



Transport Committee

Oral evidence: [Motoring of the future](#), HC 429 Monday 3 November 2014

Ordered by the House of Commons to be published on Monday 3 November 2014.

Written evidence from witnesses:

- [TRL Ltd](#)
- [Zero Carbon Futures](#)

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Members present: Mrs Louise Ellman (Chair); Jim Fitzpatrick; Jason McCartney; Karl McCartney; Chloe Smith.

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Questions 92-158

Witnesses: **Denis Naberezhnykh**, Head of Low Carbon Vehicles and ITS Technology, Transport Research Laboratory, **Professor Phil Blythe**, Professor of Intelligent Transport Systems, Newcastle University, and **Graham Grant**, Transport Development Specialist, Newcastle City Council, **Andy Eastlake**, Managing Director, Low Carbon Vehicle Partnership, and **Dr Colin Herron**, Managing Director, Zero Carbon Futures, gave evidence.

Examination of Witnesses

Denis Naberezhnykh, Head of Low Carbon Vehicles and ITS Technology, Transport Research Laboratory, **Professor Phil Blythe**, Professor of Intelligent Transport Systems, Newcastle University, and **Graham Grant**, Transport Development Specialist, Newcastle City Council.

Q92 **Chair:** Good afternoon. Welcome to the Transport Select Committee. Can we have your name and organisation, please?

Professor Blythe: My name is Phil Blythe. I am from Newcastle university.

Denis Naberezhnykh: My name is Denis Naberezhnykh. I am from the Transport Research Laboratory.

Graham Grant: I am Graham Grant from Newcastle city council.

Q93 Chair: Thank you very much. The Government's vision is to see tens of thousands of plug-in vehicles on the roads by 2015. Is that going to happen?

Professor Blythe: Not by 2015, I suspect, because that is only a year away. However, the SMMT reports that more plug-in and hybrid vehicles were sold in the last quarter than in the last four or five years. We are seeing a trend of adoption, but not the sharp curve that was predicted initially. That follows virtually every other country in the world.

Q94 Chair: What would we need to do to make that vision a reality or to get nearer to it?

Professor Blythe: You have to make the ownership of electric vehicles more attractive—I know there is a subsidy of up to £5,000—and have an appropriate charging network that is available to all. Countries such as Norway that have been really successful at adopting electric vehicles have put in place measures that make it attractive—free parking, use of bus lanes and not paying the toll on the toll rings around Norwegian cities, for example. Our experience of running very large trials of EVs in the north-east of England, for example, is that people need to be exposed to them. Once they see EVs, use them and realise that for most journeys usage of an electric vehicle is good enough, they begin to realise that it is a possible vehicle of choice for them.

Q95 Chair: Would any of the other panellists like to contribute? Is it going to happen? Why hasn't it happened? What do we need to do to improve uptake?

Denis Naberezhnykh: I very much agree that we are on a curve of gradually increasing and accelerating the take-up of electric vehicles. All the data over the last five years suggest that. The issue that we foresee from the research we have been involved in and have carried out is that there is still a lot of work to be done to understand what people actually want from these vehicles. What do they understand an electric vehicle to be, why would they want to buy one now, as opposed to five or 10 years down the line, and what do we need to put in place in terms of the ecosystem—the subsidies and other privileges they may be entitled to—that will facilitate the use of these vehicles, as we want it to be facilitated? I do not think that at the moment we have that quite in place, which is why take-up has not been what we would like it to be.

Q96 Chair: Mr Grant, do you have any suggestions?

Graham Grant: I endorse the other comments. It is important to note that last month, for the first time, sales of EVs in this country outstripped those in any other European country, so we are on the right trajectory. To reiterate what Phil said, a lot of it is to do with perception. A lot of the dealers in our area provide seven-day trials of electric vehicles, because just taking them out is not enough. Generally, they say that when they manage to get people to take up a seven-day trial, they invariably buy them. A lot of it is about

people's perception of what is available and what they need to be able to run these electric vehicles, and lack of knowledge about what is on offer already.

Q97 Chair: Are there any lessons from what has happened with plug-in vehicles in terms of infrastructure for other technologies?

Denis Naberezhnykh: I think we are still learning; there is still a lot to learn. What we have seen happen even over the last five years is that the infrastructure that was originally put in has very quickly become legacy. Very recently they were still changing the standards that vehicle manufacturers were choosing to go with. Although steps are being taken in the right direction to have multi-standard charging posts and charging points, there is still not a single, unified system so that a user can identify where is the nearest charging point—to the point where vehicle manufacturers have now taken it upon themselves to begin rolling out their own endorsed infrastructures, which is only accelerating their segregation into different trajectories and directions.

There is a big role to be played in bringing that all together and having an exercise where we can really get some learning from Plugged-in Places, which was a unique exercise that allowed different regions to experiment with different ways of deploying infrastructure. Some of those worked and some did not, but all of it was valuable learning. I do not think that all of that learning has been articulated and passed on to the industry in a way that is tremendously useful to them at the moment.

Q98 Chair: Professor Blythe, do you want to add anything?

Professor Blythe: I agree with what Denis said. Our strategy at some points has been quite piecemeal and not very cohesive. If there is not some way of trying to bring together the specifications and the sharing of knowledge on charging posts, we will see a divergence that will cost a lot of money and will put people off investing in EVs and EV infrastructure.

Under the TEN-T initiative, which is one of the EU programmes, they have funded a project, which is led by Nissan but also includes BMW, Renault and VW, to install 76 fast chargers along the trans-European road network of the UK and Ireland. Those will be multi-standard fast chargers, with four different plugs on them, which should be able to support virtually every EV in operation in the UK at the moment. It will be interesting to see whether having such a backbone of fast chargers will encourage uptake of EVs and more usage of the EVs that exist—in other words, that their duty cycles in the day will be increased because of the opportunity to fast-charge.

Q99 Jim Fitzpatrick: I notice that, in our brief, we are encouraged to make comparisons with the US and Norway. Professor Blythe, you made the comment that the trajectory for increase is similar to that which has been experienced in other countries so far. Can you place us in the world league table? How far behind the trajectory of the other countries you compared us with are we? Where are we in the world league table in terms of being interested

in developing the infrastructure as well as the purchase of vehicles? Could you try to place the UK on the world map for me?

