

Business, Energy and Industrial Strategy Committee

Oral evidence: Electric Vehicles: Developing the market and infrastructure, HC 383

Wednesday 14 March 2018

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Watch the meeting

Members present: Rachel Reeves (Chair); Vernon Coaker; Mr Ian Liddell-Grainger; Stephen Kerr; Peter Kyle; Mark Pawsey; Antoinette Sandbach; Anna Turley.

Questions 77 - 136

Witnesses

I: Des Quinn, National Officer, Unite the Union; David Wong, Senior Technology and Innovation Manager, SMMT.

Examination of witnesses

Witnesses: Des Quinn and David Wong.

Chair: Thank you very much for coming to give evidence to the Select Committee this morning on electric vehicles. This is the second evidence session as part of this inquiry and we appreciate your time this morning. We have quite a lot to get through and parliamentary business starts in an hour, so we are going to try to get through this session within the next hour. I will start with Antoinette Sandbach.

Q77 **Antoinette Sandbach:** As the Chair has said, I am afraid short, sharp answers will be needed to my questions. What do you see as the biggest challenges for electric vehicle production in the UK?

David Wong: In terms of production, it is very difficult to say there is one major challenge. There are a number of interlinked challenges. If I could put it this way, hopefully as shortly and sharply as possible, the first challenge is basically on the technology side or what the industrial strategy automotive sector do with ideas. It is basically looking at technology, not least battery technology, and how we can achieve greater range from innovation and technology to bring the costs of battery production down, as well as to increase a range of vehicles. Technology is one.

The second challenge is infrastructure. It is all interrelated because there is infrastructure related to the take-up, i.e. the market having the right connectors—charging connectors and not just charge points—in the right places. It is not about ever more connectors, because we have about 15,000 connectors, which is among the highest in Europe already, but the right connectors in the right places.

The other part of infrastructure is the industrial infrastructure. For example, one vehicle manufacturer has decided to manufacture its first electric car in Austria rather than in the UK. There are many reasons. One of the major reasons is because, quite perversely, there was not enough power in the place where they manufacture the vehicles. Infrastructure is the second challenge. The third one is, broadly, business environment and skills. This is also addressed in the industrial strategy but, broadly speaking, if we look at skills, for example, we are very much in the transition of bringing people from manufacturing combustion engines to electric vehicle components. The business environment needs a policy that is supportive, and industry is working together with Government on the industrial strategy front. Can I say something else very quickly?

Q78 **Antoinette Sandbach:** I have three other questions and I only have five minutes to both ask them and get the answers. Do you agree with that, Mr Quinn?

Des Quinn: Very much so. It is very important that that is delivered through public investment, universities and the private sector.



Q79 Antoinette Sandbach: Can I ask you, in relation to that, to what extent the automotive sector deal addresses the challenges that you see facing the industry?

Des Quinn: It is a good start, especially the £500 million—or up to £500 million—that was put aside in the last Budget, but it goes nowhere near catching up to the £6 billion that Obama put into America, and it gets us nowhere near what is happening in China or Germany, whether it be investment in the research and design, or whether it is the infrastructure or reskilling people.

Q80 Antoinette Sandbach: Do you accept that we may have different financial constraints here than in those other comparators?

Des Quinn: We may well have different financial constraints but we also have to decide how important the industry is to us. Eight out of every 10 cars we build in the premium sector, where we are very good and where we play—if we want to maintain our place at the head of that, we have to be able to invest in that or we are going to fall further behind, lose the business and lost those well-paid jobs and skills.

Q81 Antoinette Sandbach: Mr Wong, to what extent do you think the automotive sector deal addresses the challenges?

David Wong: The Government have rightly prioritised the sector-specific deal. It is absolutely right to develop this deal in conjunction with the industry. Our understanding is that the sector deal is very much a live document, so to speak, in the sense that it keeps evolving. Ultimately, the strategy must be commensurate with ambition. At the moment, we think it very important for the UK to develop the supply chain and make it a really integral part of the sector deal. We are supportive of the sector deal. We look forward to working with Government to further expand it, to grow it, particularly beyond what has been committed to at the moment and the flagship £246 million Faraday challenge, which we support.

Q82 Antoinette Sandbach: In terms of improving the sector deal, you say there needs to be a greater focus on supply chain and it needs to be a continuing, evolving document.

David Wong: Yes, it is. The sector deal itself is a live document.

Q83 Antoinette Sandbach: Mr Quinn, you would argue that it needs more money behind it.

Des Quinn: Yes, but I do not think it is just the money; it is the plan all the way through from the research, design, the manufacture, the supply chain and even after sales and what we do with the batteries at the end.

