage that is being passed on to the consumer. Otherwise you could end up with a situation where all the benefit is accruing to one party and not to the consumer, or a huge part of the benefit is accruing to one party rather than the consumer.

Sarah Honan: I will let James and Jenny come in, but you will not offer a very attractive service to customers if you are taking a higher margin than your competitors.

Q47 **Barry Gardiner:** You are saying let the market decide?

Sarah Honan: Yes, and that is also why not just going through the supplier, but having those independent flex providers, offers more options for the consumer and they can jump around.

Barry Gardiner: It does. I just wondered if you thought that there should be a minimum.

James Johnston: Some of the fastest growing providers on our platform are not suppliers; they are independent actors selling to residential consumers. Encouraging more participants into the market creates more competition and creates better consumer benefits.

Q48 **Barry Gardiner:** Briefly on digitalisation, Sarah, your organisation, ADE, has talked of the vintage of the control room IT systems currently in use. That was not a very polite way of addressing the fact that the IT systems currently used by the electricity system operator you think are holding back the whole process of renewable generation contributing to flexibility in demand. Can you elaborate on what you think should be done here in terms of IT systems and what is required?

Sarah Honan: ESO is working on it. It is currently designing and deploying the open balancing platform, but making sure that that happens at pace and is used from the get-go is most important. There were some worrying findings from an independent report last year into IT investment by the ESO. It comes back to the FSO accountability and transparency points of if ESO is not delivering on that IT system and that IT system—of fundamental importance—is not capable of being amended and changed quickly because our needs are changing quickly, that should be a cause of real concern for the regulator and for Government because it will threaten net zero ambitions.

Q49 **Barry Gardiner:** If we are turning that into a recommendation from this Committee, are we recommending that the regulator does something in this area, trying to be as specific as possible?

Sarah Honan: That the open balancing platform is delivered at an accelerated pace and that it is adaptable to the changing needs of the system.

James Johnston: I would add that when we talk about digital systems, the fundamental word is "interoperability" because there are multiple systems here that need to talk to each other. The attitude historically has not been that of interoperability. That is fundamental.

Q50 **Barry Gardiner:** That takes me back into smart meters and the problems that we have experienced there. How could new tariffs, technologies and incentives enabled by smart meters more effectively encourage participation in demand-side response?

Jenny Russon: That is a good question. Time-of-use tariffs are likely to be one of the main financial incentives for consumers. However, we

would advocate for the development of new services, new business models and new ways to encourage consumers into demand flexibility.

Q51 **Barry Gardiner:** As a consumer, what does that feel like to me? Will somebody come along to me and say, "We can get your smart meter to turn on your washing machine at such and such a time or turn your fridge off at such and such a time"? How will it happen? We talk about this and anybody listening to this would think, "DNO, FSO—what the hell is all this?" Ultimately we are trying to make their lives easier, but it sounds like gobbledegook. What practically will it mean? How will this be delivered to somebody who does not want to know all the acronyms, who just wants to get it and in a timely fashion?

Jenny Russon: First, it is a choice because it is not your smart meter, it is the technologies that are smart. You would have to get a smart washing machine that would automatically respond to the market signals. Yes, it is a choice.

Q52 **Vicky Ford:** Do I need to buy a new washing machine, or can I just have a little widget that goes between my washing machine plug and the wall that gets a signal from my smart meter and says, "Electricity is cheap now, washing machine switch on"?

Sarah Honan: There are multiple different ways to do this.

Vicky Ford: Something cheap and easy so that when I run my house I can take advantage of being able to buy my electricity cheaply.

Barry Gardiner: Vicky and I are very simple people.

Vicky Ford: I just want my washing machine to be cheap.

Sarah Honan: This is why the regulations that are coming in are so good, because they will mandate that appliances will be smart when you buy them, so that you are not all of a sudden going, "Oh God, my appliance can't—"

Vicky Ford: My constituents cannot afford to go and buy a new washing machine or a new freezer.

Sarah Honan: This is long term.

Q53 **Vicky Ford:** How do we retrofit it?

Sarah Honan: Retrofitting can be done through things like smart sockets. It will not turn on and off your washing machine, as with EV chargers. They are smart by design and you have apps that do remotely talk to your appliances and tell them, "I want my house toasty by 7 am, my clothes washed by 7.30 am and my car charged by 8 am" and they do it for you.

James Johnston: The key point is that the transition will take 10 years plus. We can focus on the technologies that are able to do this now that

will not need or demand new customer behaviour. EVs are the key technology but electric heat technologies will also seamlessly have flexibility-first built in. When you are asking customers to change behaviour, that will come naturally over the course of the next 10 years. I don't think that we should be forcing that because you will get rejection and you will get a whole bunch of debate around it. There are lot of quick wins.

Q54 **Lloyd Russell-Moyle:** You are talking about storage facilities, where you store heat and you store electricity, but you are not talking about day-to-day use for washing machines and fridges at this stage?

James Johnston: At this stage we see the vast majority of transactions from residential level is from EVs, from electric heat and, to a small degree, from dedicated batteries.

Q55 **Chair:** Excellent, thanks for clearing that up. Time has got the better of us by quite a margin. A quick question. James, you mentioned transparency, sniff tests were mentioned and discriminatory practices and what have you. Is there something under the surface here that is a bit rotten in the energy market?

Sarah Honan: I don't think so. I think it is just it was built for a different time.

Chair: Thank you. We will take a break of a minute or two between panels.

Examination of witnesses

Witnesses: Dr Mary Gillie, Dan Stone and Mark Apsey.

Q56 **Chair:** Welcome back to the Energy Security and Net Zero Committee. We have our second panel this morning. I will ask them to introduce themselves from my left—name, rank and serial number, as I often say.

Mark Apsey: I am the managing director for a US-listed energy services company called Ameresco here in the UK, and also managing director for a joint venture with Bristol City Council, known as Bristol City Leap.

Dr Gillie: I am a founder of Energy Local, which is developing a number of local energy markets across the country.

Dan Stone: I am senior planner for net zero and I work at the Centre for Sustainable Energy, which is a charity supporting people and organisations to tackle the climate emergency and fuel poverty.

Q57 **Chair:** Welcome, and thank you for your patience this morning. How could the decentralisation of electricity generation and demand increase the flexibility of the grid and support the net zero transmission?

Dr Gillie: If we are to get to net zero, we have to have an awful lot more renewables. We can't build that all at transmission level because we physically can't get it down the wires. That ship has sailed. We cannot

rebuild the whole of our network. Therefore we have to have distributed sources located close to when we are using that power. As inevitably, unfortunately, now we will see the signs of climate change, we need a more resilient network. That means to a certain extent we need to be able to provide power locally. Our network cannot do that at the moment, it is not designed to do that, but the more local generation we have, the more potential we have for redesigning our networks so that we can run cells.