Professor Blythe: The leading countries are the US, Japan and Norway. We are probably in the top 10. There have been a lot of positive moves to put in infrastructure, and some quite focused trials, but some of it is a bit piecemeal. There needs to be more joining-up so that it seems more cohesive and the general public understand that EVs are here, EVs are of use to us and that maybe they should consider buying one—not necessarily as their first car, but perhaps as their second car.

We share trial data with Germany, China, the US and so on. What we are finding is that they are all going through the same sort of teething problems. The only way to ramp up to the next level seems to be large, co-ordinated demonstrations, trials and incentives to get people to move towards EVs.

Q100 Jim Fitzpatrick: So the time frame between us and other countries is not massive?

Professor Blythe: No, it is not. I do not think we should do ourselves down too much; we are in the top 10.

Q101 Chair: The Government's strategy is for a mixture of fuels in the future. Is that going to happen? If not, what else should be done? Professor Blythe, do you have any views on that?

Professor Blythe: It is a good strategy not to put all your eggs into one basket. A lot of funding will go into the hydrogen economy quite soon, through the Technology Strategy Board and through European funding. The vehicles exist, largely, and have existed for a lot of years. The challenge is to get an infrastructure in place to support them, in exactly the same way as the electric vehicle recharging infrastructure had to start from a very low base and move forward.

There is a challenge, but a lot can be learned from what we have done with electric vehicles—in particular, understanding what are the optimum locations to put charging posts. In the initial Plugged-in Places, there was a rush for lots of people to host charging posts. You did not want to discourage that, so a number of them were not in the optimum places, and obviously the press and the media picked up on that. Now that we understand which businesses and individuals own these cars, you can begin to target the places that are the optimum locations for infrastructure. That will make a great difference.

Q102 Chair: As we are going now—if there are no big changes—will there be a mixture of fuels?

Denis Naberezhnykh: Going forward—particularly if we are talking about 2050 levels, which is what we are trying to achieve in terms of the decarbonisation of transport—we absolutely should consider a mixture of fuels. In reality, in order to hit the targets for the decarbonisation of transport, we are looking at electrification—in one way or another.

That does not necessarily mean purely electric vehicles. They could be fuel cell vehicles, gas hybrid vehicles or petrol and diesel hybrid vehicles, but they will have an electric drivetrain of some sort. That means that all the developments for energy storage technologies, charging technologies and the deployment of infrastructure will be applicable across a multitude of possible fuels. Although we are going to see many different fuel types, almost all vehicles in the future, as far as we can see, will have some form of electric drivetrain, which means that they will all be able to benefit from charging technologies and from developing battery and energy storage technologies. I do not think that currently there is realisation of that, because we often hear debates, particularly in the media, that try to prioritise one over another: “Should we be investing in gas or should we be investing in electric vehicles?” Actually, it is not a mutually exclusive situation. Electrification is the only way we currently know of that can meet the targets that we want for decarbonisation and air quality.

Q103 Chair: Are there any lessons to be learned from what happened concerning liquefied petroleum gas—LPG? The subsidy there went, didn’t it, and then it had a dramatic effect?

Denis Naberezhnykh: There is a lot of research into why LPG did not become more successful. The messages are mixed, but some of the evidence seems to suggest that the mixture of developing the infrastructure together with the subsidies and the payback period never quite hit the right combination. The lessons to be learned from that are that we could find ourselves in the same situation with electric vehicles and the infrastructure we are talking about at the moment.

It is extremely important not to consider them in isolation. It is not just about how many charging points we can put out there—there isn’t a number that we can place so that we can compare ourselves with the rest of Europe to see how well we are doing; it is really about understanding where those charging points are. Are they of the correct type? Do they give the users what they need? Do they match the vehicle types that users want to use? The lessons from LPG show us that, in the UK at least, we did not do that to the same extent.

Q104 Chair: Is the Office for Low Emission Vehicles—OLEV—doing enough? It was set up to promote this kind of technology and different fuels. Is it doing enough in that area?

Professor Blythe: OLEV has quite a challenging role—to promote and push forward a range of low-carbon vehicles and the associated technologies. They have suffered from a lot of change in personnel at the top since they were set up, so sometimes they have not been able to push forward their ambition and strategy as quickly and cohesively as they would like, although they are doing some very good work. They have an award of an extra £500 million to subsidise vehicles, to put in public transport systems and to try to spread the use of low-carbon technology away from the obvious business focus and the private car focus. I think it will work—it is just taking a bit longer than would have been hoped. That is largely because they have had significant changes in personnel, so you do not seem to have the conversations with the same people all the time to take things forward.

Q105 Chair: Is that the basic problem? Is it not to do with its remit, its funding or the authority that it has or does not have? Do you think it is solely to do with the change in personnel?

Professor Blythe: That is one of the reasons. They have quite a difficult remit because they are covering so much and they have to report to a number of different masters, which is sometimes a little challenging.

Q106 Chair: Are there any particular ones causing the problem?

Professor Blythe: None comes to mind.

Denis Naberezhnykh: I very much agree with Phil's comments. It is not clear, to us at least, what OLEV's role is—whether they are supposed to be setting the strategy, allocating funding or choosing where the funding should go. At the moment, we have a multitude of bodies that have been set up. OLEV is one of them, but we also have Innovate UK, the various smaller bodies that have been set up and the Transport Systems Catapult. It is very unclear where the boundaries between those disparate entities lie. In OLEV's role what has not happened to the extent that it should have happened is an overarching strategy that very clearly defines the direction we are going in, and not only takes us to the R and D stage but provides a road map to take us through R and D into demonstration and implementation. That is something we have not seen. We have pockets happening all over the place, but not a consistent road map that covers all of those.

Q107 Chair: Mr Grant, have you had any dealings with OLEV?

Graham Grant: I have, and I think they fulfil a very useful function. It is very useful that they have a base across different Departments, given what Transport is trying to deliver in this area. It is an enabler. Having previously written strategies, I understand how hard it is to get all the necessary political sign-offs to strategies and how difficult it is very clearly to prioritise within a strategy what you want to deliver. Once you have sign-off for a strategy, it takes different people a lot more time to deliver that strategy than it took to write and seek agreement for it. Having OLEV create a strategy is one thing and it is very useful, but delivering it is an entirely different job.