Chair: We are going to come to that. That is a good point.

Q84 Antoinette Sandbach: In terms of the phase-out date for conventional petrol and diesel vehicles, if that was brought forward to 2030, what support would manufacturers need to ramp up their EV production in



time?

Des Quinn: That is probably a false deadline. I do not know that 2040 is even right. There is a place for internal combustion, especially clean diesel, rather than the old diesel engines; there needs to be a proper grown-up debate about it. It would be a mistake to do that, to bring that forward to 2030, and if we did want to have the ambition to do that, all of the things we have mentioned already would need to be done.

David Wong: If I may point out, the 2040 policy is on the market side, not on the industrial side—ending the sale of conventional petrol and diesel engine vehicles. That is very much dependent on how quickly industry and Government can work together to overcome what we call the three “A” challenges that are holding back the market. The first A is product affordability; the second A is range anxiety; the third A is infrastructure accessibility. They are all interlinked. It very much depends on that.

Q85 **Mark Pawsey:** You started to speak about the supply chain. On Monday, the Committee visited the London Electric Vehicle Company, which is in my constituency, where we learnt that the local content was about 40%. I know that in France and Germany figures on electric vehicles are looking at 60%. I think the sector deal is looking to increase local content to 50%. What could we do more? Where do we need to focus our activity in getting more out of the manufacture of electric vehicles?

David Wong: What we need to do is basically look at two important overarching concepts: competitive advantage and comparative advantage. Most of the time when we look at developing strategies, we are overly focused on competitive advantage and thinking that perhaps if we focus on certain things, we may achieve competitive advantage. We are quite myopic to comparative advantage. What we need to do in order to beef up our manufacturing capabilities is look at what we are good at and where there is the highest value based on what we are good at. At the moment, if you look at the cost of producing electric vehicles, almost half of it comes from the battery. Does that mean we have to dive big-time into batteries?

I would suggest that we look and break it down into which part of the battery development design and manufacturing we are good at and where the highest value is. It is probably not in assembly of the cells but in design and management of the cells: for example, electrolyte manufacturing. That is where we should concentrate and it is where we have capabilities. Other areas are, for example, traction motors and lightweight materials where we have capabilities. We should concentrate on these, as well as power electronics. We can source the lower-value components from elsewhere, probably at a more effective and efficient scale.

Q86 **Mark Pawsey:** Mr Quinn, I know Unite the Union have done some work on batteries and Mr Wong has corrected me there that a very substantial



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proportion, almost half of the cost, of the electrical vehicle is in the battery. Are we doing enough to get involved in battery technology? Interestingly, I think one of the BEIS questions yesterday was from a Cornish MP who drew attention to the reserve and base metal being available in Cornwall. Should we be pursuing those angles more?

Des Quinn: I do not know that we should necessarily be talking about us extracting the materials because they are in Cornwall. I am guessing he was talking about lithium. A majority of the cobalt comes from Africa, southern Asia and the Democratic Republic of the Congo. I do not think that is necessarily our aim. Maybe not the cells, but putting the arrays into the battery packs is something we should be doing locally because the battery packs are going to be large, heavy objects that you are not going to move very far. We need plenty of those. In terms of the technology going into it, I do not think we are doing enough. As I said before, we are behind China and America and we should be doing more in that field.

Q87 **Mark Pawsey:** Have we got the skills to do that? Do we have the technical expertise if we decide we are going to put more effort into battery technology?

Des Quinn: No, but that should be part of the plan. We are getting there and we should be playing catch-up on a quicker scale with the countries that are doing it. If you look at Germany, for argument's sake, not just on batteries but in terms of what they are doing for the whole electrification and connectivity of the car, they are training apprentices at a greater number than what the OEMs need. They are doing that so they can flood them back into the supply chain. Anywhere we identify the skills shortage, that is what we should be looking to do, so that we are not just developing the skills to develop things but also to build and maintain them going forward.

Q88 **Mark Pawsey:** The Government have provided some funding for investment in battery technology in Coventry. Can you tell us a little about that and is that enough? Should we be doing more?

Des Quinn: Yes. We need to be doing more. That is in conjunction with the Warwick Manufacturing Group. It is a great start. The Faraday challenge is split into different parts, as I understand it. That is only one element of it. Other elements are things like looking at how we move that into production and how we put the production systems in place. Yes, it is good. It is welcome but we can always be doing more.