Q58 **Chair:** Is it a physical redesign as opposed to an organisational redesign?

Dr Gillie: Yes. The two go together though. Something that I bang on about the whole time is that we have to have a market that facilitates what we need on a physical basis. We cannot argue with the laws of physics, so it has to be that way around.

Q59 **Chair:** How could small-scale generation help to ease constraints on the transmission and distribution networks? I imagine that will not need the big lines to carry big volumes.

Dr Gillie: That is right. It does reduce the amount that we use the transmission network, but only if we then balance that so that our local load is using that local generation. Otherwise you are just creating the problem in the opposite direction. Likewise, at a local level, we need to be balancing local load and generation.

Q60 **Chair:** Would that not be more challenging if there are 200,000 houses with solar panels?

Dr Gillie: If I can give you an example of what we are doing, we have schemes where if local people have smart meters and measure every half hour, if they use that power—it might be solar on the school, it might be local hydro—when it is being generated, they agree the local price for that power. The generator gets a bit more; they pay a bit less. Mrs Moggs does not know that what she is doing is local balancing, she just wants to use that local power, support the power panels on the school or the local hydro, maybe community action or whatever, but that is what she is doing. Coming back to what you were saying earlier about community action and learning locally, this is how we create that, by operating those cells. However, to do that, those cells have to be able to participate collectively within the national market.

Q61 **Chair:** If there is a need to facilitate local renewable energy projects to sell directly to local people, does that need a push?

Dr Gillie: That is what we are doing. We call it a local energy market. It is not Mrs Moggs selling to Mr Jones next door. It is still facilitated by national organisations, but it is almost as if everyone is sitting behind one meter, as it were. Not literally, obviously.

Q62 **Chair:** Mrs Moggs and Mr Jones do not need to be active players in that?

Dr Gillie: Exactly. People have lives.

Chair: You have anticipated where I was going.

Dr Gillie: Yes, this is why we are trying to make it as simple as possible, building it in. As you said, people do not want to know about capacity markets and all the rest of it. We are giving them one signal of when the best time to use local power is, but also building in the needs of the national market and big wind farms or whatever as well. It is one bill and one signal for them to make it easy for them.

Q63 **Lloyd Russell-Moyle:** Are you saying that we need more nodal pricing?

Dr Gillie: No, not nodal pricing. It is still on a national basis. There are almost two prices. There is the national price that you offer for what is called extra power that is not generated locally, then you agree that local price. In effect, obviously that rewards using local power, but nodal pricing is something that gets incredibly complicated.

Q64 **Lloyd Russell-Moyle:** How do we ensure that what you don't get is the wealthiest communities that have been able to afford to invest in solar panels all over their houses then get very cheap energy and our poorest communities in—have I stolen that question? Sorry, I will keep going.

Dr Gillie: It is something that we are very mindful of. We have been working with Repowering in Brixton in London. There we make sure that we work with people. Often people who are most vulnerable cannot take the risks of something new unless they are absolutely sure that it will work for them. They start with a process of just monitoring their power and making sure that they understand it and we are handholding them through the process. Sometimes it is maybe too complicated for them, but we uncover a whole lot of other problems that we can solve along the way. It is a multi-pronged approach and that is very important so that we do take everybody with us. We are trying now to develop a process where we are developing communal heat as well, so that we can include heat with rent as a way of helping some of the poorest people through that mechanism.

Lloyd Russell-Moyle: There is more to dig at there but Barry will come on to it later.

Q65 **Vicky Ford:** Mary, carrying on from this, lots of local communities have lost their power due to storms in the past couple of weeks. Are you saying, "Let's take a rural community and let's have solar panels on the school, a wind farm and they can all effectively be self-sustaining businesses, homes" and so on?

Dr Gillie: At present we cannot do that. That is not how our network is set up and there are very good reasons for it.

Q66 **Vicky Ford:** Is that your vision?

Dr Gillie: We are certainly putting the building blocks in place. Some places in the north of Scotland now, NoSFES, at least in the short term are looking some of the most vulnerable and remote areas on this basis.

That is the vision, but we are at least putting the building blocks in place. There is a lot more to do.

Q67 **Vicky Ford:** Do you see that community being part of a flexible market as a single entity?

Dr Gillie: Yes, very much so. Mrs Moggs might not think of it quite like that.

Q68 **Vicky Ford:** What is the advantage to her?

Dr Gillie: As I say, she will want to use the power on the local school to support the school and get a lower price of her power. She will be focused on her community, but she will be benefiting both her and reducing costs across the board as well.

Q69 **Vicky Ford:** Assuming that that community is connected to the grid as well but working as part of a flexibility provider as a single entity, what is the benefit for me of working with all my neighbours in my community?

Dr Gillie: You get lower costs, but you also retain more of that income within your community. If more of that money is being passed to your local solar on the school or the hydro or whatever, you are benefiting your local economy as well, rather than all of that money going out of the community, being sold to a national supplier.

Q70 **Vicky Ford:** Should the local renewable energy project be able to sell directly to the local people?

Dr Gillie: That is effectively what they are doing. When people locally use that power half hour by half hour, they get a better price for it.

Q71 **Vicky Ford:** Which countries do this?

Dr Gillie: We have eight projects in the UK now.

Q72 **Barry Gardiner:** Following up on my colleague's earlier expostulation, how great is the risk that the benefits of consumer demand-side response are inequitably shared? Mark, can I come to you from your experience in Bristol?

Mark Apsey: Yes, I am happy to talk about that. The premise of your question is: do we need more decentralised energy? We do, absolutely. We need lots of renewable energy, whether it is offshore wind or localised. The benefits locally speak to resilience but also local tariffs that can then benefit local people. It is true that in Bristol—or wherever you go—we need to install infrastructure. I come at this very much from an engineering perspective of how we get this technology implemented in houses or in buildings or on a utility scale as well as from a battery energy storage flexibility perspective. To do that, what we need is different schemes for different people. From a technology point of view, the technologies are the same. We can put solar on a roof, we can put batteries into a building and we can add heat pumps and we have heard

about some of the market mechanisms that can enable that. However, we have to physically get those things in.

Depending on the consumer, we need to find ways to help them. In Bristol we are helping to deliver some of the home upgrade grant scheme funding work for certain qualifying properties in Bristol that can apply. Then we go in and do the whole home in terms of putting solar on the roof, installing heat pumps, improving insulation and doing that for them from grant funding, which is very welcome. Essentially that will reduce the bills. However, if they have the infrastructure and these markets come along that we have heard about, those families and properties will be able to participate in that market.

Q73 **Barry Gardiner:** The mitigation that you are offering is in terms of grants to provide those upgrades, isn't it?

Mark Apsey: Yes. It is very much a political question about how we help everyone to do it equitably. From our perspective, the technologies are the same. We have to install them, and we have to find ways to put them everywhere to enable resilience and the participation in the market.