Q108 Chair: What are you saying—that they are not delivering it?

Graham Grant: No, I am not saying that. I am just saying that any type of lag time that there may be is to be expected. It comes back to the lessons learned question that you asked before. Anything in this field will take time to implement. It will take capital investment up front. It will then take time for that capital investment to drive take-up of it. For example, the availability of the infrastructure that we see—which is now, to some degree, legacy in terms of its technical status—is what is driving people to think that they can get an electric vehicle, but it will take time to move forward.

Q109 Jason McCartney: I am a big supporter of nudging consumers in the right direction. I now have a low-emission car to take advantage of the lower car tax rates. We have talked about OLEV, but what about local councils? My council is Kirklees council in West Yorkshire. I have been to see the city car club that they support, but I cannot think of any power points for electric vehicles. Mr Grant, can you tell me what you are doing in Newcastle? Is there any evidence that the investment you have put into local infrastructure is driving demand for ULEVs?

Graham Grant: There certainly is. We have publicly installed just under 80 chargepoints in Newcastle.

Q110 Jason McCartney: In the city centre or in—

Graham Grant: In and around the city centre, but also in—

Q111 Jason McCartney: I lived in Jesmond for two years, so I know Newcastle.

Graham Grant: There are around three in Jesmond. We have them across the city and in the city centre. We also support a car club, which has electric vehicles; at the moment we are taking advantage of funding opportunities from Government, in terms of Carplus, to try to add more to it. Local authorities have to take an enabling function. There are also opportunities. While we have 79 chargepoints in our local authority area, our council has delivered around 850 across the country. We have set ourselves up on the delivery side of the organisation to become specialists in this area and have delivered chargepoint facilities in Scotland, the south-east and all over the place.

Q112 Jason McCartney: Which council would you hold up as an excellent example of this working in reality?

Graham Grant: I think the reason why someone from Newcastle city council was invited is that, basically, it is us in the north-east. In terms of the way it is being driven forward and the impact that it has had on people's take-up, it is really important that we have Nissan building electric vehicles in the north-east. Our lord mayor recently traded in his normal car and is now driving an electric vehicle, which is now our official vehicle. We have various public chargepoints and we are installing them for private organisations. We are undertaking behaviour-change initiatives as part of local sustainable transport plans.

Q113 Jason McCartney: Do you have any figures or statistics to back this up, or is it all anecdotal?

Graham Grant: Nissan said that in September 2014, they sold 450% the number of Leafs in the north-east that they sold in September 2013. I said, "Is that up from two to nine?"

and they said, “No, it is over 1,000,” so it is quite significant. The infrastructure is in place, and people are getting more used to these vehicles. A lot of them are sold on two to three-year leases, so a number of second-hand vehicles will be coming back on to the market now. There is an opportunity for the Government in how they look to that. If second-hand electric vehicles really take off, it will be very important, because a lot of people perceive that they cannot afford a new vehicle—they may be able to, but it is the perception issue, which comes into nudging—but they may be able to afford a second-hand vehicle.

Q114 Jason McCartney: Is there a particular location where the chargepoints have been most well used and most successful?

Graham Grant: There is. Generally they are in the city centre and in multi-storey car parks. We as a council have to look at the reasons for that. Is it that people are parking there for free and, therefore, avoiding any charge during the day? There are other areas where they are not well used at all. There is mosaic profiling and ideas of where people are who are likely to take these things up; they seem to work, but generally they are most well used in the city centre.

Q115 Jason McCartney: Gentlemen, do you have anything to add on Newcastle’s experience?

Professor Blythe: I would take it into the north-east as a whole. Charge Your Car, which is the charging system for the whole of the north-east, now has over 1,000 public charging posts, and a large number of fast charges. Although the north-east is one of the less well-off areas of the UK, it has the highest number of EVs per head of population in the UK. That shows that if you have the infrastructure, and if people are exposed to EVs and there are some EV-friendly policies that make them attractive, a proportion of people will take them up. Soon we will go beyond the early adopters to that middle bunch of people, which will really increase the numbers. I am now quite optimistic about it.

Q116 Jim Fitzpatrick: I have a small supplementary for Mr Grant. How are you exporting expertise to other local authority areas and to Scotland? Are you just sharing it? Are you advertising it? Are you selling it? Are you making revenue from it?

Graham Grant: We are selling it.

Q117 Jim Fitzpatrick: Are other local authorities only too keen to buy it?

Graham Grant: Yes, thus far. We have a trading arm that delivers things on our behalf. They set themselves up as a specialist provider, based on what happened through Plugged-in Places. Newcastle city council won the contract to deliver all 1,000 of those. That has enabled us to position ourselves, knowing what we are doing and, therefore, going out to deliver it elsewhere.

Jim Fitzpatrick: Very good.

Q118 Chair: What can be done to encourage local authorities more generally, or the public sector or major companies, to take up fleets of cars? The movement seems to be pretty slow. What else could be done?

Professor Blythe: It has been slow up to now. We have been involved in quite a few trials where we put data loggers on to fleets of vehicles to inform the fleet operators how those vehicles are being used, and whether replacing them with electric vehicles would make sense. We have done it for local authorities, a number of businesses and the North East Ambulance trust, for example. In many cases, a significant proportion of the vehicles, based on their daily duty cycle, could be replaced by EVs. Indeed, once the fleets do the economics of having an EV and its running costs over four or five years, they find that they more than break even, in terms of cost and so on. People are beginning to see the economic case for EVs. It also hits the green agenda of low emissions, health in urban areas and the like.

Q119 Chair: Who should be promoting this? Should the Government be doing more, or is it for somebody else?

Denis Naberezhnykh: We have looked at this from the London perspective. We did some research with the Central London Freight Quality Partnership to look at how we could encourage the freight industry—light and heavy vehicles—within London to use low-carbon and electric vehicles more. We found that the existing charging infrastructure in London was completely unsuitable for those fleets. It was unsuitable not just in terms of the technical capability, in that the charging infrastructure was not fast enough to facilitate the use of electric vans, but also in terms of the location of points, which did not correspond very well with the behaviour of the vehicles and the movement of those vehicles throughout the day, because of course, the intention is to minimise the amount of time that the vehicles are idle throughout the day. That did not quite work out.