Q89 **Vernon Coaker:** Can I ask a bit about investment decisions? First of all, can I declare I am a member of Unite and refer to my entry in the register of Members' interests with respect to that as well? In asking about this, it is quite astonishing that the headline figure is that the investment in the UK automotive sector stalled in 2016. It dropped by a third, to £1.6 billion, down from £2.5 billion in 2015. You can blame that on Brexit and so on, but how is the UK policy environment for investors in



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electric supply compared to the opportunities internationally? Notwithstanding Brexit, that is a huge drop in investment coming into the UK. What is happening elsewhere that is attracting that investment, rather than what we are doing here?

Des Quinn: I am guessing Brexit is the biggest part of that.

Vernon Coaker: There are other reasons, I suppose.

Des Quinn: There will be other reasons. I would imagine it is because other businesses or other countries are seen as moving further forward, and it is seen as an easier option perhaps to buy the technology. Perhaps an example of that is Alexander Dennis; they were developing their own battery technology and have now teamed up with a Chinese company; they are bringing chassis cabs in or chassis in with batteries built into them. Sometimes it is easier to go and buy the solution than invest the money into it. Again, a lot of that comes back to concerns about what the future looks like, what support we have had here and how far we have fallen behind the rest of the world.

Q90 **Vernon Coaker:** Is it a lack of ambition?

Des Quinn: Yes, I think so.

David Wong: If I may add to the figures you quoted just now, in 2017, just last year, the investment was just £1.1 billion. That is a further fall of 33.7%.

Q91 **Vernon Coaker:** Sorry, just to make sure I understood you correctly, the figures I quoted were £2.5 billion in 2015 and £1.6 billion in 2016. What are you now saying for 2017?

David Wong: £1.1. billion. A further drop of 33.7%.

Q92 **Vernon Coaker:** You say the main reason, as Mr Quinn did, is Brexit.

David Wong: It is business confidence, which is partly related to Brexit, but also to do with some of the confusing messages coming from Government, bearing in mind that the investment is for automotive as a whole; it is not just for electric vehicles.

Q93 **Vernon Coaker:** It is a massive drop though, is it not? Whatever the reason, it is a big drop.

David Wong: Yes.

Q94 **Vernon Coaker:** You are saying, to mitigate that, some clarity around policy would help to generate confidence?

David Wong: Indeed.

Q95 **Vernon Coaker:** What would that be?

David Wong: Clarity, both on the industrial side and especially on the market side. That includes clarity, for example, on the Government's Road to Zero strategy; we are waiting for the publication of that with



baited breath. That also includes clarity regarding long-term plans for investment. For example, the Faraday challenge is a step in the right direction. The industrial strategy and automotive sector deals are steps in the right direction, but we probably need to be thinking about what is next on that, all the way through to 2040 and 2050, because on the technology side, the Automotive Council, Government and industry are working together. We have mid to long-term technology roadmaps. What we need now is an industrial plan. Thankfully, the industrial strategy is a live document so it keeps evolving, which is great, but we need a longer-term plan for the industrial side and the market side to support the technology roadmaps.

- Q96 **Vernon Coaker:** If I understood right, from your answer to Antoinette Sandbach, one of the ways you can do that is by setting targets. There is a target of 2040 for phasing out new conventional petrol and diesel vehicles. Do you agree with that or not? I was not quite sure. Do you agree with that as a target? Do you think it is a good target, a bad target or not ambitious enough? Should it be 2030 or 2025? Is it ridiculous to set a target? What do you think?

David Wong: Let us put it this way: the automotive industry's vision of the future is very much ACES—"ACES go places", if you like. ACES stands for "autonomous, connected, electrified and shared". Electrification is very much a key feature of the future.

- Q97 **Vernon Coaker:** Does the target goal achieve that? That is the fundamental, is it not? Is saying in 2040 you are going to do this and in 2050 you are going to get rid of the whole lot a good thing or a bad thing?

David Wong: It focuses industry but whether it is a good or bad thing very much depends on what I mentioned just now: the fulfilment of other facilitating conditions, the three As in particular. If the three As are all lined up in a row then 2040 is very achievable, but if any of the three As are probably not achievable, then 2040 is quite difficult.

- Q98 **Vernon Coaker:** There are 169,000 people who work directly in the industry, if the figures I have are right, and 814,000 work in associated industries. What is a just transition? All those workers and people involved are doing X, Y and Z in places all over the country. There will be many people employed in all of our constituencies supporting that. How do we move from where we are to where we want to be, and how do we ensure that people are retrained, reskilled with investment, et cetera?

