



HOUSE OF LORDS

Environment and Climate Change Committee

Uncorrected oral evidence: Electric vehicles

Wednesday 13 September 2023

10 am

Watch the meeting

Members present: Baroness Parminter (The Chair); Baroness Boycott; Baroness Bray of Coln; Lord Bruce of Bennachie; Lord Duncan of Springbank; Baroness Jones of Whitchurch; Lord Lilley; Lord Lucas; The Duke of Wellington; Lord Whitty; Baroness Young of Old Scone.

Evidence Session No. 2

Heard in Public

Questions 23 - 41

Witnesses

[I](#): Steve Gooding, Director, RAC Foundation; Melanie Shufflebotham, Co-founder and Chief Operating Officer, Zapmap; Jonathan Marshall, Senior Economist, Resolution Foundation; Ian Johnston, CEO, Osprey Charging, Chair of ChargeUK; Dr Russell Fowler, Senior Project Manager, Decarbonisation of Transport, National Grid.

Examination of witnesses

Steve Gooding, Melanie Shufflebotham, Jonathan Marshall, Ian Johnston and Dr Russell Fowler.

Q23 The Chair: Good morning and welcome to the second evidence session of our Select Committee inquiry into electric vehicles. We are delighted to have five expert witnesses before us today. We have Steve Gooding, the director of the RAC Foundation; Melanie Shufflebotham—I hope that I have pronounced that correctly—the co-founder and chief operating officer at Zapmap; Jonathan Marshall, the senior economist at the Resolution Foundation; Ian Johnston, the CEO of Osprey Charging and the chair of ChargeUK; and Dr Russell Fowler, the senior manager decarbonisation of transport at National Grid. You are all extremely welcome and we are all pleased to see you. We are expecting perhaps one other member of our committee, who will be joining us online, so there may be some questions coming down the line in due course.

To open up the discussion in a broad way, can I ask you about the Government's 2030 and 2035 phase-out dates for EVs? In your opinion, are those realistic and achievable? What do you see as the main obstacles to achieving them?

Melanie Shufflebotham: Good morning. It is nice to be here. At a very high level, yes, I think they are achievable and we should be moving forward on that basis. There are certainly challenges along the way. To frame where we are at the moment, 2.5% of all cars are pure electric and 4% are electric or plug-in hybrid. Most forecasts show that, by 2030, when we get to 100% new electric or plug-in vehicles there will be 10 million cars on the road, which is 30% of all cars. There will still be 70% petrol or diesel cars there, so we are going from 4% to 30%.

There is a challenge. The key challenges are, first, on the charging infrastructure, which is my expert area. I see that as rolling out at pace, but obviously we need to continue to roll that out both for the en route and to support people who do not have off-street parking.

On the supply side, I would like to see more electric vehicles that are smaller and at a cheaper price. I would like to see the price come down and fair pricing on petrol for people who are not able to charge at home; for example, by equalising the VAT rate.

On the demand side, there is lots of demand out there, but we need better and clearer information. A lot of those measures within the charge point regulations are very valid, and we can probably discuss them later.

Steve Gooding: You have heard from Mike Hawes from the Society of Motor Manufacturers and Traders, and he has expressed confidence. The auto industry is telling us that the dates are achievable, and I have no reason to disagree with them.

The risk that comes with those dates, though, is that if, say, there is a constraint on the availability of new vehicles and if that is not meeting

the market demand, or if, as we saw predating the move to electric, people are keeping cars going for longer, so the age of the vehicles in the fleet is getting older, we could see people using their older internal combustion engine vehicles for longer. So the risk is not so much one of the market not being able to meet the target. If the Government say that you cannot sell internal combustion engine cars, is that achievable? Yes, because they can make the laws and that is that. It is the consequence of that, and if that means more of us driving more internal combustion engine miles, that is a problem for achieving the climate objective.

Jonathan Marshall: We do not see any issue with the Government's phase-out dates. There is potential concern about the way the dates are feeding through into the market. At the moment, electric vehicle sales are being driven by those at the top end of the vehicle range. It is people with large amounts of disposable money buying expensive cars, which means that the flow of these electric vehicles through the vehicle stock when they enter the second-hand market will be expensive, large, costly to run vehicles, which would pose barriers to those on lower incomes from participating in the second-hand market.

Secondary to the top-line phase-out dates there is a vehicles mandate, which should, as it gets tighter, see more manufacturers selling more electric vehicles, so that it is not just Teslas and large Mercedes cars that are being sold but the more everyday family car that will become more available to households on lower incomes. As yet, the mandates are just getting going and the targets are still quite low, so again it will be a while until this stock feeds through into the vehicle stock.

A second issue is that vehicle sales at the moment are driven largely through leasing and hire purchase. There is not much understanding yet of what that will mean when higher interest rates feed through into these deals and cars become more expensive to run on an annual purchase cost. How that will impact consumer behaviour and the types of cars that people buy, and whether people will buy cheaper cars or non-electric cars or not buy new cars, is all to be seen.

The final main issue to flag at the start is the charging network. There are clear trends in who can charge at home and who has protection from the volatility of fuel markets or some protection through the price cap and who does not. There are clear trends by income, by rural and urban environments, by tenure, by age. All these will need to be dealt with so that there is fair access to fairly priced fuel for everybody.

Ian Johnston: We agree with the panel and with the automotive industry that the phase-out dates are realistic and achievable. We also feel that they are essential. Already in 2023, we are seeing that 40% of all new sales are battery electric vehicles, and that is with six years to go until the phase-out date.

We now have this thriving, emerging public charging industry. We now have 48,000 public chargers across the UK. That is a rate of growth of 40% in the last 12 months alone, so there is a real bonanza of

deployment of infrastructure happening today. Our members have committed over £6 billion to invest in more charging infrastructure in the UK, and any weakening or hesitance on that strong stance will have a significant detrimental impact on the conviction of investors into the UK to build the infrastructure we all want to see for the phase-out dates.

The Chair: Thank you. That is very clear.

Dr Russell Fowler: Thank you, Committee, for inviting me here today. I am from National Grid. I shall clarify which parts of National Grid I am from, as it is a large organisation. I am representing our transmission business, which owns the high-voltage electricity system in England and Wales as well as our distribution business, formerly Western Power Distribution, which owns the distribution networks, so the lower voltage network in the south-west of England, south Wales, east and west Midlands.

I agree with the panel that the target certainly helped to focus the industry on that target and behind a single goal. They are stretching targets, but we fully support this ambition as National Grid. As my colleagues here have said, it is important that there is certainty behind them and collaboration between the various industry players here. You need lots of people to be able to deliver this—from the OEMs, the charge point operators, and us at grid. Having clarity on that end date, and on the milestones that you need to be able to hit that end date, is important. The end date is a great start, but the milestones to hit that and the strategies and policies to deliver them are equally important.

Q24 **Baroness Boycott:** I have a quick question for Steve Gooding. I drive a small Peugeot. It is five years old. It is a petrol car. Right at the beginning of this inquiry, I asked—I cannot remember who—what the best thing was from an environmental point of view: to keep driving my car until it is in the ground, so to speak, or to sell it and buy a second-hand or new electric car. The answer was that it was best to hang on to the car and just keep going. You made the point that there would be something adverse—I think that was what you were saying—in people hanging on to their cars, like me. What is your view?

Steve Gooding: The trade we are balancing there, and it is a very difficult one to do, is between the whole-life carbon implications of a vehicle—the embedded carbon in its manufacturer and at its end of life—compared with the emissions in use of the vehicle. Undoubtedly, if you stop driving a petrol car and start driving an electric one, the tailpipe emissions go away and there are benefits for air quality as well as in real-time carbon emissions from that. However, there is embedded carbon in the car that you are currently driving.