Q74 **Barry Gardiner:** Dan, you have had this Smart and Fair programme. Can you tell us a bit about the fair side of Smart and Fair?

Dan Stone: Our view is that a flexible smart energy system has to be both smart and fair and if it is not both of those things, it will ultimately be rejected. There is a significant risk of a two-tier energy system. I have a friend who has a passive house with an EV in the driveway, solar panels on the roof and battery storage. There are all sorts of products served up to him. Contrast that with somebody in a rented flat where they do not even own the walls and you can see the disparities.

Therefore Smart and Fair is basically a capability lens looking at the capabilities and characteristics that consumers need to not be left behind. We set out a number of recommendations about that. However, overall what we are saying is that fairness will not reliably emerge from the market without deliberate and purposeful action by policymakers and regulators to secure it.

Q75 **Barry Gardiner:** You are restating my question back to me. I want the solution and I want to know what this Committee should be recommending. More particularly, I want to pick up on what you said about the rented market. What solutions can there be for the rented market, where the owner of the property is not necessarily going to benefit from the upgrades to the property that are required? Specific solutions, please.

Dan Stone: In the earlier section there was lots of discussion about simple technology like plugs that you stick in the wall, where you do not have to interact with it and you do not have to flex your life in order to flex your energy use. We need all of that sort of stuff. In terms of policy setting, first we need a commitment to assessing and understanding the

distributional impacts of the changing system. We need to scale up the provision of smart energy advice so that consumers know what they can do and how they can benefit and engage.

Ofgem needs to require that providers design services inclusively with regard to the needs and limitations of those customers. We need to provide a framework for street and community-scale demand-side response so that communities can develop community-scale flexibility projects that would include more people who would otherwise not be able to enter into the market.

Q76 **Barry Gardiner:** You have given me three things. First is research into who will be worst affected and need the most upgrading. Secondly is the advice and thirdly is the community-scale flexibility. From a policy perspective, how can we get those private rented sector tenants to engage in those community facilities, given that they do not own their property?

Dr Gillie: Can I make a proposal there? First—and this might seem slightly cockeyed—one of the most important things is to mandate licensed suppliers to support local energy markets. They are still doing the billing. They are the ones that take the credit risk and all the rest of it. However, if they then facilitate those local energy markets, it puts power behind those local people who can work in their community, who know their community, who know the people there, who can then go out and work with local people in those rented properties.

There are two things there. First, if you have a local energy market, even if your landlord is not playing ball, if there is local hydro or other people's solar, you can still participate as long as you have a smart meter. Secondly, particularly when there are grants available, to mandate that the landlord has to accept those upgrades, even if they are not going to benefit and the tenant is.

Q77 **Barry Gardiner:** There are two mandates there, one to the supplier—which you are recommending that we should recommend?

Dr Gillie: Yes, it is slightly redeveloping the role of a supplier rather than just flogging kilowatt-hours.

Q78 **Barry Gardiner:** You said to support local energy markets. When you say "support", what are you asking?

Dr Gillie: For example, in the projects that we have, they still provide all the billing and they provide the process wherein a net amount of export or import—when you have used as much locally—goes into a national settlement market. There are various processes for that to be done. Those are the two main things. It is billing and customer service that they still provide and the interaction with the national market.

Q79 **Barry Gardiner:** Therefore it is the administration and the backroom technical services that you say the suppliers should provide. The benefit

that they get from that is that they are able to sell less of their electricity to the consumer?

Dr Gillie: There is a number of benefits.

Barry Gardiner: That is what I want you to articulate, thank you.

Dr Gillie: We see from a supplier that generally that they just sell to us on a kilowatt-hour basis. It is a single price normally, with a few changes. However, when they are buying power, the power that they have to buy varies throughout the day. They buy some in advance at a fixed price but then they have to match it exactly. The risk of having not had enough power or too much at 4 pm to 8 pm—

Barry Gardiner: You are mitigating their risk.

Dr Gillie: Yes, you are mitigating their risk. They can understand what their customers are doing. Particularly with something like solar, you do not get this spill into the national market on a summer's day, when the price can go negative. It is a different way of thinking for the supplier, so it is quite revolutionary.

Barry Gardiner: Mark and Dan are champing at the bit.

Mark Apsey: I would like to come in on that. One of the barriers to getting some of this technology deployed is the planning stuff. The point that Mary is making there is that if there is a localised settlement in terms of being able to buy power from a locally generated onshore wind farm or solar farm that you can physically see and you are benefiting from that locally, you are more likely to support it in the first place, which means that we can build it, which is the problem. If we cannot build things, we will not have this capacity in the first place.

Dr Gillie: Absolutely.

Dan Stone: I agree utterly. We have been doing this future energy landscape work, which is engaging with local communities about how you can decarbonise your corner of the energy system. That is exactly what we see. Who owns the wind turbine spinning on your hill or the solar farm glinting at the edge of your town makes a real difference to how you feel about it. Therefore the planning system needs to first have a definition for what community energy is and means and be able to differentiate between commercial—

Barry Gardiner: I don't want to move on to that because I will be invading somebody else's territory.

Q80 **Mark Garnier:** My apologies for not being here at the beginning of this session. Dr Gillie, can I address my question to you? Others can leap in if you feel it necessary. The Government have had a lot of pressure to bring around a centralised grid to make sure that everything connects up with each other. Does that obsession with a centralised grid overlook the

opportunity for communities to become more energy self-sufficient? Not only that, does it get it in the way of communities becoming self-sufficient?

Dr Gillie: No. We have a brilliant national infrastructure and there are good reasons for that. It gives us huge resilience. It is the way that we use that that needs to change. Originally it was designed for large power stations and all the power going in one direction. We have to change how we use it now for different technologies and a different world. However, we still need to maintain that centralised physical network and national market. I liken it to developing cells. Each community is like a cell. It operates within itself to what is cost effective in providing as much power as possible itself. It will not provide all of it. Next door will be another cell and next door will be another cell and maybe in the centre of town where there are shops will be a different one. They can interact within each other but then they are all part of a cell within a cell as you go up the network. That is a physical structure, and we can support that with local markets within each cell with a national market on top of it. Then the two parallel each other.

Q81 **Mark Garnier:** Do you always need that topping up?

Dr Gillie: Yes.

Mark Garnier: We have not reached the stage where a small community could be producing more electricity?

Dr Gillie: It would not be cost-effective either. It gets to a point where it is not cost-effective to do that. You can see on small island communities how much more they end up spending just to keep their network stable and all the rest of it. There is a good reason why we built a national infrastructure.

Q82 **Mark Garnier:** How big are the cells that you are talking about?

Dr Gillie: That is a $1 million question at the moment because we have not worked that one out yet. Most of the generation that we are looking at is in the 100 kW to 500 kW. That is not to say that it could be under a primary substation. That is probably a small village scale. That is a TBC, to be worked out. We are still trying to work that out on the network and it is very early days to work out exactly what the technical solution would be.