The recommendations that we arrived at with the Central London Freight Quality Partnership were to have a system of encouraging local businesses, where it made sense financially, to adopt infrastructure in their own depots and then determine, once there was minimal penetration of electric vehicles in a city, the key locations scattered around the city where supplementary recharging infrastructure would encourage further take-up. That seemed to work as a strategy. We have not yet seen it fully implemented, but I know that Nissan is looking forward to introducing their electric e-NV200 later this year or early next year. They have concerns about how they can encourage businesses to use such vehicles, because they too see that the infrastructure that is currently out there does not do that job. There is a role for local authorities, particularly those that have had that experience. There is also a genuine need to have a better understanding of the behaviour and needs of businesses, to encourage the adoption of the vehicles and the charging infrastructure to support them.

Q120 Chair: Mr Grant, what would you say about that?

Graham Grant: We have a variety of vehicles in our fleet. For example, we already have quite a few electric cars. One thing that we think would be really useful would be waste trucks, but they are 7.5 tonne trucks that have not yet been delivered as EVs. If you take all the local authorities in the country, it is a huge market. That is the kind of thing we would love to see electric vehicles delivered for.

Q121 Chair: Why do you think they are not doing it?

Graham Grant: To some degree, I guess, it is because the market is finite. It is not as big as for electric cars. It is the market that will lead the development of these things. Somebody from the automotive industry would be better placed to answer that question.

Q122 Chloe Smith: I wonder whether you can help us with some links between the different parts of what we have been looking at in this inquiry. For example, in our last session we were looking in much more detail at intelligent vehicles and the set of technology around them. Do you think that the fuel that a vehicle uses is connected to the systems it runs on? Ought we to be considering what we are discussing today in connection with the intelligent vehicle strand of our inquiry?

Professor Blythe: Intelligent vehicles can run on any fuel, but, as we move into the future, more of those vehicles will be electric or plug-in, or will use some other fuel source related to that, as Denis explained. I see a real role for moving towards autonomous vehicles, for all sorts of reasons. In urban areas, you can manage and optimise traffic if you have some control over speed, lane or whatever at certain times. As people get older, they have functional and cognitive declines. Assistive technologies in cars to help them when they cannot judge distances or speeds are important.

I see a lot of reasons why automation in vehicles will come. Virtually all you need for fully autonomous vehicles is there now in different vehicles; it just has not all been brought together. It has real safety benefits and will allow platoons of freight, which may increase capacity on the roads. Connecting that to electric is logical, because they will be the next generation of vehicles; we should bring it all together. Then you can have intelligence on things like inductive charging, which Denis knows way more about than I do. There is a real opportunity for UK industry and other stakeholders to be at the forefront of that.

We are delighted that the Government have a competition on driverless vehicles. My only comment on that would be that it would be better to have a study of the road map towards automation over x number of years—period—rather than go for driverless, but I can see why they are doing that. It is a nice, sexy term that gets the public engaged.

Denis Naberezhnykh: I largely agree with what Phil said. There are two issues. One is sustainability, in the sense of reducing air quality impact and CO₂ and greenhouse gas emissions. The other is the transport system as a whole, in terms of issues such as congestion and traffic management. Intelligent vehicles are of course going to contribute

to the latter, regardless of what fuel they use, so that is an issue that needs to happen. What we are seeing with electric vehicles, and vehicles that are electrified, is that they tend to be more intelligent anyway, because they need to rely on the infrastructure considerably more than traditional vehicles. They need to have their communication enabled and to have the ability to recognise what is around them.

At a more basic engineering level, having an electric drivetrain of some sort makes it far easier to automate some functionality of the vehicle, whether it is steering, acceleration or deceleration. Those basic building blocks of autonomous vehicles are now easier to implement in electric vehicles. All those things come together and we should consider them together, especially if we are talking about platooning and vehicles that can function within constraints or bounds, whether they are buses, taxis or vehicles on a highway. The most difficult thing to do is to put a vehicle in the middle of the city and say, "Now it is autonomous." Of course, there are building blocks around that. We need to explore those separately and not necessarily do the most difficult thing straight away.

Q123 Chloe Smith: Before we go on, may I press you on your second point, just for understanding? I think you just said that intelligent vehicles contribute to congestion. Do you mean in the sense of adding more congestion or of contributing to our understanding of the problem of congestion?

Denis Naberezhnykh: In the sense of contributing to resolving that problem, potentially?

Chloe Smith: Yes.

Denis Naberezhnykh: Once vehicles begin to have some form of intelligent communication between them, they are able to plan their journeys much better, particularly when there is a growing penetration of those vehicles within a given area. We are likely to see reductions in emissions and air quality impact, as well as traffic levels, purely based on the fact that the vehicles are able to communicate. Of course, the addition of some low-carbon vehicle technology further improves that.

Graham Grant: For me, as someone who works for a local authority, the issue is that the infrastructure, as well as the vehicle, needs to be intelligent. The vehicle can provide really useful information, but ideally our aim is to upgrade our infrastructure so that, every time we replace a traffic light, we put in the newest technology and can take advantage of some of the trials that we are doing. That is why our council is investing money in designing schemes that will fulfil that.

Ideally, your car park should be telling not only the junctions in its vicinity but the vehicle further out that it is full, and changing change traffic lights on the way in, so that you can manage traffic flow better. Not only does that improve air quality in terms of the flow of vehicles; it enables you to reallocate and change the way road space is used in town and city centres, so that you can manage everything a lot better and replace with public spaces what used to be, potentially, lanes of traffic queuing for a car park, because the queuing is being done further out, on the junctions into the city.

Q124 Chloe Smith: What you are saying about infrastructure and one of the previous comments about intelligence already being there in some electric vehicles is very interesting

in the context of what we have looked at previously on intelligent vehicles. One of the big questions we would like to know more about is the ownership of data that arises in this. You may have early insights, if you are doing it already.