A lot depends on how many miles you do. If you are not doing that many miles in that small car with that relatively efficient engine, hanging on to it for a bit longer is probably not that bad an idea in the grand scheme of things, not least for the reason one of my colleagues on the panel mentioned: we have yet to see really competitive small cars coming

through in the electric market so far. So maybe hanging on was the right advice from whoever gave it last time.

Baroness Boycott: When these small cars like mine get to the end of their life, what will people then do with them, given that presumably they will be useless for parts and scrappage, because there are no more cars of that type?

Steve Gooding: For some time now we have had obligations that apply throughout the auto industry about the recyclability of the vehicles. It will develop in the electric market as well, but at the end of its life there is a possibility—and we need to give thought to this—that the vehicle will turn up somewhere else in the world in use, which, of course, is still an issue for carbon. The likelihood is that it will probably be scrapped at the end of its life, but by scrapped we mean dismantled and that all the elements of it that can be recycled and reused would be.

Baroness Boycott: Is there a big market to other countries of old cars from Europe?

Steve Gooding: I am not an expert on that, but we would definitely see some transfer of vehicles from this country into Africa and Asia.

Q25 **The Duke of Wellington:** My question is directed to the National Grid; I realise there is a question on it later. We have heard, I believe, that one of the problems about going to electric vehicles is whether the National Grid can cope with that number of vehicles being charged every day. Yet from your brief remarks earlier, you did not express any doubt about your ability to cope with this increased demand. Is that really the case?

Dr Russell Fowler: Yes, I believe it is. It is important to break that down into two parts. As I mentioned, I represent the transmission system, the high-voltage system. This moves power from power stations to the local grid. There is excess capacity on that system. At the moment, peak demand on the system there was around 2006. We have seen energy efficiency and the changes in the economy reduce demand on the system, so there is capacity on the high-voltage system. I think you may be referring to the local distribution grid and physically connecting EV chargers as quickly as we can. One thing to reflect on there is the increase that we have seen. In the last two years in our distribution business we have connected more EV chargers, from home chargers right up to the large rapid chargers, than ever before, and we think that rate will increase over the next five years as well.

There is a large increase in the number of people looking to connect to the system, so we come to three issues, as we see it. One is planning. Whenever you build anything, you interact with the planning system, so we need to make sure that the planning system is as efficient as it can be in consent times and so on. When you move up to the larger renewable projects that we hear about in the media, this is where you spend a long amount of time in planning. There are similar issues when you get down to the low-voltage systems. Although obviously they do not have quite

the same scale, you still come into the planning system, so it is about making that as efficient as we can.

On connections themselves, the best way to describe how connections work at the moment is “first come, first served”. There are lots of people in the connection queue. Your project may be very viable. You may be ready to go. You may have finance and everything ready to go. People ahead in the queue may be less viable, but they get served first because that is the nature of the system now. We are looking at ways in which we can reform that to make it more “first served, first ready”, so that if you have everything ready you can be served first. We are also looking at whether there is a case for more strategic projects that should be fast-tracked, so to speak, but again you would need regulatory and political support to be able to do that. We would not be able to do that unilaterally.

Finally, it is about the broader regulation. We know that electric vehicles are coming. The current regulatory framework says that you need a signal before you begin that work as well, so you would need a charge point to look to connect to the system before you begin the work. Can we move to a system where you can anticipate that that is coming in and start to build the wider reinforcement that you need—not the physical connection, but all the work that you need beforehand to be able to connect that?

That comes back down to the certainty and the collaboration. You need to be certain about electric vehicles; we have heard other people talk about certainty about the date and the pathway, which chargers they will be, where they will be, and so on. There is confidence, but work needs to be done before that to fully see that through.

Q26 Lord Duncan of Springbank: In evidence last week, there was a discussion about the drivers of the change in the fleet market and the second-hand market being left behind, and there being a dislocation between the two. There was a suggestion that more had to be done to try to support the second-hand market in order to make sure that there was not a runaway fleet market that eventually fell over.

Combined with that was a recognition that a number of groups would be left behind, because the fleet market by its nature is a completely unique group, leaving behind, one would argue, the poor, the elderly, the retired, people in rural areas potentially. What, then, do you see are the real problems in that disconnect between the fleet market and the rest? What would you recommend be done to make sure that this was a smoother transition rather than an interrupted one?

Ian Johnston: The situation you have described has another level of detail to it. For many fleet drivers, the cost of recharging a vehicle is, in fact, carried by the employer and not by the individual. For us to be truly successful in the transition, we need to ensure that everybody has access to reliable and affordable charging. At the moment, of course, we have this disparity whereby the rate of VAT for those who do not have access

to charging at home on their driveway is four times higher for those who are completely reliant on the public network.

There are some quite quick wins that can be achieved in a short period of time that would change the landscape for those who are not fortunate enough to have a private driveway or an employer that pays for their charging. That is one big disparity that we are seeing a lot at the moment, particularly in the context of the energy crisis we have been through in the last two years.

Steve Gooding: There is a risk, which we are seeing now, that the first big wave of fleet purchasers who went into electric based on the benefit in kind regime, which is a key lever the Government can pull to encourage the uptake of EVs, quite possibly got their actuarial valuation of second-hand values wrong. I suspect they did, and I suspect we are seeing a market that, let us remember, is in its very early stages. I am not sure it is realistic to think that government can step in and help out here. I fear that some people have taken a punt and might have got their sums wrong, and that some people might lose money. Ultimately, the value of a used car is what people are willing to pay for it, and that value will find its way in the market, I suspect.

Lord Duncan of Springbank: Does that not then slow down the fleet end of the market as well? If they cannot get their money and return from the second-hand system, that interruption may well affect the fleet.

Steve Gooding: It could; there is a risk of that. But we also have to recognise that, to a huge extent, those fleet purchases are made on a two or three-year cycle. They will be hugely influenced by the whole-life cost. They will take account of what the used prices turn out to be, but, by turn, as we heard earlier, there is also pressure on the manufacturers to come forward with lower-priced and more affordable vehicles into that market. After all, one of the biggest selling cars in this country until very recently was the Ford Fiesta, which is quite a small family run-around.

Jonathan Marshall: An issue with supporting the second-hand market is that it will distort who bears the cost of the depreciation of these new cars. If you meddle in the second-hand market in some way to shield fleet owners or operators from the cost of their cars falling in value, someone else has to pick up the tab for that. If it was supporting the second-hand market through subsidising second-hand car sales, for example, it would be the taxpayer making second-hand cars more expensive. The other issue with that is that anything you do to support purchasing second-hand cars will make them more expensive, which will put them further out of the reach of people who would be able to afford them were it not for that intervention.

Q27 **Baroness Bray of Coln:** Listening to your conversation, it is all about fully electric cars. Yet when you touched on sales at the beginning, I think you suggested that hybrids are still a better seller than fully electric cars. I thought that you said 4% hybrids and 2%—

Melanie Shufflebotham: No, it was 2.5% pure electric. The plug-in hybrids are 1.5%.

Baroness Bray of Coln: Okay. I still think they have a role to play, yet I get the impression from hearing all the evidence we have been taking that they are of no interest and are just being phased out as quickly as possible. For me, they seem to be one of the most important steps to giving people confidence to move in that direction, particularly the plug-in types. Do you see a role for the hybrid, or do you think that the sooner we can phase it out and get everybody on to full electric the better?

Melanie Shufflebotham: My opinion is that, five years ago, when the average range of an electric car may have been 100, 120, 150 miles, it was important to have those plug-in hybrids to give people a bit of confidence in the transition. Now that the new cars are 250, 300, 350 miles, they are not needed. Plug-in hybrids are heavier and more expensive to make. They have an engine and a motor, so the cost of production of these cars is much greater than the cost of production of pure electric. For me, they were a transition, but not anymore, and we should be pushing for full electric.