Q83 **Mark Garnier:** To what extent is each cell predictable? Obviously wind and solar are entirely weather dependent. With hydro, I have the River Severn running through the middle of my constituency and a lot of people are suggesting putting turbines in the river to pick that up. That to a certain extent could be flood dependent, but there is always water coming through. At the end of the day, dispatchability of power and availability of power is everything. If you do not have that power when you need it, you obviously have a problem. Is that the problem with the local grids, that you need that to top it up?

Dr Gillie: To a certain extent. You can use batteries. One of the things about a local market is that you can potentially put the battery somewhere else rather than behind somebody's meters in someone's house, which is not the best place for a network in terms of controlling voltage and so on, and some houses are tiny anyway. If you can put it just within your market, maybe one bigger battery, that is potentially more effective. We want to try to match up hydro and solar, wind and solar, because they are mutually beneficial. Anaerobic digestion is wonderful, working on biogas, because that can go flat out. Therefore there is a certain amount of mitigation.

We are also looking now at how we can work on a community basis with community heat as well, running a communal heat pump and EVs. We try to use as much of that power as flexibly as possible. However, there comes a point, which is why we still need wind farms and tidal power and so on as well and we need to interact with the rest of Europe.

Q84 **Mark Garnier:** Do these weather-dependent generation schemes require ultimately to have the resilience elsewhere—the baseload power to be able to top it up in the middle of the night?

Dr Gillie: This is where storage comes in.

Dan Stone: The narratives of self-sufficiency and resilience and of individual communities meeting more of their energy needs from local renewables is hugely powerful in all the communities that we have engaged with—12 or 13. Those narratives come through every single time and people are making the specific link between more renewable energy generation and energy security and saving money, so those are hugely powerful narratives.

Q85 **Mark Garnier:** How much energy is lost in the grid? Is there a massive energy advantage by having a shorter delivery network?

Dr Gillie: Overall from transmission down, it is about 10% or 12% in total. Do not quote me on that, but it is something in that region. It is not massive.

Mark Garnier: It used to be a lot worse, didn't it?

Dr Gillie: It has improved, yes. If you compare it to converting gas to electricity, then taking it down the network and then reconverting it again at the other end, you can see how much power you are using there, which is one beauty of renewable generation.

Q86 **Mark Garnier:** One last question: how could encouraging community ownership models and more direct benefits from local energy projects help to deliver the scale of infrastructure expansion which will deliver net zero or is that too ambitious?

Dr Gillie: What I find interesting is that people start thinking that this is something that they can engage with and something that they can

understand. Then they start getting interested about the infrastructure and how they can help. They start understanding it and why we are asking them to do particular things. I have seen teenagers get involved in STEM subjects because it is real for them. Therefore it engenders that understanding. I always say that if you treat people like numpties, they will behave like numpties. If you treat them like sensible people, you at least have a reasonable chance that they will behave like sensible people.

Dan Stone: I would like to enlarge on that point. In the workshops that we have been doing, you get people in and talk about their landscape, which bits of it are sacrosanct that they do not want developed, and then serve up a menu of what they could feasibly do around them in terms of onshore wind and solar and the rest of it. Then they choose to what degree their community could be self-sufficient for their renewables. Eleven times out of 13 so far, those communities have identified support for enough renewables, including onshore wind and solar, to be totally self-sufficient.

Mark Garnier: That is interesting. All of us, as Members of Parliament, have planning issues that come up, with the potential for a solar farm and great arguments about productive farmland being given over to productive electricity.

Chair: There is never a loud debate over golf courses.

Q87 **Mark Garnier:** "Nimbyism" is the wrong word for it, because people protecting their local environment is a good thing, I think. However, at what point is it the brutal reality of, "I want enough electricity to keep my swimming pool heated, my jacuzzi and sauna working, my games room and all that sort of thing, but I don't want to see where it comes from"? It sounds like you have a debate with people and—

Chair: It sounds like a nice visit, going around to Mr Garnier's.

Dan Stone: You will have those debates at some point in the process. All we are doing is moving them upstream. We are asking, "To what degree could you become more self-sufficient?" It is an open question with a blank sheet of paper. You are building people's energy literacy hugely, so you are moving from a position of somebody who has a view that they do not like wind turbines—"wind turbines mince bats"—to somebody who understands that they kill bats in these conditions and this is how you assess it and that is how that process works. You are getting to a nuanced consensus among local people as to what might be acceptable around them and how they might benefit. Just by doing that, you bring people with you and you change the nature of that debate.

Mark Garnier: Yes, you engage them.

Q88 **Barry Gardiner:** A yes or no question: should this Committee recommend to Government that they create community energy champions to go into communities and precisely generate the community

schemes that you are talking about? It does need a catalyst, doesn't it?

Mark Apsey: Yes, you are right: it does need a catalyst and there does need to be good community engagement. We have all been testifying to that and agreeing on that. That is one of the things that we have seen happen down in Bristol, where there is very strong community engagement to decarbonise the city. One of the advantages of the Bristol City Leap programme is that it is very place-based. What we are talking about here are place-based solutions for decentralised energy and flexibility in people's backyards, in the towns and cities where people live. The advantage of the Bristol City Leap model is that it is a 20-year partnership between the city of Bristol and the partner to go in and think about the whole energy system in the city to give us time to work out where are the constraints, where we can put flexibility and batteries, either in people's homes or more generally on the grid, and where we can connect in the solar and the wind and get things going.

Because we are there for a long time, we can do things. We have just launched a community energy fund to help communities to do that first stage of feasibility into creating projects. For example, there is a great community project in Bristol, the Lawrence Weston turbine. It is a 5 MW onshore turbine that is community led. What we are able to do now as part of the Bristol City Leap is to sponsor a lot more things, grants and loans to do that first stage to get them off the ground and get them moving. Where you have community engagement, you can move the hardware deployment—which is where I am coming at—much faster so that we can participate.

Barry Gardiner: That is the longest "yes" anybody has ever given. It was extremely helpful. *[Laughter.]*

Dr Gillie: It depends what you mean by "mandate". There needs to be some sort of funding mechanism, but the idea of somebody coming in from outside and saying, "I'm going to be your energy champion," will not work. It needs to come from the community up. It needs to be somebody there, not somebody coming in from outside.

Q89 **Barry Gardiner:** It is not an imposition. Precisely the point is to have community energy champions, but we need to create those roles. Of course it would be a local person to inhabit that role, but unless we create those roles—

Dr Gillie: I am not quite sure how it would be funded, but there would need to be some sort of funding mechanism for that. One thing that we have gone back on, coming to the vulnerable, is that registered social landlords have been squeezed and squeezed and squeezed. The energy wardens and the tenant liaison people have gone or they have tried to amalgamate so that they are going across the whole of south London, therefore we have gone backwards to a certain extent. Particularly for the most vulnerable we have to bring them from the grassroots and make sure that they have those roles.