Des Quinn: One of the things we have to do, first of all, is have a debate about whether there is clarity to the public about stuff we have now, such as petrol and diesel. It has a huge part to play in reducing emissions. As we improve things like that, it will allow manufacturers, instead of having to move perhaps from one technology, such as diesel at the moment, where they are still investing a lot of money, to another. It will give us time to talk about a flight path for going from one to the other. It will



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also give us time to put policy together to make sure that we retrain and reskill people to do a seamless transfer from one technology to the other. At the moment, we are sending confusing messages. People may not be buying electric cars because they cannot afford them at the moment, but that will change as prices come down and we will have, instead of a seamless transition from one to the other, people jumping from one to the other. We will not have the skills or infrastructure in place to support doing that.

Q99 Vernon Coaker: Mr Wong, do you agree with that? Is it just transition? How do you see it? As manufacturers, you will be concerned about skills and so on, and a just transition.

David Wong: At the risk of repeating myself, the three As are very critical to the transition on the market side. On the industrial side, really it is about the business environment and the skills that I mentioned just now, but also very much looking at how we can set up a long-term plan to slowly transition from some of the things that we are really good at at the moment. For example, we produce 2.7 million engines per annum. A million of them are diesel engines. 1.7 million are petrol engines. 54.7% are destined for exports. We employ about 8,000 people in engine production. How can we slowly transition this? We need a plan. Industry and Government need to work together. We think this is something that the industrial strategy can further spell out.

Q100 Vernon Coaker: To finish, the policy needs to be clarified.

David Wong: Absolutely.

Q101 Vernon Coaker: Is the policy to drive towards the elimination of diesel, petrol and internal combustion, towards electric vehicles, the right policy to pursue, even though it will be difficult and there will be bumps in the road? Is the policy objective right?

Des Quinn: There will always be a need for some sort of internal combustion, perhaps only in larger trucks at this stage. Again, that may change as we move forward with the technology and we see battery distance and the range anxiety reduced. At the moment, I would say there is a place for internal combustion. I am not saying that I may be saying that in the next few years.

Vernon Coaker: The jury is out at the moment.

Des Quinn: Yes.

David Wong: The 2040 policy is to end the sale of conventional petrol and diesel engines. It does not mean that internal combustion engines will be gone because in hybrids, electric motors and, for example, a petrol engine, it does include an internal combustion engine.

Q102 Vernon Coaker: That is an interesting point to put to the Ministers about what they actually mean by getting rid of the internal combustion engine. Your reading of the policy is that it is not a total elimination of the



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internal combustion engine. It is a hybrid.

David Wong: Those are the headlines you tend to get but it actually would be important to delve into the content of the policy.

Q103 **Vernon Coaker:** What about 2050? That seems to be total.

David Wong: For 2050 the policy is basically for the entire vehicle fleet; 2040 would be new vehicles.

Q104 **Vernon Coaker:** Is it the same point for 2050 as 2040?

David Wong: Yes. It is conventional petrol and diesel engines.

Vernon Coaker: It would be worth clarifying that from the Minister.

Q105 **Chair:** It is an interesting point. Regardless of what the Government say, do you think that by 2050 we will still need the traditional combustion engine in a car, or do you think the range will have extended sufficiently?

David Wong: It very much depends on two things: the three As and the consumer. For example—and I caution that I am talking hypothetically—if batteries have a range that is equivalent to an internal combustion engine vehicle today and we have a charging infrastructure of different types and the right type ubiquitous in the right places, and these products are affordable, people will be more convinced.

Q106 **Chair:** You know the industry well and you know consumers well as well, Mr Wong. Regardless of government policy, by 2050 do you think we will get to that stage where the internal combustion engine will become obsolete?

David Wong: It is very difficult to say regardless of government policy, because this is essentially a partnership between industry and Government. For example, if you want to put in charging infrastructure, it is impossible that the private sector or industry can do it alone. It has to be industry and Government working together. That is why we have the Automotive Council.

Q107 **Chair:** Have you got anything you want to add to that?

Des Quinn: Sustainability is something we have to talk about as well. At the moment, we see batteries in computers and phones and things like that, and they tend to be thrown away. Probably the majority of them end up being in landfill. That is something we need to look at and develop industry for going forward as well, because these batteries can be reused.

Chair: We are going to come on to recycling. I know you are doing some work on that.

Des Quinn: The environmental impact could become as big an issue if we do not get the back end of this right as we are trying to eliminate the front end.

Q108 **Peter Kyle:** You both mentioned skills quite a bit. Mr Quinn, perhaps you



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can tell us precisely what new skills are needed in order to sell, maintain and repair electric that are not there for internal combustion?

Des Quinn: It will be your scientist type research roles, first and foremost, and then it will be your electrical and manufacturing skills that we have today, but they will be more in those fields as opposed to some of the things that we train industry for now, which is maintenance of plant.