On a sub-point, the language we use is important. Now I am getting a lot of people saying, "I have a hybrid". Is that a hybrid, a petrol or diesel car with a small bit of electric regenerative braking, or a plug-in hybrid? There is a big difference between them, but to me it is very much a transition technology, and their time has passed.

Q28 **Lord Lucas:** Which national policies and initiatives have been successful, and which have hindered the adoption of electric vehicles?

Ian Johnston: I would say that the most important intervention was the announcement in 2020 of the phase-out date of 2030, because it changed almost overnight the British public's understanding and expectation that they would be making the transition. It also gave a very important signal of confidence to investors to come into the UK and to fund this industry of charging infrastructure behind it. Once again, you see the importance of a bold and ambitious statement going forward.

I think we are due to talk about the consumer regulations, but again, in terms of bold statements, we need to give the British public the confidence that there will be a reliable charging network for them when they need to use it. The role of government in making bold, ambitious statements to signal intent and direction is making a large change in the private markets.

Steve Gooding: There has also been success in the grants that have been made available, which again is part of the transition here. The early electric cars were a lot more expensive than their ICE comparators. Grant schemes help with that. I would not say it is a negative, but the Government might need to have another think about domestic chargers and how much they cost. There has been a grant scheme for domestic charge points—indeed, extending to apartment blocks and the like. As we

move into a world where vehicles are coming into the second-hand market, the used market—into the £5,000 to £10,000 bracket—the idea that people will be happy to spend £500 or more on a domestic charger when the vehicle costs only £5,000 might turn out to be an issue. That is something the Office for Zero Emission Vehicles is thinking about.

Jonathan Marshall: One policy that has been quite detrimental is the freeze in fuel duty. In real terms, fuel duty is now 31% lower than it was in 2010. As much as there are signals on phase-out dates and grants, petrol and diesel driving not bearing the full cost of the externalities it causes is another thing that incentivises people not to move to electric vehicles.

Dr Russell Fowler: I agree with Ian on those bold policies. One that I would like to highlight is the rapid charging fund. It is a very bold policy to say that we need rapid charging at every motorway service area, because that reduces charger anxiety, so to speak. We still need to see action and strategy to be able to deliver them, again to give certainty to charge point operators and for network businesses to be able to connect them. Given the size of them and the geographic locations, they are naturally challenging and time consuming to do, so policy is great for making sure that we have the strategy that sits behind to be able to deliver them as well.

Melanie Shuffelebotham: In parallel with the rapid charging fund, which was announced maybe four years ago and has not made much progress, the LEVI—local EV infrastructure—scheme is important for supporting the real need at the local level for each local authority to have a strategy and a plan. It has already announced a number of awards, and it is important because it is about not only capital cost but the operational costs. I am looking forward to that accelerating the provision of local charging, because that is a real area of concern for me. Some areas have done brilliantly and others have done zero. If we are to get the 40% of households who do not have off-street parking to adopt, there needs to be local charging provision.

Q29 **Lord Lucas:** You noted the failure of small, low-speed, low-range, cheap electric vehicles to appear. I put that down to vehicle regulations. These vehicles exist in China, so why are they not being brought in? Why are we not developing these things ourselves? Can you see a policy that has resulted in there being no vehicles in that segment, or do we just have to hang on until some manufacturer says that they do not want to sell that car for £30,000, they want to sell it for £5,000? To pick up on something we discussed in the Lords yesterday, do you see the failure of the Government to support local electricity generation as making it more difficult to roll out cheap charging networks?

Steve Gooding: I will pick up the first one and my colleague can answer your second point. We are starting to see those smaller vehicles coming through, including from China. We have seen Fiat and Citroën bringing forward what I think they call urban cars. They are very small, very light. It has been a challenge for the traditional auto companies to come up

with a product that will, let us face it, make them money and fit with all the other things we are asking for here. They have found it a struggle to produce vehicles that are smaller, lighter, and still have the range that we are expecting as consumers from these vehicles.

It is hard to see whether they will necessarily come through in the volumes we are used to, but we are certainly seeing some clever thinking in the auto companies; for example, using different materials to lower the overall weight of the vehicle and to trim the cost of producing the vehicle. The auto industry has become extremely good over years and very familiar with the technologies that it has been using. It has been coming on in leaps and bounds, but it is not there yet. I am not sure that there is a regulatory solution to that. What we see in places like China is a much more state-interventionist approach. Maybe we want to go down that path, but maybe, in turn, improved trade relations with China will see those vehicles flooding in anyway.

Jonathan Marshall: Car companies sell larger cars, premium cars, because that is where the demand is for these vehicles at the moment. Larger cars also come with higher profit margins. Companies will not do anything to disrupt this handy little system at the moment where people want expensive cars, and the expensive cars that they are being offered are electric. It is only, again, as the market develops, as the electric car technology moves down the vehicle range so that it is available to more cars—that should happen through existing mandates and existing regulations and as consumer demand from people who do not want big cars continues to grow—that should, in theory, drive the changes in the types of vehicles that are being sold without anything particularly heavy-handed from government.

Dr Russell Fowler: I am not hugely familiar with the detail of the local energy market, but generally when you have local generation, again, things need to be connected to the system, and that goes to the queue that we talked about earlier. There are obviously challenges around that.

We often see charging being paired with local generation and solar, and generally more with storage as well as the popular way to do it. When you are looking at a connection, you are often looking at a supply, a battery and a source of demand as well, so you have the three together. We see that as quite popular, because it reduces the overall capacity of the connection you require. You can generate some yourself and it can help you to manage the peak through the battery. I am more than happy to get back to you with more detail, if that is helpful.

Q30 **Baroness Jones of Whitchurch:** Can I push you a little bit more? You talked about the importance of rapid charging at motorways. The Moto Hospitality chief executive was on the radio recently saying that at four motorway locations he has charge points sitting there with no power. There is a bit of a disconnect in your ambitions and the practicality of what is happening. Are those motorway charging points just in the queue—"first come, first served"? Is that the problem? If it is important to have those rapid charge points in those long-distance venues, how can

you speed that up? Otherwise, people will get frustrated with the system.

Dr Russell Fowler: I agree. I think you are right in your assessment that they are part of the queue in the planning system that I spoke about. Yes, they will have time to connect them.

When you go through your connection process, it often depends on the size of the connection that you want. Broadly speaking, the larger your connection—so lots of rapid chargers—the more time it will take and the more complex it will be. It also depends on the local grid around you and whether there is spare capacity already. If you have smaller, slower chargers in a part of the grid that has lots of capacity, for example, you are talking about a few months to get that. As you get larger and the available capacity on the grid gets less, the more complex the system becomes, so you will interact with the planning system in order to get things like closing roads and permits and consents, all those bits and pieces. Everything else that is in the connection queue also needs to be done, so when you are building that system out you need to look at the whole-system approach for everything that is going on there. There are also sometimes knock-on effects on others, which may push times back further than would be ideal.

In terms of what you can do to overcome that, if you move away from “first come, first served”, who else is in that queue? Do they have a project that is ready to go, or are you doing work for a less viable project? Can you move that further up the queue? Can you be more efficient, say, with the planning system? You only have the grid, but you often have other people who will be interacting with the planning, especially if you are expanding a site, for example, to get chargers on it, or you are expanding your parking. Can we be more co-ordinated in that way? The big point is the signal to begin that work. That is when they put in the application saying, “We want to put these chargers in there”.