Dan Stone: I am dying to get in. Basically you have to ask what the conditions are that allowed the wind turbine in Avonmouth to happen. It took seven years from inception for it to be spinning. That is much too long. Bristol got funding from all over the place, scratched from all sorts of different sources. It had a very supportive city council that helped with land acquisition, which it might not have had in another place. There is the Bristol Energy Network, which is an umbrella body of community energy groups, all supporting one another, with access to solicitors and different experts. All of that infrastructure is missing and absent in different parts of the country. Could you replicate that case study somewhere else easily? No, not really. It would be very difficult at the moment.

You have to make the community energy fund that is just about to open permanent and scale it up and then go back to a statutory definition for what community energy is and allow the planning system to treat it differently, get local authorities to convene a debate about community energy. I could go on.

Barry Gardiner: Sorry, I did ask a short question, Chair.

Q90 **Chair:** I was doing that very thing yesterday, speaking to my local energy champion, Carolyn MacPhee, in the Hebrides. It is happening in some places and it is a vital role that people have to play in the community, who come in at a different level and are seen not to be representing companies or even politics or even Governments, but who are working in the local authorities doing that sort of thing. Mark Apsey, from the conversation that I had with Carolyn MacPhee yesterday, can you make a case for why the Government should provide greater support for the introduction of microgrids and other local grid solutions?

Mark Apsey: We have not mentioned the term "microgrid" but that is fundamentally what we have been talking about in terms of decentralised resilience grids. Part of it is just to enable decentralised energy to get set up and deployed in certain places. You do microgrids for different reasons in different places; it depends very much on the use case. We see historically in our company based in the US there are some strong cases for resiliency and microgrids in navy bases, for example, in the US military, because those are mission-critical things that have to keep running all of the time. You can have this islanded solution with a microgrid and the technologies are there to say that we will put down some solar, put in some batteries, put in some back-up generation and have some very smart switching systems to turn off non-critical things to keep those things going.

In a local community context, it is slightly different, and in the UK we do have the luxury of a very resilient grid in general. However, we need to decarbonise it and use all of the land assets that we have, whether that is rooftops everywhere or fields that are not being used for farming and that it is sensible to change the use case for to generate as much as possible as quickly as possible. In the local context, that is something

that we could accelerate along the path to net zero. The case for doing it is not the same case on a military base where it is mission-critical resilience stuff and you need to be able to island if the grid goes down, but you do want local resiliencies when shocks hit the system over time.

Q91 **Chair:** Mr Russell-Moyle and Mr Garnier mentioned—and mentioned well—the difficulties that people have with an energy inequality, and people living cheek by jowl, potentially. You have some people who can invest in solar goods and make cheaper energy in their locality because they might be in a leafier suburb, as they put it in the south of England. However, in the north of Scotland you have an area where you have a lot of energy. We are not quite Iceland with energy, but we have plenty of energy and we are exporting energy all the time. We have a situation where people are a lot poorer than the UK average, with incomes a lot less than the UK average.

There is plenty of energy going around, but the frustration that people have and people like Carolyn MacPhee are trying to get around—trying to get around Ofgem and whatever it is—quite a lot of this energy is wasted anyway. I am thinking of the island of Lewis, which is the third largest of the of the British Isles after the island of Britain and island of Ireland, there is big production going on but local people cannot really benefit from that because there are distribution penalties and transmission penalties, relative to the UK averages. Shouldn't there be a way of removing some of those difficulties and inequalities that people are coming across and, secondly, benefit from the energy that has been essentially wasted because of the rate payments?

Dr Gillie: Yes, definitely. This is what we are trying to get at with local energy markets so you get a cheaper price for using your power locally. We are working with the DNOs to look at how that can potentially also manage constraints on the network. It will not manage all constraints by any means, but certain constraints. If you can say, "Right, I can use this power locally," then potentially you can connect more or keep it running so it is not curtailed as much. Certainly that gives people a real benefit. Because, as you say, it is one of those sorts of horrible ironies that you can have oodles of power and people in fuel of poverty right next to it. Yes, that is something we will tackle.

The other thing, as I touched on before, is that I never quite know what a microgrid is. It depends on who you ask, if I am honest. But this idea of using batteries to help increase resilience, particularly on the islands and in remote areas as well—it was obviously the first place to try it out. First of all, they are looking at, "Okay, can we just keep that bit of network going for maybe a few hours while we fix the problem or we get a diesel generator up there?" Obviously that can then be extended, but we do have a good national network, which we built for a reason.

Q92 **Chair:** There was an engineer who told me he was in a power station at Loch Carnan in South Uist. He said most of the time the energy that is being consumed is the energy that is being generated. However, it is

being treated like the energy that is being consumed has been imported and the energy being generated has been exported. They are both penalised. To an extent that will have some of the physics things and whatever, but to a large extent it seems like it is a bureaucratic treatment of the inaccuracies that have been made.

Dr Gillie: Well, it is and it is not. I liken it to this: I don't use the M6 very often, but I do like it to be there, so obviously I should make a contribution to its upkeep. The idea that just because you are using the power on your island you shouldn't be paying for the upkeep of the whole network at all would be very analogous. But yes, you should be rewarded for using that power because that will reduce the cost for everybody.

Q93 **Chair:** Isn't that what we are talking about in the leafy suburbs as well, that if they start having the solar panels on the roof that there should be a reward for that?

Dr Gillie: Yes. As I say, that will reduce the cost for everybody in terms of managing the transmission network and so on, but we do have to make sure that the most vulnerable can benefit as well.

Q94 **Chair:** I don't know if there would be local areas of advantage. Lloyd Russell-Moyle's point was that some places might have the wherewithal through perhaps disposable income or perhaps a desire to have more solar generation and that they will see benefits that other areas, for whatever reason, did not.

Dr Gillie: Yes. This is where we need to make sure that we use things like ECO4 grants and so on very effectively so that we do make sure that everybody can benefit. One of the great things about local energy markets is you can tackle not only giving people a reduced cost, but giving them stability or a degree of stability in pricing as well.

Q95 **Lloyd Russell-Moyle:** If everyone has the benefit of the reduced pricing, you do not have reduced pricing, do you? You just have a slightly different price.

Dr Gillie: Okay. Maybe I should clarify that.

Lloyd Russell-Moyle: You have to have someone not benefit and so the question is: how do we make sure that those who are not benefiting are not the poorest? I have not quite yet heard an answer.

Dr Gillie: Maybe I should—

Lloyd Russell-Moyle: I get it is not an individual house, but the poorest community is the one that doesn't benefit the most. If you can tell me a way that the richest community still pays more and the poorest community pays less, then I am into it. If you cannot tell me that, then I think this is a bit of a scheme to make rich people pay less.