Q109 **Peter Kyle:** Are they transferrable skills at the moment? Do you think the same people could be retrained?

Des Quinn: People could be upskilled. All the way through manufacturing in terms of the OEM and the supply chain, people can be upskilled and it should be a priority.

Q110 **Peter Kyle:** Do you see the development in programmes at the moment that could deliver this kind of upskilling?

Des Quinn: Yes, I do not see any reason why not.

Q111 **Peter Kyle:** You do not think that the upskilling and the adaptation of skills is a major problem? It is something that is not insurmountable?

Des Quinn: It is not insurmountable. First and foremost, what we need to do is identify what those skills are. The people on the research, development and manufacturing side have to highlight to us exactly what those are. It is not something that is insurmountable but it is something we need to be serious about. Like I said, we should not look and say, "What do we need to develop it? What do we need to build it? What do we need to put it in a car?" We need to look at what we need to do to get it right all the way through, even down to aftermarket in particular.

At the moment, some of the first electric batteries are coming out of cars and we have untrained mechanics taking those out. There is no level of responsibility in terms of training that they should have. We are seeing accidents now where people are burning themselves, working on high-voltage batteries. The IMI has a policy on this that there should be regulation on the level of training before you can do certain things to a car; that should be something that is measurable across not just the UK but with other countries

Q112 **Peter Kyle:** Are manufacturers on top of this, or do you think Government need to get involved?

Des Quinn: Government need to get involved. Manufacturers will. Manufacturers will make sure if you buy a car from them and you take it back to a franchise garage to be repaired, to have the battery replaced or to be serviced, they will make sure the skills are there for those. However, in the wider aftermarket industry, we need to make sure there is regulation to make sure the right skills are there, not just in terms of being able to work on the car but for things like health and safety as well.

Q113 **Peter Kyle:** You think Government's role is mostly a regulatory one. It is



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not actually frontline, hands-on training.

Des Quinn: It is not frontline, hands-on training but there needs to be government policy that delivers what the developers and manufacturers say we need.

Q114 **Peter Kyle:** Mr Wong, we did a visit earlier this week. We went to Milton Keynes, to the Electric Vehicle Experience, and then to Coventry. We had the opportunity to drive some of these electric cars. The thing that I was most struck by was how the experience of driving electric vehicles is a very different one, and in many ways, a much more rewarding one. It was an exhilarating one. Every time I speak to somebody about electric cars, the first thing they ask is a variation of, "Is it as good as a petrol car?" Do you think we are capping expectations on electric vehicles as, "Are they as good as petrol vehicles", and the industry at the moment is not selling it as being better?

For example, it is a smoother ride because you can do most of the driving with the accelerator pedal. You do not need the brake very often. It is a fundamentally quieter experience. There are a lot of things you can do with the electricity, like pre-heating the car and getting it ready for you in the morning and things, which you cannot do with petrol without belching out fumes. Why is this industry not being sold as the better experience rather than just a replacement experience?

David Wong: First and foremost, I am glad you found the experience really enriching and you had a pleasant experience test-driving an electric vehicle. What is good is quite subjective to different people. The thing about electric vehicles is not just about the experience, though experience is a draw; we do talk about experience in a joint-industry and government-funded campaign called the Go Ultra Low, which is targeting consumers and telling them, through a variety of communication channels, how the experience of driving an EV can be very pleasant, rewarding and enriching.

Beside the experience, there is another key issue that people need to be sold on EVs. That is basically the purpose. If you are talking about an electric vehicle, we have to be very careful in understanding whether we are talking about a battery electric vehicle—a pure electric vehicle—or a plug-in hybrid or a fuel cell. At the moment, the mainstream vehicles of these types can do a different range. What is quite important is to look at people's needs. Some of them may need to do longer journeys. Therefore, for them, if we were talking about electric vehicles, the plug-in hybrid may be a good one, or the fuel cell perhaps. A lot of people are still driving diesels on the motorway because that serves a real, tangible purpose for them. A lot of people are also using electric vehicles in, for example, cities and urban areas, particularly if they are doing, more or less, 27 to 35 miles a day.

Q115 **Stephen Kerr:** I heard you talk about batteries already. It is a big issue. How realistic is it for the UK to forge a role as a world leader in battery



technology, David?

David Wong: It comes back to what I said earlier. When we talk about battery technology, we must not take it as a catch-all, because there are different facets of battery technology. I will give you an example. Recently, a member of ours—they are not British and are a large player in the global supply chain—have decided not to dip their toes in battery cell manufacturing, because they believe they can be an important player without having to manufacture the battery cells themselves. The higher value-added bit is in the system design as well as in electric manufacturing. It is in the design and development of the batteries. That is where they decided they would concentrate.