Going back to the rapid charging fund, if we had more certainty about that and we knew they were coming, could we begin some of the reinforcement work before they began? If that was ready, it would only be your more local work that you had to do there. That is the issue. If you get into a more anticipatory investment mindset, you can deliver that more quickly and start to overcome those barriers. That is what the rapid charging fund is trying to unlock. As we mentioned earlier, that is still locked in policy at the moment, so that has not gone through. It is just private investment, at this point.

Baroness Jones of Whitchurch: If you wanted to put charge points in a motorway service station, you still have to have planning permission. You would have thought that would be a bit of a no-brainer. If there is already an infrastructure supporting fuel of all sorts at motorway service stations, you would not have to get planning permission for a charging point.

Ian Johnston: I know we will come on to this later, but, from our perspective, the 40% increase in the deployment of charging, which we

have talked about, is fantastic to see, but we all want and need it to go faster. It is important to note that it is not just a grid situation that we are discussing here. There are processes that we go through on grid, on planning and on highways, each of which present their own challenges that we have to go through, and we need better co-ordination between the three of them.

In the case of planning, if you forget the large motorway service stations for a minute and go back to the very small installations, in many cases we are still required to apply for planning. We go through the same planning system, the same planning queues, alongside every other planning application within a local authority. Again, prioritisation of these projects based on strategic interests and priorities is exciting for us to talk about, because we are sat behind other projects in the queue from a highways perspective as well.

Those three processes interact at different points. Of course, the planning conditions that are granted to you will mention the requirements and the standards to which you must deliver the highway works, so you have to liaise between the highways and the planning. To make your grid connection you need the highways team to give you the road access at the time. The deployment process of EV charging infrastructure needs to bring those three processes together.

You read the news stories about 10-year delays to offshore wind farms and new power stations, but that is not what we are talking about here at all. As Dr Fowler has said, we are connecting 99% of EV charging projects to the local district network, so we are working with government, the DNOs, the ENA and the planning offices now to achieve ground-level, tangible solutions to standardise processes across the 14 different grid offices or hundreds of planning offices. These are near-term enhancements that we can make to allow us to deploy more quickly.

That is a very long answer to your question. Scotland has just brought in permitted development rights for EV charging projects within a reasonable scale, which is great news. Again, for us, the minute we install any chargers over a certain height, we have to go through the planning system.

Lord Lilley: What height is that?

Ian Johnston: It depends on the type of installation, but typically it is around 1.8 metres to 2 metres. When you are putting charge points on to a kerb, you can breach it pretty quickly. When you are putting in a substation, you need to get a permit straightaway. There are simple things that we can all do here that will increase the pace at which we can deploy. We are engaged with the department to provide data so that we can bring those changes about, because they do not require the high level of reforms that Dr Fowler was talking about.

Lord Lilley: This is breathtaking. Does a tall man who is over 2 metres high require planning permission to stand in a car park?

Lord Lucas: That has been the problem, has it?

Lord Lilley: Well, I do not know. It is breathtaking.

The Chair: You have opened up a very interesting line for us to follow up, so thank you, Baroness Jones, for opening up that discussion.

Q31 **Baroness Young of Old Scone:** At the moment, there is a whole load of different charging systems. That seems to be beginning to coalesce, but there is no requirement to do so. Do you think there ought to be a statutory requirement to coalesce around one system and, if not, how do we cope with more than one system?

Ian Johnston: No, I do not think we need to regulate this. The good news is that the automotive industry and consumers have decided that, for Europe, one of the standards, the CCS standard, will be the way forward. This year, 200,000 new battery electric vehicles have been registered in the UK, so 98.5% of those all carry the CCS adapter and less than 2% carry the CHAdeMO adapter. I think the decision has been made as to where the future is going.

A question from some people is: when we do get these cheaper Chinese models coming into the market? What if they have reverted to the CHAdeMO connector? Entrants that we are seeing already, such as the BYD models or NIO, are now carrying the CCS as well. I think we can sit with comfort that the route has been decided and it is CCS.

The next question would be: what about the drivers who are on the roads with a CHAdeMO car? They have made that investment. They have made the switch ahead of others. The good news is that the vast majority of charge points that are being installed across the UK today—the 48,000 in the ground—offer both connectors. I do not see this as a point of concern or challenge going forward.

Baroness Young of Old Scone: Melanie, are you as relaxed as Ian is about this?

Melanie Shufflebotham: Ian is right about the rapid DC connectors. There is coalescing around CCS, which is great. The best-selling EV in the UK until the Tesla Model 3 came along was the Nissan Leaf, which you have probably all heard of. Up to 2020, there were 40,000 of those in the UK, and those are the ones that are coming on to the second-hand market now. They are CHAdeMO, so it is very important that we still support that. There are a lot out there.

However, I agree that CCS is what is happening. Even Tesla, which has a different charger, last week launched its CCS connector, which will be open to everyone. That is another indication. It is different in the US. You might have heard that, in the US, 70% of all cars are Tesla, so they are going to the Tesla standard. In Europe and in the UK, we are pretty confident about the CCS.

There is a whole other set of chargers that are on the AC network. Those are standard for the Mennekes Type 2. So we will end up with Type 2 Mennekes for the AC charging, which is the low-powered network—22 kilowatts and below—and CCS for the high-powered DC network. So two different networks.

Baroness Young of Old Scone: How do I cope if I have a low-rate charger in my drive that has one connector, and then I top up somewhere on a motorway on a high-speed connector with a different charger?

Melanie Shufflebotham: It is not a problem. In your car you have two on-board chargers. One is the DC connector. If you go to a motorway service, they are all tethered, all rapid chargers—anything 50 kilowatts and above is tethered—so you just use that connector. Then you have your low-powered AC connector, which is a Mennekes one, and that is what you use for charging at home, at a hotel or at destination chargers, which are on the low-powered network.

Baroness Young of Old Scone: Do you think that the great British public will cope with the complexities of this?

Melanie Shufflebotham: It is definitely one of the challenges. We hear stories of people getting an EV and maybe not getting the good information, and charging on a 7-kilowatt charger and saying, "Why is that taking me 10 hours?" Clearly, if you want to charge quickly, you need to be on your DC rapid charger, if that makes sense. Once you have an EV you pretty quickly work it out. There are two different systems; one is for overnight charging or top-up charging, and the other is for en route charging. They are very different.

The Chair: You keep one in the boot and one at home. That is what we do.

Q32 **Baroness Boycott:** Sticking with charging, the target is 300,000 by 2030 and 6,000 rapid chargers by 2035. Is that enough? How did we get to those figures?

Melanie Shufflebotham: First, that is just a number of many within a range. Following on from what I was saying before, chargers are different. Broadly, there is the low-powered network and the high-powered network. Out of that 48,000, 39,000 are on the low-powered network, and 9,000 are on the high-powered network. The 9,000 are the ones that you imagine are equivalent of charging up at a petrol station, and the rest are low powered for overnight charging, top-up charging and destination charging. They are not all created equal. Although 80% are low powered and 20% are high powered, when you look at capacity it is the other way around. The number 300,000 is slightly arbitrary, because we do not know how the charging point network will develop.

Baroness Boycott: Is it not quite a muddle that we do not know how many we really need and, therefore, do not know what we are aiming for? I also do not understand why there are so few rapid chargers. Is that

not what people will want?

Ian Johnston: From our perspective, it is counterproductive to talk about a number that we need to work towards. To agree with what Melanie was saying, we need the right types of charging infrastructure in the right locations. That will change from town to town, from region to region, driven by the characteristics of the population, the housing stock and its access to driveways, and the driving behaviour that we see in different regions across the UK.