Dr Gillie: Maybe I should clarify. What I am first saying is it is not a zero-sum game, okay? Just saying, "Oh well, if I pay less, someone else

pays more," is not true because we are reducing the cost overall. But, fair dues, it is true—

Lloyd Russell-Moyle: They are still paying more.

Dr Gillie: Okay, so it is true that obviously if you are rewarding someone for doing the right thing, as it were, yes, they are getting more reward than someone who either cannot or is not. Now, I think there is an issue with the way that we charge for electricity on our standing charges as well. It needs to be a two-pronged attack. It is not a zero-sum game, so the cost for everybody will reduce, but also we need to make sure that things like standing charges, which are quite an unfair way of charging for a lot of the network charges, particularly when they are just a per meter charge, is a very unfair way of charging for a lot of those services. That is something that we need to change. It is not an issue for flexibility, that is another issue, but you are absolutely right, yes.

Q96 **Barry Gardiner:** Are you saying that you would hope that this Committee might recommend that we should have rising block tariffs, which then make sure that the people who use least energy pay least per unit for it and those who use more energy would be paying more per unit for it?

Dr Gillie: There are various ways of skinning the cat. You could put more of a cost in per kilowatt-hour rather than the standing charge, so if you use more kilowatt-hours—

Barry Gardiner: I agree with you on getting rid of the standing charge, but I am asking about the benefits of the rising block tariff.

Dr Gillie: I personally think that there maybe should be almost two rights—almost like this is what people need for a decent standard of living in terms of electricity and then over and above that. Something like that, yes—I do think there is an argument for that.

Dan Stone: Yes, I would agree.

Mark Apsey: I can absolutely see a case that that might work where you charge higher consumers more per kilowatt-hour for that extra consuming.

Q97 **Chair:** You have been involved with the Bristol Leap project for the local community and the benefits that might deliver and this is touching on the areas that we are on at the moment. What benefits will that give the local community versus other communities?

Mark Apsey: The whole idea about Bristol is we are going in to decarbonise the city and the city there has put its corporate estate up and said, "Look, if we can come out with projects that decarbonise on the estate then we can get on and do that." But what that means is we have landed in the city and therefore over a long period of time we are able to

commit to a significant amount of social value, which benefits the citizens of Bristol.

Over the first five years, we have committed to around £61 million-worth of equivalent social value. A lot of that is spend in the local community with local companies to deliver the sorts of interventions we have been talking about already, but there is more than that. We have talked about a community energy benefit fund, which we have put down as part of that. We have committed to creating over 1,000 jobs in the region as part of the initiative, as well as just decarbonising the energy system and doing a lot to help meet the objectives that the city has set itself in terms of decarbonising.

Q98 **Chair:** I think this is touching on what number of people have been moving to—microgrids, local networks and local grid solutions, how they interact with the bigger picture, as set by Ofgem, of the cross-country market or whatever. As Lloyd was touching on, it gets cheaper in some places, then more expensive in other places again. What is the vision here? Is it that if you are in an area where things happen then you will get cheaper energy or is that idea not the case, it is a case of versus the current or what it would have been and everybody is on lower?

Mark Apsey: An interesting question. In terms of—

Chair: I do not know if there is an answer at this stage.

Mark Apsey: We have heard some great ideas this morning about how a market mechanism could encourage greater flexibility and get deployment and how it can benefit local people who see that development done in that space. Those are very good things. As the market evolves and as the rules change, I think we will see more deployment.

From our perspective down in Bristol, it is about deploying a lot more of these things in the right places. Some of the constraints we see are whether we can even connect solar within the district network operator, the local system, because there is not the capacity to take renewables. Bristol is a very unique place because we have lots of land out in Avonmouth and all the demands in the city centre. To get the electrons in, there are still constraints at that district network operator level.

We need to think commercially and cleverly about how do we do that so we can build where the land is but then benefit the local community in the city through some of these interesting tariffs we have been talking about, or maybe commercial sleeving of the tariffs so that people pay less within Bristol for that power that comes from there, as well as contributing to the local network. What we have, and it is very exciting, is the opportunity to look at that whole energy system in its totality and play with it and think about new ideas that may work and trial some of these new emerging market mechanisms.

Dr Gillie: We have REMA and so on, the reform of the energy market. My two biggest pleas: one is that they are still thinking on the individual connection point, and they need to think about how a cell can potentially trade within the national market because that still does not seem to be on the agenda with Ofgem, which is a kind of real frustration for me. I think that could, in so many different ways, bring benefits in terms of managing volatility and so on.

Probably the other thing is to think about what we mean by "fair" because it seems to be an assumption that a flat fee is fair when it comes to a per meter charge, it is fair when it comes to transmission use of distribution.

Q99 **Chair:** Would it be better with a nodal or zonal type setting?

Dr Gillie: Yes, but per meter it is effectively a fixed charge per meter, which means that if you cannot afford much electricity, you are still paying the same fixed charge. The mentality behind that is if everybody pays the same, that is fair.

Chair: That is a standing charge?

Dr Gillie: That is a standing charge.

Chair: That is a poll tax on electricity.

Dr Gillie: Yes. It comes out in the standing charge, but basically it is a per meter charge for particular charges that you do not see as a consumer. I would say they need to think about what they mean by "fair" because I do not think that is fair. Then we can start thinking about, okay, how do we manage and spread the cost of accidents of history, of where we live, but also just how the electricity network was developed in the first place.

Q100 **Chair:** If you live in energy-rich Iceland, rather than use a thermostat they use the window to control the heat in the room, even in the winter, but energy-rich places in the north of Scotland, which is tied in with this UK system, aren't going to benefit, other than tinkering very much at the edges.

Dr Gillie: If they are using their local power, they need to be able to get a benefit from that. They need that whole infrastructure to get that power to the south of England for anybody to be able to build those wind turbines out at sea and so on. We need that infrastructure to make that possible.

Q101 **Chair:** Who should pay for that infrastructure?

Dr Gillie: That comes down to—

Chair: At the present, we get told that if you are in the north of Scotland, to sell into that market you should be paying for that infrastructure in your megawatt charges.

Dr Gillie: Yes, so at the moment—

Chair: Then if you are buying it, you should be paying for that infrastructure to get the stuff to you.

Dr Gillie: There is an interesting question there about whether the large generators should paid for effectively going to where the most renewables are. Is that the best way of charging? There is an argument that we should be building in places where there is spare capacity, but if there isn't the wind and the solar there, is that the best thing to do?

Q102 **Chair:** It is something like 16 times the cost to transmit energy within the UK from the north of Scotland to the south than to buy it in the European Union and take it into the UK.