Similarly, for the UK, like it or not, we are, to a large extent, playing catch-up. Who are the world leaders in battery manufacturing? It is the Asians, because they can do it at a better price and better quality: the Panasonics, Samsungs and LGs of this world. Do we want to play catch-up in that particular area of manufacturing cells, or do we want to carve out a niche where we are really good, coming back to what I mentioned just now, in this upstream bit—the design and development of the cells, the electrodes and the system itself?

Q116 **Stephen Kerr:** When you talk about the thing we are really good at, are you talking about things like solid-state batteries? There is the kind of research being done currently that is going to transform it. Is that what you are referring to?

David Wong: Solid-state is one part of it, because that is a step-change. That is the next generation. By and large, at the moment, we are talking about lithium iron. In the future, the near future, it will still be lithium iron. If there is a breakthrough in solid-state or metal-air—

Q117 **Stephen Kerr:** Is solid-state something we could take a lead in?

David Wong: We certainly could. It does not take much for me to imagine we have some capabilities because there is one particular company that is not an automotive player that is already researching big-time into solid-state.

Stephen Kerr: Dyson. They have made it huge.

David Wong: There are some capabilities there in solid-state, but not only solid-state, because it would not be wise to put all our eggs in one basket. As I say, it could also be metal oxygen—for example, lithium air.

Q118 **Stephen Kerr:** Des, can I hear your views on the same subject? Is it realistic?

Des Quinn: Yes, we could be market leaders in the research and development. Most certainly we are very good at it, where we do it now. I agree that the manufacturing of the cells is not necessarily something we should be hung up on, but there is no reason why we cannot add as much value to the cycle as possible.



Q119 **Stephen Kerr:** To what extent is the UK industrial base—the science and manufacturing base—at risk from overseas takeovers?

Des Quinn: We have to clarify what our industrial base is. If you look at our biggest manufacturer, Jaguar Land Rover, it is Indian owned. I do not know about “risk of takeover”; takeover has happened. I do not necessarily think that that is a risk. The risk is that, if we do not produce the products that the consumer wants, we are at risk of losing market share and losing the market or industry that way.

Q120 **Stephen Kerr:** David, do you have a view about overseas takeovers, bearing in mind what Des said?

David Wong: The risk is not so much who owns these companies but is really about where the jobs and investments will be, and where the high-value activities will be, rather than who owns these companies.

Stephen Kerr: Who owns is secondary.

David Wong: What we must not do is, for example, lose our IP or, to put it another way, fail to capitalise on our IP. We, the British, invented lithium iron technology in 1979—John Goodenough at Oxford University. It has been taken over by the Asians.

Q121 **Stephen Kerr:** We are pretty poor at commercialisation, are we not? Can we turn briefly to autonomous vehicles? Again, the Government has a stated view on Britain becoming a recognised world leader in that area. David, what is your view of that?

David Wong: It depends where we want to be a world leader. In connecting autonomous vehicles, we can play in one or a combination of these three areas: design, development and manufacturing; testing and validation; and end deployment. Again, it depends on an assessment of where we are good and what we want to be leaders in. For example, the Government have set out their stall, backed by serious money, to create a UK testing and validation ecosystem for autonomous vehicles—£100 million for this, match-funded by industry. That is a step in the right direction.

At the same time, we are also looking at, as the Secretary of State for Transport announced last November, deploying the first autonomous vehicles on our roads in our market in 2021. Therefore, the Automated and Electric Vehicles Bill going through Parliament at the moment is to prepare the market, from an insurance perspective, so that we can be among the first in the world to deploy. That is the right ambition and a step in the right direction.

Q122 **Stephen Kerr:** Is there anything the Government should be doing to drive the innovative edge?

David Wong: Yes, absolutely. We have to look at areas where we have powers within national regulation to enable regulatory reform to take place at higher pace. To give you an example, level 3 is a Society of



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Automotive Engineers definition. It is basically conditional automation, where you can hand control through the system in limited circumstances in limited-use cases. The world's first level 3 vehicle was launched last summer in Barcelona. It was manufactured by a German manufacturer. They aim to bring it to the market later this year, pending the manufacturer's success in obtaining an Article 20 exemption. This is an exemption for innovative technologies that might not have been approved yet.

If they obtain Article 20 exemption, they can deploy it in the home country, which is Germany, to narrow down which manufacturer it was. They have passed traffic laws last May to enable level 3 vehicles to be deployed; we have not. What we have been doing recently is consulting on the Highway Code and the construction and use regulation related to level 2 technologies, i.e. remote-controlled parking and motorway assists. We need to hasten to undertake regulatory reform if we want to be among the earliest markets to deploy new technologies.