When people talk about numbers of chargers per region, it really misses the point. A large part of the population charges every night at home in the same way we all plug our phones in at home. They may use public networks once a month, twice a month, or more frequently. We need to make sure that there is a high provision of charging for people who do not have lots of driveways in their area. Of course, the highways also need the charging. We like to move away from talking about a magic number to making sure that we are seeing provision across the various different segments of user cases for it.

Baroness Boycott: Would you envisage all garages having electric charging, or will that also not be necessary?

Ian Johnston: One of the exciting things here is that, because of the ubiquitous nature of electricity, you can charge your car anywhere where there is electricity. It means that you no longer need to make a defined route to a gas station to refuel your vehicle; you can charge at the supermarket, at the train station, at your workplace.

That said, the forecourt operators in the UK are making some impressive steps forward in deploying high-powered charging at their forecourts, despite the fact that there are obviously challenges in putting electric infrastructure around large gas tanks. It is happening. We have seen a huge rollout in the last two years across the forecourts, but it is not just about charging at forecourts; you can now charge your car while shopping, sleeping or at work.

Baroness Boycott: Can you explain to us what they have done in Scotland? I did not completely understand it, but it sounded important.

Ian Johnston: For certain types of project now you are not required to submit a planning application and to wait to get the planning permit for an EV charging hub or a substation.

Baroness Boycott: Would you like that here?

Ian Johnston: I would love that here. It would, without exaggeration, take between six to nine months off the average deployment.

Baroness Boycott: Where would that legislation sit, in your mind?

Ian Johnston: We need that in England and Wales.

Baroness Boycott: So for England and Wales that it would specifically say that you do not need planning for charging points? That is what they have done in Scotland. What conversations have you had with the Government about trying to do the same thing here, and has there been resistance?

Ian Johnston: Clearly, we cannot build charging points everywhere, such as at grade 2 listed buildings or in areas of outstanding natural beauty. Our conversations have been about where the acceptable bar is for building without requiring planning permission and what the specifications are of what we all want to see, which is lots of chargers above a certain height threshold with canopies, with lighting. The company I run has just opened a huge charging hub down in Devon. It is a fantastic facility, but we are still waiting for planning to put the lighting in for security and safety. Our work with government is focused on the specifics of what should be allowed within that project for it to just flow through the system.

Baroness Boycott: All right. What about putting them in urban areas? Why would you need lighting and canopies? The ones at the end of my street are just in the lamp post now.

Ian Johnston: You are correct that you do not need canopies for lamp posts, but some of our members are trying to create larger sites with bespoke weather protection. Lighting is very important for safety. There are restrictions on what we do with things like CCTV and the environment around the charging area, the bay. There is a standard format that we have agreed with the Scottish Government, and if we can achieve that in England and Wales, it would make a big difference for deployment here.

Q33 **Lord Lucas:** A level of information is available from Zapmap and elsewhere as to where demand is. How is it evolving? Where do we need to change the charging network? Is it good enough, or do we need to do more to make sure that our information base is better?

Ian Johnston: I will take a step back and set the scene for how the charging networks are thinking about where to put the infrastructure. I talked about the £6 billion of private investment that has come in and is growing every day. People like me who sit in these charging businesses are under immense pressure every day—from the investors and the consumers, who want to see more—to deploy as much infrastructure as possible.

The key message I need to deliver here is that we are investing in this infrastructure ahead of demand, ahead of the vehicles coming, and we are not being selective about where it is. We are seeing the rollout happening right across rural and city centre areas. Some patches are seeing more deployment than others because of a certain barrier in a given region that we are trying to unlock, which again could be about planning, highways, or a conversation that we are working on with the grid operator. I do not see any of the charging networks not trying to deploy as much infrastructure everywhere. There is a highly competitive

race to have the biggest network. Billions of pounds are going in. We need that infrastructure to be used. We want to put it where the people are asking for it now, because we need to get to a breakeven position.

Lord Lucas: Do you have enough information on where people are asking for it?

Ian Johnston: If you go up to a high-powered rapid-charging level, clearly you are looking at people taking journeys. There is a load of data on where human beings like to go, where they like to shop, where they like to drive and where they go to work. That is fine. There is probably an opportunity at the local authority level to make it easier for the charging businesses to engage with residents on where they do and do not want charge points situated. There is a TRO consultation going on at present, and including a provision for EV charger location in it would make it easier to get it right for where people want it in more congested, densely populated areas.

The Chair: Sorry, what is a TRO consultation?

Ian Johnston: I am happy to follow up in writing with a lot more detail on that, because it could be quite a long answer.

The Chair: That is great.

Steve Gooding: I want to perhaps augment or give a subtly different sense here. From the foundation, we would say that there is a case for getting more data. We see what OZEV is proposing and we are very supportive of that. We would draw parallels with what the Department for Transport has done recently in relation to bus service operations; there are obligations on the bus companies to provide real-time data so that we can all see what is happening, not just the important information from the industry, which needs to understand where the demand is bubbling up, where the demand is exceeding supply, where a good place is to be putting more chargers in.

I am sure we will come on to this, but, if consumers are to have a guarantee, we need to know that the chargers are fully functioning. We have the objective of them being in fully functioning use or availability 99% of the time. That needs to be checked and monitored, and we would argue that the more open data there is that organisations like mine and Melanie's have access to so that we can see exactly what is going on, the clearer things will be for us.

The Office of Rail and Road spotted problems with the TransPennine railway—which had been gaming the system by cancelling trains late at night so they did not count as cancellations—because somebody had access to the data. I cast no aspersions on any of the companies here today. I am just saying that the more open the system is, the more likely it is that people will spot gaming, were it to happen, and the clearer we can all be. It is so important for building confidence, because it is one thing to have the regulations to protect consumer interest—I suspect we

will come on to this—and another to make sure that the spirit is being followed as well as the letter.

- Q34 **Lord Whitty:** On this issue of permitted development rights, what is the Government's objection to having permitted development rights in England and Wales? We have this interminable Bill going through the House at the moment. Would it not be easier for them to put it in that, or do they have a coherent argument against it?

Ian Johnston: I do not think we are seeing opposition from government about it. I think it is a process that we need to go through. Again, the conversation we have had is that everyone agrees that it is a positive step forward. We, of course, would just love to see it as soon as possible.

- Q35 **Lord Lilley:** I spoke to a distinguished former Secretary of State for Transport the other day, who shall remain nameless, and he said that he thinks we will end up with too many charging points, because the range of batteries will increase. The average car does 12,000 miles a year. If you recharge a car every 200 to 250 miles, you only have to recharge once a week. The only important thing, therefore, is having fast chargers away from home that will charge four times as many cars as slow chargers. No one wants to wait three-quarters of an hour to recharge their car. Therefore, the only problem is at-home charging for those who do not have residential parking.

First, do you agree with that? Secondly, we never had a plan for petrol stations. People built petrol stations because there was demand for it and it seemed to work. Do we need a plan? We need sensible planning rules to remove obstacles to things, but if we remove the obstacles, will people not just build charging points where they are needed, except for the domestic charging where it is physically impossible?

Steve Gooding: There is a material risk that that former Transport Secretary is right: that we might end up with more in some places than we need. What is missing from that is the importance of building confidence. At the moment, one of the big challenges with whatever number the Government alight on is that what matters is whether, if you are thinking about going electric, you are confident that you can get your car recharged. Maybe that will require some investment that turns out to be redundant in the long term. It is very hard to say.

On the second part of your question, I think the key difference here is that the first petrol station opened in this country in 1919, and it was a revelation. We can see how things developed from that point onwards. However, it was not a government policy that we should have cars. In a different way now, we have cars, and it is government policy that we should change the nature of the cars we use because we have a pressing climate crisis. That is why it is relevant for the Government to be intervening here. Otherwise, I would be inclined to agree with the implication of your question. There is a demand here, there is a market here. What is the case for government intervention? It is because the Government would like you to change your car.