Dr Gillie: There are distortions as a result and something that I have always argued with Ofgem is that it talks about technology neutral. That basically means gas favourable because a gas turbine can pick itself up and go wherever it wants when it comes to developing the network. I would argue in the future we can't take that attitude.

Chair: Even though we have a regulated market, we can argue we don't have a free market. We have spent a lot of time on this question but everybody keeps interrupting. Back to Lloyd Russell-Moyle.

Q103 **Lloyd Russell-Moyle:** It is interesting, when we put a gas power station somewhere we do not talk about having to bribe the local community by offering them cheaper energy. Everybody objects to a gas power station; nobody likes it. For some reason when we talk about wind and solar we talk about all the objections and needing to bribe the local community, rather than just enforce it on the community. Are we doing too much participation and it would be better just to say to communities, "You have to have it, it is not a choice. These are nationally directed decisions, and we are fed up with—" because people who are busy working hard, the working mum who doesn't have any time, doesn't want to engage further on her energy. She wants to turn her washing machine on at the time of her choosing—not on the time of some bureaucrat's choosing or some expert's choosing, her choosing—and get on with her life. Is there a case that we are asking for too much local participation and we should be having more national direction?

Mark Apsey: There are some interesting points in that question. We do need more national infrastructure to distribute the power from where it is generated to where it is being used and that is inevitably going to impact local communities. I mentioned planning is a problem. Planning capacity, just to move things through at the pace that we would expect planning to get approved, is a problem. I would be reticent to say you should absolutely impose things on the community. I think there is a real need for people to be able to speak up and talk about what is right for their areas. We have to be able to have a frank conversation about what we need to supply electricity and energy to those places as well.

Q104 **Lloyd Russell-Moyle:** At the moment there is no real clarity on the role of local and regional government in achieving that, apart from the planning process and voluntary action that you might see. Does there need to be more clarity?

Mark Apsey: There needs to be more capacity in planning. We are delivering some projects for National Highways right now, such battery energy storage at motorway service stations to enable rapid charging for EV where the grid is not able to do it when all of the electric vehicles turn up. Many of those sites have been delayed beyond the time when we would have expected a planning decision to let the projects go. We are talking 77 days, 90 days beyond when we would expect to hear. That is to do with local planning capacity. What we do need is more planners and a reform system to push the planning through quicker or at least on the timescales that people say they will come back on because that physically stops us deploying this infrastructure.

Q105 **Lloyd Russell-Moyle:** That costs more money.

Mark Apsey: Yes, but it costs more money to delay as well in terms of we want the infrastructure.

Dr Gillie: There does need to be a balance, you are absolutely right. People do tend to just focus on obviously what they can see. Sometimes I try to explain to people that there is a whole lot of infrastructure across the country that allows their turbine that they make money on, whatever, to function. We need all that and they need to think about the whole picture. There is probably quite a bit of education there.

In the past we just dumped coal-fired power stations on, let's face it, often quite the poorest parts of the country. I do not think we want to back to that situation, but I do think there needs to be sort of education and also a challenge, "If you do not want that wind farm, will you stop using so much power?" because people have to take responsibility. I think there is a need to challenge people as well.

Q106 **Lloyd Russell-Moyle:** Should there be a mandate or responsibility given to local government to ensure that that happens?

Dan Stone: I just wanted to come back on your question earlier. We have run that experiment already. Back in the days when we used to have regional spatial strategies, they used to have a target for kind of renewable energy generation, and we had wind projects particularly being pushed through on appeal. We had a very poisonous relationship between the wind industry and communities, which led to the wind ministerial statement, basically. We think we have, in terms of the decarbonisation, picked the easy fruit. It is now the difficult stuff and the stuff that will have landscape impact. Therefore you need to take communities with you, basically. When you do that, the public is behind us, but they need to have a say and they need to benefit.

I do agree that local authority should be taken to task much more seriously in terms of, "Do you have a positive strategy to maximise renewables?" There was one local plan near us where they were saying, "We don't have any capacity for wind in our whole county." That is not what the evidence says. It is just unbelievable, so when that local plan gets to examination in public that should be seriously questioned. If you are not going to do wind, what are you going to do to improve your contribution? What is your contribution to the energy system going to be?

Q107 **Lloyd Russell-Moyle:** At the moment, local plans are pushed to the lowest common denominator. In their local plan, everyone says, "We think we have worked out a formula that we can have less houses." No local plan says, "We can deliver more wind or more solar or more houses than the Government have told us that we need to." There does need to be a change there. You have talked about pricing but is there a role for the Government to support financially maybe, rather than it being a pricing mechanism, one-off payments to places, communities or even local government?

Dr Gillie: There are community benefit payments to large wind farms and so on. I would argue that potentially they could be used much more effectively to improve the low-carbon infrastructure of an area, just into a slush fund, as it were. There are mechanisms there. I do think we have to be wary. The people who have the time and who are anti that often wave their placards more than the people who think it is a good idea. We don't have a tendency in this country to wave placards saying, "Yes, yes, yes, this is brilliant." We always have to be careful as well of that element.

Lloyd Russell-Moyle: In some countries they have more directional—

Chair: Unless they are told by Mr Putin or somebody to go do that.

Q108 **Barry Gardiner:** Which was the local authority that you were referring to?

Dan Stone: I think they might remain nameless, but they are not the first.

Q109 **Lloyd Russell-Moyle:** The local plan is a public document?

Dan Stone: Yes, it is.

Lloyd Russell-Moyle: It would save me scouring through all the local planning documents.

Dan Stone: Okay, Wiltshire. It is not unusual though. Quite often you see planning policies that say, "We support renewable energy in principle," and then all you have is a long list of negative criteria, so essentially, "We support invisible renewable energy generation," which is totally not what we need. It goes back to national planning policy, which has not changed in respect of renewable energy, except to make onshore wind more difficult, for about last 10 to 15 years.

Q110 **Lloyd Russell-Moyle:** My experience of wind generation is that you have lots of hot air before it is built and once it is built everyone loves it. Nobody thinks they should be paying less money for the generation of it because it is in their community. There is an initial opposition, but the long-term opposition completely washes away. I think about single wind farm that we have locally, I think about the whole Rampion Offshore Wind Farm, single turbines that we have had locally onshore and offshore and the opposition always washes away after the initial NIMBYs are basically shown up.

Dan Stone: Public opinion on wind has totally changed. In those 12 or 13 consultations we have done, I have not had difficult conversations about onshore wind. Eleven of them—I think it is 11—have supported onshore wind.

Q111 **Lloyd Russell-Moyle:** It may be a case that we are making more of a rod for our own back, thinking that there is huge opposition, rather than just pushing forward. The last question to Mark: what should the Government do to encourage more developments like the Bristol City Leap?