Graham Grant: The integrated transport authority in Tyne and Wear has now been subsumed by the combined authority, but we signed up to the principle of open data in July, after the Government launched all their strategies in June 2012. Open data is an interesting one, because it is only as good as what people are doing with it. We have been engaging with local software developers in incentivising competitions to see what kind of applications they can come up with. A lot of the time, people are focused on mobile phones and so on, but some of the markets we are looking at, such as older people, are not necessarily using mobile phones, so the applications have to be different.

The other thing with open data—and, I guess, with some of the technology we are talking about more generally—is that when you talk to local politicians about the idea and principle of open data, in the same way as when you talk to them about the principles of intelligent transport systems, vehicles and so on, they are people who have grown up with things like the Data Protection Act 1998 and the idea that you protect data, not that you turn around within 20 years and free it all up and make it available to people. Some of the things we are talking about, both with open data and with intelligent transport systems, are quite new to a lot of the people we deal with at local authority level.

Q125 Chloe Smith: Specifically in a local authority context, there are also some clashes. As you say, people are more used to protecting—deeply protecting—casework data, so an organisation could have to do two things at once.

Graham Grant: Yes.

Q126 Karl McCartney: At the risk of sounding a bit like a cynical Jeremy Clarkson, what car do the three of you drive?

Graham Grant: I knew you would ask that question—or I thought you would.

Q127 Jason McCartney: I hope you have a Leaf.

Graham Grant: No, I do not. I live in the city centre. I own a car but I use it for longer journeys—I will get to answering your question. I walk to work most of the time, or I cycle or get public transport. I live in the city centre, so I have that option available to me. I drive a diesel car but I use it for longer journeys. I have been talking with my wife about the idea of getting an electric vehicle, but it is about the fact that we use our car only for longer journeys. We also have a little one, so we have just bought a bigger car.

Q128 Karl McCartney: What type of diesel is it? I am going to nail you down to the make and model.

Graham Grant: It is a 10-year-old Mercedes C220.

Denis Naberezhnykh: I drive my company car, which is a 1 series BMW diesel. It is one of the lowest emission vehicles in its class, at 109 grams of CO₂. I wanted to go for a plug-in hybrid, but it is a company car and the Ampera that I wanted was almost twice the price. That brings me back to the issue that we discussed earlier of getting people to take what we want them to take. I was one of the keen adopters; TRL were thinking of installing charging points in our company. At the moment, even for people who want to do it, getting a plug-in hybrid is largely unaffordable.

Q129 **Karl McCartney:** Professor, do you want to dispel the myth about academics? Here is your chance.

Professor Blythe: My family car is a Honda Insight, which is a hybrid and a very nice car. The car I use most is a Peugeot iOn, which is electric and is one of my work's cars, but I am quite a good boy and tend to take the Metro to work anyway.

Jason McCartney: I thought you were going to say that you had three cars.

Karl McCartney: I thought you were going to say that you had a Rolls-Royce.

Chair: You've all got complete answers.

Karl McCartney: Thank you all very much. That's very kind.

Q130 **Chair:** Are the Government doing enough to support research and development in this whole area—in relation to fuels and technologies and in encouraging business to take up opportunities? Professor Blythe, you are contemplating.

Professor Blythe: There is a lot of activity out there, but I do not feel it is joined up. I used the word “piecemeal” before and I would use it again for research support and funding. It could be brought together. There are activities going on with Catapult and Innovate UK, and competitions coming out directly from Departments. I do not feel that it is co-ordinated as well as it could be really to push forward research in the UK.

Q131 **Chair:** Earlier you spoke about the Office for Low Emission Vehicles and about there perhaps being too many people in charge or involved in it. Do you think that the Department for Transport is clearly in the lead there? Are other people with other interests there, too?

Professor Blythe: My view is that the Department for Transport should take a stronger leadership role in all of this. Quite often they pass it on to others. For example, the driverless car is a DFT competition but it is being run by Innovate UK, so there is—shall I say—a compromise between what the DFT wanted and what Innovate UK wanted. I do not think that the actual output will be exactly what was desired. This is happening all the time. There needs to be a much stronger overarching strategy in all of this, because we

have all the component bits. The UK is in a fantastic position, but it is not brought together well enough at this point.

Q132 Chair: Do the other panellists want to comment on whether there is a clear strategy, with someone in the lead, and whether it is all brought together?

Denis Naberezhnykh: I wholeheartedly agree with what Phil said. I would go as far as to say, “No, there isn’t.” When we think about the R and D that is being done in the UK, the industry does not tend to think that OLEV is doing that. In some parts it is Innovate UK and in others it is wherever else the funding is coming from, but it is completely disjointed.

As I mentioned earlier, not only does there seem to be no direct correlation between the R and D that is happening at the early technology readiness levels and the eventual demonstration and implementation—there is no follow-through that happens through the entire chain—but there seems to be a mismatch in terms of what we are doing to develop as yet more technology options. We have enough options; now we need to understand how to implement the ones that we know work. I understand that we need to continue to innovate—that should be happening—but, separately from that, we should be doing far more research into what is the best way of deploying the technologies that we know, or that we think work. Again, that does not seem to be very well articulated at the moment. It certainly does not appear to be co-ordinated, coherent action.

Q133 Chair: Mr Grant, do you want to comment on whether there is enough support for research and development and whether there is a clear enough strategy? How do you see it from where you are?

Graham Grant: There is a lot of support from various organisations and parts of Government. In terms of research and development, my colleagues are probably better placed than I to comment. We focus on deploying things.

There are some things with the bids. Phil made the point that you have various different Departments involved in the same funding bid, which means that they want different things out of it, and that does not always suit the local authority—the people who have to deploy things on the ground. If the majority of funding is going towards research, for example, and there is only a small part for us when it comes to trying to deploy it, and things like maintenance have not been taken into account, that does not support us hugely.

Chair: Thank you very much.

Examination of Witnesses

Witnesses: **Andy Eastlake**, Managing Director, Low Carbon Vehicle Partnership, and **Dr Colin Herron**, Managing Director, Zero Carbon Futures, gave evidence.

Q134 **Chair:** Good afternoon. Welcome to the Transport Select Committee. Could we have your name and organisation, please?

Andy Eastlake: I am Andy Eastlake from the Low Carbon Vehicle Partnership.