Melanie Shufflebotham: What is interesting is that the market has developed. There used to be a whole load of people worrying about range, but now it is reasonably clear to people who have off-street parking that they charge up overnight and infrequently, maybe once or twice a month, and use a rapid charger en route. When we survey our users, they are very happy and will never go back to a petrol or diesel car. As you say, the issue is people who do not have that amazing benefit of electric cars or off-street parking, and there are quite a lot of them. It is maybe 40% of households, so it is very relevant that they have some kind of charging provision in order to be able to operate the car.

There are lots of different solutions. There are on-street chargers. There are low-tech things like gullies over the pavements. There are local charging hubs. All those solutions are being tried out, and I think there will be lots of different solutions eventually. On your first point about whether there will be too many, I think there will for a period of time, and then it will be about price, and the market will take its place. There will be some places where the market does not automatically install rapid or ultra-rapid charge points, which are very expensive, such as in Wales on the main routes in Wales. The Welsh Government have stepped in to install rapid and ultra-rapid charge points there, which is very important because there is a market failure there.

Q36 **Lord Bruce of Bennachie:** We talk about regulations, and the Government have set a target and have more or less said to the market, "Deliver it". They have now published their public charge point regulations. First, how do you assess those? Are they comprehensive enough? Will they work? Are they necessary? Will they make life easier for the consumer? To what extent is there tension between regulation and the market? You are all telling us that the market is responding very well, but equally there are gaps. Are the regulations the answer, and are they addressing the right issues in the right way?

Ian Johnston: As the people being regulated, we welcome the consumer regulations, as I said earlier, to give drivers the vital confidence that the network is there for them. We are building a network today where we need it to be as easy to recharge your electric car as it has always been for you to refuel your petrol and diesel car.

To go back to my earlier point about the availability of electricity, it should be even easier, because you should not need to make a special visit. You can charge your car in any number of places. If you take my other earlier point about the amount of investment going into this space today, we cannot afford to invest all this money in building this infrastructure and have you turn up to one of our chargers and it does not work, because you will simply never come back, the business will die and the investment is burnt.

We welcome the regulations. They are very important. It is interesting that many of the regulations were very live issues two years ago when they were drafted. To be fair, the private market has since addressed them. If you look at the situation with reliability, open data and roaming,

most of the networks are now doing this anyway without the regulations. ChargeUK was delighted to collaborate with government, and we are still working with government on defining some of the pieces just to make sure that there are no unintended consequences in relation to some of the data and roaming pieces. We have another session this afternoon with the department. We think the regulations are fantastic. I would say, and I hope that the panel would agree, that the private market is in a different world now from where it was two years ago in relation to the concerns about reliability, roaming and open data.

Lord Bruce of Bennachie: You are sort of implying that you do not think the regulations are necessary now.

Ian Johnston: I think they are. There is a huge job for everybody to do in the communication space and in reassuring and explaining how this new world works, so that people do not feel that this is being done to them. Having consumer regulations on people not meeting them is an important lower bar to have. My point is that the private market has gone above and beyond it, from my perspective.

Melanie Shufflebotham: We also support the consumer regulations. On the 99% reliability point, it is a big concern for EV drivers. They want to be able to turn up at a charge point and find it to be reliable. At Zapmap we can see all the status information on over 70% of chargers, so we can monitor that. A couple of years ago, it was running at 7% at any point in time, so there were different snapshots of what was out of service, and now it is running at 4%. It is still a little way off from the 99%, so we welcome the push towards more reliability. As Ian says, a lot of charging operators are already at 99%, but there are some who are not at that stage, so we need to keep the pressure on and make sure that charge points are maintained—that people come out to fix them and are focussed on making sure that they are reliable for consumers.

The other point is about roaming. Contactless payment on rapid chargers is what EV drivers want. That is great and, as Ian says, the vast majority of rapid and ultra-rapid chargers already offer contactless payment. I think there will be a challenge in the low-powered network where it is not economic to add contactless payment. Ideally, an EV driver would be able to use a single point of payment wherever they turn up. I do not know whether it needs regulation, but I would like to see more charge point operators open up their network so that companies like ours, which try to provide a service to EV drivers, can offer it across all networks.

Lord Bruce of Bennachie: All this data is publicly available. That is what the regulations require. How will that affect how the market responds? Where it fails to respond, who will fill the gap? Is there a need for some kind of regulator, ombudsman or whatever who would identify market failure?

Steve Gooding: There is no reason why in principle. First, we would definitely say that regulations are needed. It is great that the market has been moving hand in hand, because that is the ideal, but I guess we will

never know whether the market would have moved as quickly in response to consumer demand if the regulations had not been developed. We think that we need them. We think that they need to be policed.

Does it need an ombudsman? There is no reason in principle why the Office for Zero Emission Vehicles itself could not be the ombudsman or police service for this. We say that somebody somewhere has to have it in their job description to monitor not just whether this data is being provided but what this data is telling us and, if compliance is not being achieved, who will do something about it. There are many different structures that one could envisage for achieving that, but we would say that we absolutely need somebody whose day job that is.

One thing that we think has not been clear enough—this is another of those connections that comes about because of this new market—is the extent to which a charge point needs mobile signal coverage. There are still places where the mobile connection for your phone and for your car could be different, and we continue to think that Ofcom and the Government could have been more helpful in indicating where signal coverage was adequate from all our networks, because that is what we need in order to ensure that charge points function. Quite often, we find that charge points might be functional, but you cannot get the signal to connect your phone, so you cannot unlock the device. This is a problem that needs to be picked up.

Lastly, the BSI has developed a very good voluntary code so that disabled people can access charge points. We would argue that when public money is being put in to support the installation of charge points, surely that should be a mandatory code.

Ian Johnston: Going back to the charge point network's mindset about the open data points, billions of pounds are being deployed into the infrastructure, so clearly we need as many people as possible to use it to generate the return for the investors. If each of you sets out for a journey in your electric car, you will each take a different route in selecting where you might stop. You might use the in-car satnav system, you might look on Zapmap, or you might look on many of the other providers that are available. From my perspective, I want you to see my infrastructure wherever you look.

This is why you have seen, in the last few years, the shift to the charging networks opening up their data in a race to provide the most accurate data. If you choose to drive to one of our sites, we would like it to be ready for you, available and at the price that we told you it would be. The competition in the private market is driving this behaviour. I want you pay me money to charge your car. I want you to see the charge rate you should expect and the price you should pay. If you have a bad experience with my company, you will go to my competitor next week. That is what is driving this desire to push the data as best we can to all the sources that push it to the driver.

Q37 **The Chair:** On the SI, Melanie made a point about how the public want

the charge points to be straightforward, contactless and roaming. There was a big expectation that the SI would cover charge points under 8 kilowatts. Those of us who have read the SI see that it does not include charge points under 8 kilowatts, yet those are the majority at the moment, and it is where we are expecting the most growth in the next 10 years. There was an argument that it was because there was a strong lobby by the industry about cost, so the regulations have been watered down. Given your strength of support for the regulations, perhaps you would like to comment on that omission.

Ian Johnston: Yes. From a public rapid DC charging perspective, contactless is obviously essential, and we are leading Europe on that. From an AC charging perspective, here you are talking about a small charging unit. A rapid charger might cost you in the region of £15,000 to £60,000, but with the slower charge installations you are installing a high number of very low-cost units. To add a contactless card reader device to that could double the cost of the installation in some cases, which would, of course, bring down the deployment rate. More important is the fact that there are very few, or limited, actual market solutions. You cannot simply take an AC charger with a contactless reader off the shelf.