Mark Apsey: Simply put, there are lots of cities who are keen to copy the Bristol model, which enables longer-term investment and job creation in a particular place and a sensible look at the local energy system. What would be very helpful would be to come up with a way of taking what Bristol has done, which is a concession agreement, standardising it, then making it available and supporting other cities to effectively dial in the things that are most important to them in terms of the amount of carbon to be saved, the amount of investment people want—it is an outcomes-based procurement—and then help run those procurements. When I speak to local authorities across the UK, they are very keen to find out what is going on in Bristol. They want to copy it but, frankly, they do not have the expertise and the money to run the procurement, to procure a partner to do that.

Q112 **Lloyd Russell-Moyle:** There needs to be like a standard smorgasbord that every council can go to—the framework set-up—and then they choose the bits from that that they need.

Mark Apsey: We would like to see the learnings from Bristol taken and standardised, and then other cities helped to roll that out rather than reinventing the wheel.

Dr Gillie: I do think there needs to be a real capacity building in local councils though. There is a lot of expertise that has been lost and that is a big barrier. Part of that is about giving them the capability to do it because then the great brains of Britain will come and work for them because there is something they can do there.

Q113 **Lloyd Russell-Moyle:** Should that be financed from the Department?

Dr Gillie: Yes, I think it should.

Q114 **Mark Garnier:** Dan, I will come back to you. Lloyd has covered an awful lot of the questions I was going to ask you already. You have dealt with a lot of the problems. What are the solutions? What specific policy intervention should be made by the Government on local planning in order to allow this to happen?

Dan Stone: First of all, I would remove the need to forward plan onshore wind, just get rid of that. Then we need to have legislation defining what community energy is and enabling local planning authorities to treat community energy projects, which win much more support than commercial projects, basically. We need to streamline planning and the consenting process for community energy projects to enable them to come forward. There are already requirements for local planning authorities to have positive strategies for renewable energy, but it is not enforced. The NPPF needs to be updated to reflect the full-throated climate impacts that we are seeing and the increased urgency of increasing renewables, then making the process of preparing renewable energy policies much easier.

What you have at the present is 300-plus local planning authorities all commissioning very similar renewable energy capacity studies and then creating their policies from those. That is a crazy use of resources. I speak as somebody in an organisation that gets paid to write lots of those. Can we not nationalise that process and at least look at national modelling of the scope for onshore wind, ground-mounted solar—rooftop PV is already done—and micro hydro? There is a 2010 study by the Environment Agency. Can we not basically update that biomass and so on and then publish that for local planning authorities and community energy groups and everybody to use to then form their policies from?

Q115 **Mark Garnier:** Essentially you are saying to centralise a lot of this?

Dan Stone: Yes, centralise that. I am not saying that you should be forcing local authorities to all have onshore wind or solar. They can set their policies, but they should definitely have the need to have proactive positive strategies and they should be questioned on that.

Mark Garnier: You end up with these inevitable problems. All of us, as MPs, have seen these problems. You can end up with this going to a planning committee and the planning committee are recommended to approve something. The planning committee do the political thing, they refuse it, and it then goes back and it goes through. Does planning work for the benefit of—sorry, this is a much more philosophical—

Chair: Are you saying get rid of the planning?

Mark Garnier: No, I am not saying get rid of it at all. I think it would be the end of my political career if I said that.

Q116 **Chair:** Were you saying to get rid of planning?

Dan Stone: No, I am not saying get rid of it; I am saying that you should get rid of the need to forward plan wind projects, you can just put

in a planning application for a gas-powered turbine. You can just put one in, or a solar farm, but for onshore wind it needs to be in the local plan or a neighbourhood plan and that makes no sense. I am a town planner. I am not saying get rid of planning. There needs to be community involvement and the democratic process still needs to be there.

Q117 **Mark Garnier:** Does this local democracy work? We have just done our local plan in Wyre Forest but at the end of the day you end up with these endless fights and they still come back. The bat surveys and God knows what else is driving us up the wall.

Dan Stone: What is that quote? "Local democratic process is the worst system of governance in the world except for every other." Who is that quote from? Yes, I am a town planner and I believe in the planning system as a way of—

Q118 **Chair:** Just briefly, what do you think of the Government's recent proposals for the communities who host this for the benefits they might get for the onshore wind development?

Dan Stone: They are very flawed. This is the partnerships for onshore wind, isn't it? What that is basically saying is that commercial development should put a bit more into community energy funds for local communities to benefit. That is fine, but that is a small proportion of what you could do. We are talking to communities every day who want to do community-owned projects or joint ownership projects. Can we not have more support for that so we can unleash the potential for communities to benefit in ways beyond getting a bung from a commercial developer?

Dr Gillie: I think, as I touched on earlier, there is potential for much better ways of using the community benefit. You could build your community heat network, you could retrofit all your homes or whatever, or you could integrate that into some of that power that is coming from your large wind farm or whatever. Then it is very physical, rather than—

Q119 **Mark Garnier:** On the community heat network thing, we see a lot of new houses being developed in the States. Are we at the stage where we could start mandating that if you are building a housing estate of 25 houses plus you introduce a community heat project?

Dr Gillie: I would certainly want to look at it. Off the cuff, I would not definitely want to go, "Yes, definitely for a policy," but it is something that we should definitely look at and something that—

Mark Garnier: Or alternatively incentivise it.

Dr Gillie: Certainly Denmark and so on I know have had to introduce things like that to kickstart heat networks. Yes, potentially. Although I have to say the majority of our problem will be decarbonising our existing housing stock.

Q120 **Chair:** Thank you very much. We have the Secretary of State in the

afternoon, which is the problem, otherwise many of us would be quite keen to keep going. I will just remark at the moment that wind at 12.05 pm was producing 41.6% of the UK's energy and the total renewables are at 53% and gas was 13%. We have talked about the utopia of energy production, but I am not sure that this is happening just now. I am not sure the consumers are seeing the price benefits. Are the CfD prices happening? Are they coming through to the consumer or is it just all being denominated in the 13.1% of gas? I am not particularly looking for an answer, I am just leaving that hanging there, but if somebody wants to fire out a short answer, they can.

Mark Garnier: It goes through the spot price.

Mark Apsey: It is interesting about carbon pricing on electricity versus gas, where we put that and whether that is a dynamic carbon pricing mechanism because we can settle kilowatt-hours. Every half hour we can look, as you just said, at the current intensity of electricity on the grid. I think there is a case and we could leave it hanging, but to think about the carbon pricing effect—

Q121 **Chair:** Are all these changes we are talking about going to make a difference to consumers? Given what we have right now, facing high energy costs moving forward—

Dr Gillie: Fundamentally our spot price is still dictated by the gas and that is what we have to get away from.

Chair: How much of the wind that is being produced is governed by CfDs? Another question for another day. Thank you all very much.

Barry Gardiner: One of the recommendations that this Committee might take up.

Mark Garnier: You have opened a massive Pandora's box there.

Chair: Indeed, and then I close it. Thank you all very much.