Dr Herron: I am Colin Herron from Zero Carbon Futures.

Q135 **Chair:** I know that you were listening to the previous session, and you heard us discuss the lower than expected take-up of plug-in vehicles. Do you have any views on that? Is there anything different you would want to say?

Andy Eastlake: From our perspective, we are at the start. It is probably a longer game than perhaps was anticipated at the outset. There are some very positive figures coming through now, which we have heard about, but it will take quite a while for a transition in mobility, fuels and the whole agenda. It is a long game that we are playing; that is one of the important points. We are seeing a huge amount of response from industry, to try to help to push it forward and deliver it, but there is certainly more that we can do.

Dr Herron: I think it is slightly different. The targets that were set three years ago were, frankly, completely unachievable. I say that because a lot of the models people based volumes on have just come to market. The Volkswagen Golf and the BMW i3 have just appeared. The whole capacity was being sustained by either imported Nissan Leafs or the start of Leaf production. I have looked at targets for seven of the 28 European countries that say there will be over 4 million vehicles on the road by 2020. Frankly, there simply is not the manufacturing capacity to do that. The numbers that are out there have been more a hope than a reality that could be achieved. If you interrogate the capacity of the manufacturers and have a look at OLEV's projections now, we are probably where we should be.

Q136 **Chair:** What is your assessment of the work of OLEV? Is it driving this forward in the way it should?

Dr Herron: As other speakers have said, OLEV has done an outstanding amount of work to introduce something that has not been done before. We have never tried to introduce a technology when there was nothing wrong with the prevailing technology. We are trying to sell something to people when they do not actually have a problem, which is quite difficult. There has been a turnover in staff, but that is quite an enormous challenge to take on.

Q137 **Chair:** Is this leap forward ever going to happen? You said that the capacity to manufacture simply is not there and that they are trying to do something to address a problem that people do not think exists.

Dr Herron: The capacity is coming in. It is now hitting the market, but it is hitting the market in 2014 and 2015, not in 2010 or 2012, when people thought it would. As take-up moves, manufacturers will back up the market demand with capacity. They always do that— what sells well, they will back up. As one of the previous speakers said, we have to move to this technology—it is a move. It is not really an option; we are moving that way.

Q138 Chair: Is there enough Government or other support to enable this to be done? Should the industry be helped more?

Dr Herron: I spent a long time in the automotive industry. The automotive industry does what is very good for the automotive industry. Trying to change the industry's mind is quite difficult. What we have to do is see where the automotive industry is going, which is always difficult to predict, and have strategies to support that. If we tried to change where they are going, there would have to be some form of massive financial package to get them to change their mind, because they are heading down a route.

Q139 Chair: What would be the impact of a large number of electric vehicles on power networks locally and nationally?

Dr Herron: There are lots of experiments going on. Currently there is a really excellent one called My Electric Avenue, with 10 streets in the UK that all have Leafs in the street, and they are measuring the impact on the grid. Recently I think I saw that National Grid said that they could handle about a million before they have a problem. I know there are power stations that currently have problems. If all 23 million vehicles in the country were to convert to battery or plug-in EV, it might be a problem, but if we move to electric powertrain, which could be powered by diesel or some other form, it will not necessarily be a drain on the grid.

Q140 Chair: Mr Eastlake, do you have anything to add on that?

Andy Eastlake: We have focused rather myopically on electric vehicles. One of the earlier speakers made the point that autonomy is on a spectrum, and powertrains and fuels will be on a spectrum. There are certainly electric drivetrains. An electric motor within the drivetrain—and the ability to regenerate and recuperate energy from braking—is absolutely part of the solution, but there are a lot of options for the energy stored on board and how you generate that energy in the vehicle. Hydrogen is one of them, as is electricity, but so are the existing, incumbent fuels—diesel, gasoline, gaseous fuels and, of course, biofuels. We will have a plethora of solutions that we need to take us forward through the 2030 and 2040 time frame.

Q141 Chair: What would you say is the scope for more investment in alternative fuels? What should be done to increase the range?

Andy Eastlake: We have a fair range of alternative fuels available. In fact, quite a number of vehicles are already running on LPG, CNG, LNG and, of course, biofuels, as drop-in for our conventional diesel and petrol. We probably have the range that we need to take us forward. There is certainly investment in developing those fuels. One thing that we have seen over the last few years is a very close relationship between the automotive industry and BIS, and an industrial strategy around supporting that industry. I do not think that the energy side of the equation, which will power these vehicles, has seen the same sort of support, investment and strategic approach.

There is an opportunity to move that half of the equation forward and to try to take the same sort of initiative that we had in terms of UK research and development in automotive technologies. Undoubtedly the UK has a skill there and credibility worldwide, but what about the energy? Energy storage is part of our industrial strategy in terms of research, but there is a lot of activity on energy, fuel generation and fuel specifications that it is important to bring in cohesively, in the picture for overall transport strategy.

Q142 Chair: What does that need? Does it need someone or a Department to identify it as strategically important? Does it need funding—investment support for specific areas? What do we need to do to make a breakthrough come?

Andy Eastlake: From my perspective, we have seen a very collaborative approach that has worked in a number of areas. We as the Low Carbon Vehicle Partnership have a membership steering process and we get lots of different perspectives on a challenge. The Automotive Council, particularly for the automotive industry, has been very effective in collaborating to try to steer the direction, to give some strategic vision and support the industrial strategy development process. It is about that sort of energy and collaboration. I genuinely think that OLEV is one of the places where we are starting to see some of that activity.

Q143 Chair: Is OLEV doing it?

Andy Eastlake: It is starting to. OLEV is a great initiative to try to break down boundaries across Government Departments and bring people together to work on the same challenge. As in some of the evidence today, we have seen a bit of a focus on electric vehicles. Going forward, through our interaction with OLEV, we are now seeing them look far more widely. The next package of funding is based far more widely than in previous activity, so we are starting to see more of that. We need to include a wider range of Government Departments. DECC are in there. DEFRA and the Treasury are not notionally part of OLEV, but they all have a key role to play in delivering this. A collaborative approach in both industry and Government is critical to moving it forward.