This is less of an issue, because if you look at the user case of the slower charger—people who might charge at a lamp post, outside their house or their workplace—it is often the same users using it almost as their residential charger, so they are more likely to have an account and pay through the many apps, which also opens up the opportunity for time of day tariff saving and other opportunities.

The final supplemental point is that, because the large majority of networks are now roaming, there are payment platforms where the drivers can charge on a number of AC charging units with one payment account. If our goal is to deliver this infrastructure for the phase-out date, bringing in and mandating contactless readers on all charge points that the public use would have been an unintended consequence. It would have slowed down the rollout on those slower chargers.

Q38 Lord Whitty: I am concerned about those who do not have access to off-street parking at home, or it is not accessible. I live in two places. One is an eight-storey flat in Pimlico, and one is a townhouse in a small rural town, most of whose property is flat on to the street, in the inner part of the town anyway. The people I come across normally do not have access. They cannot do it at home, so they are discriminated against because they have to go elsewhere. They have to pay your companies significant amounts of money and a higher rate of VAT. Does this worry the industry? Should the Government do something about it? Can you think of any other solutions? Inner-city areas tend to have less affluent populations. Parking restrictions will also affect this, because they cannot put a wire across a pavement immediately outside their house. Should something be done? On the figures, Melanie mentioned 40%, and we have been told 30%. Is one households and one car owners?

Melanie Shufflebotham: I guess there is no exact figure, so it is somewhere between 30% and 40%, because some people may be renting so they cannot install a charge point. It is a big issue and is what the current government LEVI fund is trying to address. That is the first step towards that. That will be rolled out. There are already 18,000 on-street chargers across the UK. Out of the 48,000, 18,000 are on-street chargers. That is growing at 55% a year, so it is growing ahead of the market. It is an issue. It needs to be rolled out at pace to support these people, but the key is that there is not necessarily just one solution.

The other point is that 80% of those 900,000 pure EV drivers currently have a charging point at home. That is around 600 or 700 chargers already installed at people's houses. There are other opportunities to share those chargers, community charging, which is an untapped opportunity. People are developing systems so that you can share payment. There are other low-tech solutions such as gullies, which should also be looked at. That is potentially legislation trying to reduce the planning required for that. Ian has talked about the red tape for the DC chargers. There is also a lot of red tape for local charging, so that is important. Then there is this idea of local charging hubs, which is the idea of the petrol station in your local area. Those are also developing.

As Ian said, there is not just one solution. There are different solutions, depending on the environment. In London, the rollout of on-street chargers has been pretty significant. They have 10,000 on-street chargers across the capital, but more needs to be done.

Lord Whitty: The VAT point?

Melanie Shufflebotham: Yes, the VAT point.

Steve Gooding: I would endorse that. I think the point you are making is completely valid. The work we published with Field Dynamics back in 2021 showed a couple of interesting things. First, roughly 60% of us with property might have the capacity to have off-street charging. However, some of that capacity is currently occupied by a garden shed or a greenhouse or has a fence. It is not straightforward. A lot of us will want to charge at a public charge point.

Secondly, we could find no correlation between wealth, household income and the availability of off-street parking. Some of the most expensive houses in the country have no off-street parking in London.

Lord Whitty: We were talking about houses in Pimlico, Suffolk and places like that, where I live.

Steve Gooding: Indeed, some of the people in those houses are the ones who are most likely to buy new cars. The Government need to think about that as well. Maybe one of the things to think about here—in addition to why on earth the amount of VAT I pay should depend on whether I have off-street parking, which does seem a bit absurd—is the location. Convenience is fabulous, but convenience might be part of the

price we pay for having a more extensive public charging network and the ability to always be able to park in front of my house if I do not have off-street parking and am perhaps not used to being able to park in exactly the same spot every day. If that means that we need more lamp post-type charges across more of the street, as has happened in London—to pick up your point—not necessarily all of which will be used every night, that will give me that sense of convenience that I would otherwise lack. That is where the Government need to be thinking.

I agree with Melanie that there is no universal solution. This is a strategy that will require working with the local highway authorities, which have the best picture of where the best locations will be—as well as working with the companies, of course.

Jonathan Marshall: The issue of off-street parking will become much more important than I think most people put their attention to. If you look beyond the issue of driving, when the Climate Change Committee did its big estimate of the costs of the whole net zero transition—that was a few years ago, so it will be out of date now—it found that it was £1.3 trillion total investment, and £1.1 trillion will be paid back through the lower running costs of various green technologies in future decades. The vast majority of this cheaper running cost was through cheaper driving.

That means that, although the countrywide figure nets out at something that is not too scary over decades, if you cannot access cheap charging at home, even if you have an electric car and you are forced into using charge points that are potentially not much cheaper than a petrol or diesel car, your personal household contribution to the overall net zero transition will be so much higher than someone who drives a lot. If the deal that is being made with the public is to spend a bit on insulating your house, a bit on a heat pump, a bit on something else, and then overall it will be cheaper, if the main driver of that being cheaper is driving your electric car around and charging it for pennies at home and that is not an option, that puts some people at a huge disadvantage.

Less than a fifth of owner-occupiers cannot charge at home. Most people who own their own homes have off-street parking. That rises to about half of households that privately rent, and up to about three-quarters of those who rent from the local authority. These are big distributional concerns. It is not just how much it costs you to drive to the shops or to work, but how much of the thousands of pounds of outlay over decades will be recouped.

Dr Russell Fowler: Putting a few threads together, from a network perspective the two future scenarios laid out there are very different. The network solutions for lots of on-street chargers are very different from lots of rapid charging hubs. It goes back to the point that having a plan and a strategy is key for network planning ability if you want certainty and to deliver on those timeframes to do it, and if you do not want to come across any additional issues.

Having available data for grid operations is also key, so that we can see what consumer behaviours are. People talk about new technology. Do we really know how people will use street chargers and rapid charging hubs? When will they come in? Where will the peak be? That data is valuable for network businesses so that we can see what the future demand profiles will be and can be helped to manage the grid in a more economic and efficient way.

Q39 **Baroness Jones of Whitchurch:** I want to return to the grid capacity. I know we have touched on this for a while now. My understanding is that we had peak electricity use back in 2002, and since then we have become more efficient. National Grid has said that. Then it went on to say that, even if we all switched to EVs overnight, we would still potentially have the capacity, because overall usage would go down.

Russell, give us a better sense of the planning of all this. We are heading towards 2035. It is not just electric vehicles that will make new demands on the system. We have already talked about signals and all those pressures, and heat pumps have been mentioned. Suddenly, there is a whole lot of new technology, which all requires electricity. Are you sure, even with that capacity, that when we have all these extra demands you are able to meet that 2035 deadline?

Dr Russell Fowler: You are right about the peak on the system. I think what gives us confidence—I will focus on electric vehicles and heat pumps—is the behaviour we see from consumers around smart charging. At the moment, most people are charging their cars at home when they can overnight, so they are not putting that load on when there is already a peak load. We are seeing lots of initiatives to support consumers away from that, such as smarter tariffs and more dynamic versions of the existing Economy 7. The system operator put in the demand flexibility service over the winter to give people signals to move demand away from certain times. If you have a large load and you put your car in, there is a financial signal now for you to move that away. On that we are confident.

Heat pumps are interesting, because we are a little less certain about the direction of where heating will go at the moment. When we look at road domestic transport, the market has chosen electric vehicles. There is still a bit of uncertainty in the world of heating and what that will look like, and the timelines for them are slightly less certain at the moment. We have the 2030 date band for vehicles. There is less certainty for heat, which needs to be worked through to try to say what that will look like from a grid perspective.