Q123 Stephen Kerr: That is very interesting. Des, what do you think about autonomous vehicles and potential world leadership?

Des Quinn: I do not know about world leadership. I think everyone will get there. The software companies and developing the software for them is important but it is also about regulation and making sure that people are comfortable with them. We need to make sure that, rather than be in a rush to be first to the market, we are first to be in the market with a product that people have faith in and that protects people's employment as well. People talk about platoons of lorries going up and down the motorway. How do you get on and off the motorway? Bluetooth does not see a car coming sometimes from the side or the back. Drivers do. We need to make sure that, first of all, there is a level of confidence with it that people can buy in to. The technology has to be there and, rather than be first to the market, we have to make sure that when we get to the market we have got it right and that we are there at the testing stage of it sooner rather than later.

Q124 Stephen Kerr: Is there anything Government should be doing to drive innovation in this area that they are not doing?

Des Quinn: I do not know. It is not something I have great knowledge on, but it is about the regulation and making sure the right regulation is in place for the road-testing of it.

Q125 Anna Turley: I am interested in the end-of-life vehicle. I was struck earlier by a point you made, Mr Quinn, that if we do not get this right some of the environmental implications could undo the purpose behind electric vehicles. At the moment, the industry has a target of 95% of existing vehicles being reused, recycled or recovered, which has already been pushed up from 85%, which is quite a challenging target. There is some concern about electric vehicles: that not all of their components can be recycled currently. With the internal combustion engines, complex



power electronics, battery packs with lithium, there is a quite complex mix. Do you think we are ready for the end of life of these vehicles at the moment and for that level of recycling? What are the challenges that electric vehicles pose to the industry that existing vehicles do not?

Des Quinn: No, we are not ready for it at the moment. If you try to break down the raw-material minerals that go into the battery, we have nothing in this country, as I understand it, that deals with that. It is again a great opportunity to be market leaders in developing how we do that. It is something we have to do. Old batteries are going to be dangerous. Like I say, they will not just go into landfills. We have to develop ways of breaking them down. We have to develop uses for them. As I said earlier, that could be power storage units in houses. It could be using them for other electrical goods going forward because, again as I understand it, while they may not be up to the standard required to drive cars, it will be up to the standard for other things. There is a potential whole other industry coming out the back of this that we have the opportunity to get in on the ground floor on.

David Wong: I will concentrate particularly on the battery packs, because that seems to be the one component that is very different from conventional vehicles. The vehicle is the vehicle. The metal itself—obviously you could recycle and reuse that. Battery packs could continue to have a second life. What they are likely to be used in is in less demanding applications, such as energy storage. There have been trials and projects looking at the possibility of using EV batteries as an energy storage medium in the second life. This would include, for example, using them for PV, solar panel energy storage. It could also be for home energy storage in a conventional way. There are some projects going on.

In fact, we had one of these projects, talking to our members in our electric vehicles group, that is using used batteries from EVs as a grid support mechanism, particularly for rapid charges. If you are looking at particular networks, local networks, they are slightly weak, and if you want to charge the vehicles at 50kW and above, then you need some sort of network reinforcement, or you could use second-life batteries to support the local network. There are some applications. However, the reuse of these complete battery packs is more cost-effective than breaking them down or repurposing these modules because it would be costlier. Frankly, it is technically possible. At the moment, the challenge is looking for the right business model to enable the use of these batteries in some second-line applications.

Q126 **Anna Turley:** How far away are we from that at the moment? Is the industry looking at that? Is the Government looking at that? What steps do we need to take to get ourselves closer to be able to deal with this?

David Wong: There are some private sector initiatives but there are also opportunities that industry and Government can tap into. That is something that the Automotive Council has been looking into. As part and parcel of the Faraday challenge, the Automotive Council has set out the



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entire lifecycle of the battery, from the raw materials all the way through to end of life and recycling. That is certainly an emerging area that we can look into. We just have to be careful of the IP implications, because some of these battery packs have some battery management system IP embedded.

Q127 Anna Turley: Do you agree with that, Mr Quinn? Do you think we should be looking to invest in this now, rather than waiting until we get towards the end of the lifecycle of these cars?

Des Quinn: Yes. Again, it is an opportunity rather than something we should be looking at as a hindrance. It could be a whole future set of technologies and opportunities for the economy.

Q128 Mr Liddell-Grainger: I am fascinated. Following on from what Anna was saying, one of the big problems with batteries is how you recycle batteries. Have we done any work on recycling the batteries within these cars and, if not, what do you do with them? They are built in, are they not? It is not a battery that you simply take out.