Dr Herron: OLEV and Government tend to work on themes—hydrogen, plug-in or EV. The UK is a very diverse area. Not every technology is suitable for each area of the UK. When we have lotteries, anybody can bid for them. The Scottish islands are absolutely ideal for EV and hydrogen, because they can make it from wind power. Teesside is a hydrogen economy, because it makes 50% of the country's hydrogen. Rural economies

can use methane, because they can recycle waste. For me, city centres like London are not natural hydrogen places, because it is hard to get it in and hard to control.

As we move forward, we have to think that while there is different transport for different areas—hydrogen is for heavy goods, buses and trucks, and EV is for small urban—we also have to think of where in the UK those technologies will be applied. There is absolutely no sense in shifting hydrogen from Teesside to Cornwall in trucks under compression. Digging a pipeline from Teesside to Cornwall also does not largely make sense. We have to look at which is the correct economy and the right fuel for that economy, and then maximise it as much as possible.

Q144 Chair: You do not think that is being done enough now.

Dr Herron: I do not think it is being looked at in that sense. We tend to look at generic topics, such as hydrogen, or diesel, or hybrid, or induction or autonomous. Instead of looking at a mosaic of a city, we should be looking at a mosaic of the country and where are the best fuels for the best application.

Q145 Jason McCartney: Last week I hosted a session on fuel duty, which was attended by members of the Road Haulage Association. What is that industry doing to take forward new energy sources? They showed me figures for the amount of fuel duty that they pay every year, so surely it would be in their interests to find more efficiency. What is the road haulage industry doing to invest and innovate?

Dr Herron: The technology has not really got to trucks. It has got to buses, but if someone wanted to go out and buy a full hydrogen vehicle, they would struggle to acquire and run one. The trials at the moment tend to be with buses; in London and Aberdeen, we are looking at buses as well.

Q146 Jason McCartney: Is there no investment at all in the road haulage sector?

Andy Eastlake: It is important to reflect where different types of vehicle are in this process. As Colin mentioned, the UK is one of the leading lights in low-carbon and hybrid buses. We have had a very effective process of accrediting a certain threshold, which has led to manufacturers making very effective inroads into that market. We are now the largest market for low-carbon buses.

The truck market is still some way short of that. Some of the work that we are doing at the moment is around giving evidence of relatively straightforward technology such as aerodynamics and low rolling resistance tyres—some of the technologies that are not universally adopted but can make significant inroads. It is not the 50% saving in CO₂ that you might want to see from a highly hybridised bus, but 5%, 10% or even 15% fuel economy savings are very valuable to the truck market. The technology for hybrid trucks is starting to emerge at the lighter end of the market.

Q147 Jason McCartney: Where?

Andy Eastlake: In the 7.5 tonne—

Q148 Jason McCartney: In which countries?

Andy Eastlake: There have been some demonstrators over here in the UK, which we brought over. I think that DAF and Mercedes have hybrid trucks available; there are certainly a number of hybrids at demonstration level.

Q149 Jason McCartney: But no companies are investing in them at the moment?

Andy Eastlake: They are investing in hybrid solutions on trucks; there certainly are some. Part of the challenge is that the ideal application for those is in the urban environment, where you are not doing the same sort of mileage or using the same amount of fuel, so the economics of saving fuel versus the cost of the technology get quite challenging. The bulk of the fuel in trucking—75%—is consumed in the long-haul and regional area, so things like aerodynamics have pretty significant application, but that is not to say that these technologies will not emerge, and will not emerge in an economic way. I am sure they will need support to trigger that. We have already seen evidence of that thinking in some of the OLEV planning for the next round of funding. They have identified the HGV market as one they want to try to stimulate, specifically the bus market and, of course, taxis.

Some of the technologies from the mass electric car market—or plug-in car market—will ripple out into other areas in an appropriate way. I pick up Colin's point that different solutions will be more or less appropriate for different applications. Where I have a little bit of contention is that the automotive industry is a global industry; people are not making a car for Teesside. They are not even making a car purely for the UK—it is a car for Europe at least, if not a world car. Fuel specifications are very highly controlled, so we need to make sure that the products that we are trying to push forward are compatible across the fuel infrastructure and across vehicles. We need to be careful about trying to niche down too small in terms of locality.

Q150 Jason McCartney: A lot of ministerial cars now are hybrids—Priuses. Is there any example of Government giving support to public sector fleets across the country? What support is available for them to switch to ULEVs? What support do you think there should be, if it isn't there now?

Andy Eastlake: Obviously Government procurement is eligible for some of the grants. I am trying to remember the details of it, but there is an OLEV public procurement fund of £5 million, I think, at the moment, targeted specifically at encouraging take-up in public fleets. That was one of the key items that emerged from the call for evidence that OLEV ran at the end of last year. They genuinely listened to that evidence, because we see some of that in the items that are coming out now. That listening and collaborative approach is

proving more and more successful, because we see how incentives can be disincentives if they are not considered from every angle. One of the challenges we face—you picked up on it earlier—is around a consistent approach to support mechanisms. For example, I drive an ultra-low-emission car.

Q151 Jason McCartney: My colleague is not here to ask you what cars you drive.

Andy Eastlake: I will put that on record now. But of the two train companies that I could use to commute into London, one gives me free parking and the other one gives a 10% discount for a vehicle below band C. There is inconsistency. In one place you can charge up free of charge, but in another you pay for the electricity, and you have to have two different RFID cards. We have a single system for gasoline and diesel that works the whole country over. We do not have that yet for charging electric vehicles. We are now getting to the stage where the take-up is such and people want to use them in such a way that a national solution is needed.

Q152 Chair: Do you think that consistency would make a difference?

Andy Eastlake: It is one of the things that would make a difference. We heard earlier that communication and getting people to experience the new vehicles—electric, plug-in, gas or whatever it might be—suddenly make it real to them. Bums on seats in electric cars are one of the key things to help the market to move forward.

Q153 Chloe Smith: Mr Eastlake, the last point you made is very interesting. Earlier it was said that the automotive industry does very well for the automotive industry—a perfectly fair statement. Presumably that means that it likes to sell lots of cars to people who then put their bums on the seats. Why is this entire discussion so much focused on Government, instead of on companies selling good products to customers?