On the other side is where you want to see your large buildout of supply start to match the demand. Demand will increase. We believe that you will see demand start to pick up from the end of this decade. Demand has already been falling since between 2002 to 2006, and at the end of this decade it will bottom out and then start to tick back up again. That is where you start to see your build programme. Your 2030 ambitions for offshore wind, for example, start to get that, but you then need the market to help to support that flexibility, with batteries, for example,

understanding how people will use heat pumps in the system, making sure that homes are efficient and using heat pumps as efficiently as we can. Lots of things need to happen, but if you can get all those bits and pieces together, you can be confident that you will be able to deliver that.

Baroness Jones of Whitchurch: You are confident that, from what you know so far, with technology changes you can meet that deadline?

Dr Russell Fowler: We are confident because of what is in place, yes.

Q40 **Baroness Jones of Whitchurch:** I have a second question. We have also been exploring this “first come, first served” issue and so on, and the issue of prioritisation for grid connections. Is there a better way of doing that? I can see how government trying to say, “Let’s give priority to X group and not Y group”, will not go down very well. Is there a simple way of doing that that you feel would make more sense?

Dr Russell Fowler: I welcome other members’ comments. When you look at the number of people in the queue, does everyone have a valid project, or are you in the queue with a more speculative project? That is the first thing to do: make sure that the people who are in the pipeline definitely have a project that they will take forward and that has finance behind it. You could get rid of people from the pipeline in that way.

On your point about prioritisation, that is where it becomes a little more difficult. We cannot decide unilaterally. Our licence is non-discriminatory; anyone who meets the criteria comes in. Again, it would need regulatory and political support to do that.

To your point about who would be prioritised, again, it is a political situation. A strategic mega-project, something that is so large and so crucial that everyone will agree to it, can, through delegation, be taken to the front of the queue, but obviously that is a difficult process. You want that to be a bit more formalised. Of course, you can make that process a bit more efficient. That can be co-ordinated so that all the different distribution networks have the same approach. I will not go back to the planning point that we have touched on, but we need to make sure those planning initiatives work better together so that we can do that.

Can you use technology to make things a bit better? One of the things National Grid looks at is whether we can use AI to plan where we have an outage for the system. If you are building a grid, you have to turn that part of the grid off because of electricity. Can we be cleverer about how we plan outages and get that to be more efficient? There is learning and innovation that we can put in there. There are things that we can do to get that down, but that prioritisation is almost a political question, I would say.

Ian Johnston: We would love to see prioritisation, but it is worth saying that, in a to-do list of quick wins that would make a difference, standardisation is a quicker win and would make a bigger difference for us today. At the latest count, there are around 48,000 public chargers in the UK today, and around the same number are being developed at the

moment, just among ChargeUK members. We all want to see those made live as soon as possible. It is the variation in processes within different DNO regions and different planning regions that mean that we are losing months and months. Achieving standardisation with planning, highways and DNO regions would make a significant difference.

We talk with some fantastic local authority leaders who are very committed to net zero projects, but when you get down to a departmental level, working with planning officers and those dealing with change of use of parking, from their perspective the workload is the workload. Prioritisation would make a big difference, but I want to make it clear that there are some simple changes on the ground that we could make that would unlock thousands of projects today.

Steve Gooding: I would hate to say that the solution to any problem was a committee. However, some of us think that the Electric Vehicle Energy Taskforce, which brought together industries that had not traditionally had to work together—the electricity world and the automotive world—was a good move. I think some of us feel its loss and that maybe some version of that needs to be recreated to bring together the different parties that have not traditionally had to be involved with each other. A ministerially driven version of that might pick up some of these points about the need for standardisation. If that is what we need, let us get on and do it.

Q41 **Lord Duncan of Springbank:** I have a question that is written down here, but I will not ask it. I have a different question. The Government secure revenue from vehicle owners, and that will need to continue in some form or other. When will we get to the stage when we see taxation or duty placed upon electric vehicles in such a way that it can actually replace that which is on the traditional current fleet of vehicles? What will that look like as an incentive or disincentive for future car owners?

Jonathan Marshall: We have done some modelling at the Resolution Foundation based on current market trajectories of electric vehicles. We estimate that there will be a black hole in fuel duty of around £9 billion per year by the end of this decade, which is getting on for a third of the total that this tax raises.

On top of that, without further changes to the vehicle excise duty regime, there will be loss of revenue. Other than from new vehicles, there have been efforts to make electric vehicles pay subsequent-year VED, but there is undoubtedly a huge fiscal issue coming from a lack of vehicle taxation, which needs to be filled for a number of reasons. First, that is money that is apportioned to be spent on things that the Government spend their money on. Also, without a way of putting that cost on to driving, congestion in the UK will get even worse. Third is the shifting shape of the tax burden. If you can extricate yourself from fuel duty by buying an electric car, the burden of that tax falls on those who cannot do so, and that will be those on lower incomes who will pay more tax to get around than those who have chosen not to pay that tax.

The longer this situation goes on, the more electric vehicles will be on the road, the harder the discussion will be with people who have bought an electric car assuming that it will be for ever untaxed, the bigger the black hole will be, the higher the potential rate of whatever replaces fuel duty, be that per mile charging or some sort of paying to use the roads. It is a situation that needs to be faced up with fairly soon. Obviously, it is a difficult conversation to be had with many drivers, but the longer it goes, the less sustainable it seems to be getting.

Melanie Shufflebotham: If I could put my perspective on that, as I said right at the beginning, only 4% of cars are electric at the moment. Even by 2030, only 30% of cars will be. Clearly, there will be a tax hole, but we have to think about the bigger picture. We are trying to use tax to incentivise people to get electric cars so that we can reduce carbon and improve air quality. That is why we have the tax regime. We already have the VED coming in 2025, but we need to keep going with the salary sacrifice and the BIK rates to encourage people to shift over. We are not yet at the point where we can take those policies away. I think that in the medium term we will move to some kind of road pricing and that, at some point in the future, we will start taxing cars. The heavier electric cars we will start taxing in a different way, but in the short term we need to use tax to incentivise people to make the shift.

Lord Duncan of Springbank: How short is the short term?

Melanie Shufflebotham: To me, it is until 2030. At 2030, you need to start taxing the very big petrol and diesel cars even more heavily to encourage people to shift over. I understand your point about low income, but there are a lot of big cars out there that could be taxed heavily.

Lord Duncan of Springbank: If we are talking about those who are very hard to move in this direction, and we are talking about them being the elderly and the poor, would you not just be suggesting taxing the elderly and the poor more heavily?

Melanie Shufflebotham: In 2030, 70% of drivers will not have electric cars, and a large portion of those will not be the elderly and the poor. Yes, we need to protect the elderly and the poor, but there will be a chunk of people who are reluctant to move, and we need to use tax to help them move.

Steve Gooding: There are two things that need to come together. I am not sure what year it will be, but one of them will be the need, at the right point in the electoral cycle, to make what could be quite a controversial announcement. Secondly, the announcement has to be a package. If we just think about the tax angle specifically in relation to electric cars, I do not think we will ever get there. I cannot imagine the circumstances in which, as a former civil servant, I would be greeted in the room by a Chancellor when I went in to tell him, "Good news. We're going to introduce this new charge, Chancellor". It has to be part of a package, and it is at the point when that package has been developed

that has a sufficient political attractiveness and electoral attractiveness. I suspect that will be associated with the 2030 date, but I would not like to bet my own money on whether that is just before it or just after it.

The Chair: Thank you. We have finished almost spot on the dot, which is excellent. We have had a large panel today, so that is a credit to the brevity in some areas that you have given us the evidence, but you have kept it short. Thank you for that. I would like to formally thank you all for attending and my colleagues for the questions. Thank you.