Des Quinn: As I understand it, the batteries will be able to be taken out and new batteries put in. There are people that have looked at how you recycle the materials that go into the battery but it is very costly. The separation of the lithium and cobalt is the problem there. It is the price that is restrictive in doing that. It is very difficult to recycle it, other than anything along the lines of what we have mentioned already.

Q129 Mr Liddell-Grainger: Mr Wong, can you recycle these? We have just heard how expensive and difficult they are, with just about every problem you can think of. Where do we go with the technology to understand how we take these things to bits?

David Wong: There has been work looking at how we could extract as much material as possible for re-use, but the technicalities—I put my hands up—are beyond me. I have nothing more to add to what Des has said, apart from repeating what you mentioned just now: it is far more feasible and useful to reuse these packs for the second-life applications, rather than taking them apart, which is a far more costly and time-consuming business model, which is currently uncertain.

Q130 Mr Liddell-Grainger: Nissan and Renault, which have a very close tie-up indeed, with the two companies working very closely, have been looking to do this. Theirs are on the bottom of the cars. They are finding it very hard. They are saying that they may need to put these things in various places to leave them, which is not an ideal situation. Do you think the Government, or we, should be persuading industry or giving them tax breaks to look at the technology we need to decommission these things. Nissan builds a lot of cars in the United Kingdom, Renault not so many. Thinking outside the box slightly, what is the way to do it?

Des Quinn: It is probably something they will want to do themselves because if there is a recycle opportunity or a second-life opportunity, it is



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a commercial opportunity for them. I do not know that we will necessarily need to make them. It is something they will want to do. It will not be their primary focus because it is not their core function.

Q131 Chair: Can I ask about the second-hand market? In our evidence session last week, one of the things that came up was that there was not a very well-developed second-hand market for electric vehicles. Do you think that that will change, Mr Wong? What are the barriers to the development of that market?

David Wong: That will change. That is the simple answer to your question. That will change because, as more electric vehicles come on to the market as first registered cars, over time they will come onto the second-hand market. What is crucial to ensuring that there is a bustling second-hand market is really to create a market for new EVs in the first place. If you think about it, the challenges that a used EV owner will face are not going to be very different from those that a new EV owner will face: affordability, of course, range anxiety and charging accessibility. They are the same challenges that somebody owning an EV for the first time, a new EV, will face.

Q132 Chair: Is there not a difference as well, though, that we do not know about how quickly a battery will deteriorate? Is there an issue that there is a faster depreciation of the value of electric vehicles compared with the traditional ones for that reason?

David Wong: It is difficult to say, simply because we are not at a point where we have enough EVs of that age where they are put in the second-hand market. We do have enough EVs at that age where we can ascertain that the battery has degraded below 80%; 80% is more or less what we deem to be the usable rate of battery in a vehicle.

Q133 Chair: Why? What happens after 80%?

David Wong: You cannot support very demanding applications, hence putting them into second life—for example, home storage and less demanding applications. 80% is not a hard and fast number. That is more or less conventional industry wisdom. What I can say is that there are some EV models that hold their residual values very well but some that depreciate more in the same amount of time or with the same mileage.

Q134 Chair: Do we know enough yet about the technology and the battery deterioration to know what that second-hand market will look like or will we just have to learn as more of these cars come onto the second-hand market?

David Wong: We do not know enough yet but anecdotal evidence from a lot of these consumers, through our Go Ultra Low programme and campaign, is that many of the drivers of the Nissan Leaf, for example, which is the most popular model out there, have not experienced a degradation, even after years of owning the vehicle.



Q135 **Chair:** Do you have anything to add on that, Mr Quinn?

Des Quinn: We need to have a second-hand market for it; otherwise, the people who buy brand new cars will stop buying brand new cars because of the residual value, and we will not get people out of older internal combustion engines. It perhaps comes back to things as simple as, if I am going to buy an electric car, where am I going to plug it in if I live in a high-rise block of flats or a terraced house? What are the practicalities of being able to plug in? It also comes back to other structural arguments, such as what happens if we all plug them in at 6.00 at night. Is there going to be enough power in the country? There are a whole lot of things we do not have at the moment that need to be considered. They will become more popular, cheaper to run and give people better transport, so it will happen, but we need to get the infrastructure and the move to it in the transition period right.

Q136 **Chair:** These are all good challenges to have but they are of course ones that have be addressed if we are really going to get the most out of these electric vehicles.

Des Quinn: They are expensive challenges as well.

Chair: On that note, we will end that session. Thank you very much, Mr Wong and Mr Quinn, for coming to give evidence for us today.