Chair: Dr Herron, you are in the hot seat on that one.

Dr Herron: It confuses me sometimes. There is absolutely nothing wrong with the product. The product is as it is in the showroom, but how do we enable that product to leave the showroom and how do we convince the public that they want it? The car companies have had varying success and different campaigns to sell it. Some companies have simply put vehicles in the showroom and tried to sell them in exactly the same way as a normal vehicle. In my experience, that has not been at all successful. Others are trying to show people that it is a life change, something very different. That is quite important—they have to go that way.

There is a lot of emphasis on Government. The role of the Government is always to start a technology and get it rolling. In my opinion, they have done that very successfully with regard to EVs. We are now getting to the point—the interesting point—of asking, is there actually a business? The vehicles are a business that the car companies will take over. The difficult one is the business for the infrastructure. The money was supplied to put it in. It is

now going through the valley of death; it is in and it is waiting for the customers. All the incentives that we put out there—free parking and free electricity—have now become an expectation. Consequently, the people who are trying to install and maintain this equipment have no revenue. It is quite a hard phase. They now have to wean people back on to payment, but the payment has to be enough to recuperate costs. A lot of the pioneers now putting in the equipment are putting it in being hopeful.

Andy Eastlake: The Government have a key role to play. At a high level, in terms of trying to change cultural perceptions of what motoring is, there is a role for Government in setting the agenda and saying, “Actually, this is possible.” OLEV, in conjunction with a number of manufacturers, have been doing that with their Go Ultra Low campaign. Very quickly it gets into competition between manufacturers, so it is very delicate. I am aware of some of the challenges that the campaign faced, but there is a role in helping society to understand that there is another way of moving around, using these vehicles.

Picking up on one of the previous points, I think there are things we can learn from the past. You highlighted LPG vehicles back in the early 2000s. One of the things we can learn from that is that we need to think about both how we enter into Government grants and how we gradually tail out of them. The main thing that affected that market 10 years ago was the overnight cessation of the Government grant. Electric vehicles have a Government grant, which helps the economics but also sends the message that the Government support this. That is a very important message. Stopping a grant dead in the water sends another, very negative, message.

Some of the success that we have seen in the truck market, for example, looking at gas, has come from long-term vision and planning on some of the support and incentives. We now have a 10-year vision for road fuel duty for gases, which gives that market some confidence—I can make an investment in my vehicle if it will pay back in five years; I can do those sums. The public are starting to think more about how their vehicles pay back. One of the challenges that we have had in the past is that they look only at the ticket price of a car and not necessarily at the fuel savings. I believe that is changing and that the market is changing. More and more vehicles are leased. We should encourage that process and keep it going, but that means having a longer-term vision.

Things like duty on the fuels that we use, including electricity, are questions that get raised in people’s minds. One of the most important things is that over the last 10 years we have had some coherence about where we have been trying to go. That has paid dividends in terms of looking at the automotive industry and how it is moving forward. We really have to maintain that coherence of vision in terms of the carbon reduction trajectory and how we are going to continue support and possibly reduce it over time, but giving a vision allows people to make calculations and to make a conscious decision about when and how they change their behaviour.

Q154 Chloe Smith: I am really pleased that you came on to the point about duty. There is no such thing as support, either in terms of grants or in terms of hordes of civil servants busily writing reports, without somebody collecting taxes to pay for it. How do you solve the problem of disappearing VED?

Andy Eastlake: VED is one issue. The statistics now are that 60% of new cars do not pay VED in their first year. I was surprised by how influential VED is. Even at a relatively low level—£20—people think about it. People of a certain generation think very seriously about the VED on their car. That is a real challenge. VED needs to be looked at in a coherent way, but it ripples out into so many other areas that it is not something we can do overnight.

Q155 Chloe Smith: Given a blank sheet of paper, would you combine it with other taxes, for example?

Andy Eastlake: There is a role for VED. We now have to look at other options for taxation for motoring—perhaps a more coherent package looking at how much we use the vehicles, whether it becomes road user charging, or other unspeakable terms. Clearly, with electric vehicles, there is a significant impact on Treasury takings and on VED. Everyone understands that something has to change, but almost worse than that is not knowing what we can do about it. We really need to be engaging in discussion and planning a long-term trajectory. The tools are there, but we do not quite know how to use them yet in order to get to where we need to be.

Q156 Chloe Smith: Dr Herron, how do you solve a problem like VED?

Dr Herron: I would turn it around the other way. The impact of bringing in zero-emission vehicles will offset completely any lost revenue. In my region alone, 1,200 people a year die from diesel particulates. If you can remove congestion, the inability to use car parks correctly and the health problems, and you can look at this in a different way, the numbers will stack up.

Q157 Chloe Smith: Have you done research to that end?

Dr Herron: We are starting to do that, for another reason, tied in with OLEV. We want to try to measure the impact on the economy of taking away all the health and congestion problems that the new technology would allow us to address, as opposed to a blunt tool like VED. The alternative is that you have to treat a vehicle as a vehicle and charge it on something like miles driven.

Q158 Chloe Smith: My final question is a topical one. Last week we heard from National Grid about what they have to do to manage through the winter. Presumably, with greater use of electric vehicles, there is a greater call on the grid. Can you tell us a little about what research you have done on that avenue? What are the impacts of what you are calling for?

Dr Herron: The research we have been doing concerns the impact on the local grid: will the transformers melt? There has been work done on the national grid. I believe that the grid can take a million vehicles before it has a problem. The point that I would make is

that the message is there; they are coming and they are going to be there, so we need a strategy to put capacity in place for them.

Andy Eastlake: The grid is very important. We need to think holistically about all the energy sources for all the mobility that we are trying to achieve. The typical household uses a similar amount of energy in their motoring and at home; it is on that sort of scale. As Colin said, if we converted to electric vehicles, we would suddenly be doubling domestic demand. We need to remember that all of our activity to make conventional vehicles more efficient, whether through low rolling resistance tyres or efficiency in the rolling and the engines, does help. Reducing the energy consumption of every minute component on the vehicle is exactly what is going on at the moment; a really comprehensive view of every component is happening. That all helps.

Chair: The message from you seems to be long-term vision, consistency and look at the bigger picture. Thank you both very much.