House of Commons

Transport Committee

Zero emission vehicles

First Report of Session 2021–22

Report, together with formal minutes relating to the report

Ordered by the House of Commons
to be printed 20 July 2021

HC 27
Published on 28 July 2021
by authority of the House of Commons

Transport Committee

The Transport Committee is appointed by the House of Commons to examine the expenditure, administration, and policy of the Department for Transport and its associated public bodies.

Current membership

Huw Merriman MP *(Conservative, Bexhill and Battle)* (Chair)

Ben Bradshaw MP *(Labour, Exeter)*

Ruth Cadbury MP (*Labour, Brentford and Isleworth*)

Lilian Greenwood MP (*Labour, Nottingham South*)

Simon Jupp MP *(Conservative, East Devon)*

Robert Largan MP *(Conservative, High Peak)*

Chris Loder MP *(Conservative, West Dorset)*

Karl McCartney MP *(Conservative, Lincoln)*

Grahame Morris MP (*Labour, Easington*)

Gavin Newlands MP *(Scottish National Party, Paisley and Renfrewshire North)*

Greg Smith MP *(Conservative, Buckingham)*

Powers

The committee is one of the departmental select committees, the powers of which are set out in House of Commons Standing Orders, principally in SO No 152. These are available on the internet via www.parliament.uk.

Publication

Committee reports are published on the Committee's website at www.parliament.uk/transcom and in print by Order of the House.

Committee staff

The current staff of the Committee are Nick Beech (Committee Clerk), Estelle Currie (Senior Media Officer), Matt Eaton (Committee Specialist), Rosalind KennyBirch (Committee Specialist), Lewis Pickett (Committee Specialist), Wafia Zia (Second Clerk), Damith Rajakaruna (Committee Operations Manager) and Mandy Sullivan (Committee Operations Officer)

Contacts

All correspondence should be addressed to the Clerk of the Transport Committee, House of Commons, London SW1A 0AA. The telephone number for general enquiries is 020 7219 3266; the Committee's email address is transcom@parliament.uk.

You can follow the Committee on Twitter using @CommonsTrans

Contents

Summary

In November 2020, the Government published its *Ten Point Plan for a Green Industrial Revolution*, in which it committed to ending the sale of new petrol and diesel cars and vans by 2030. All new vehicles will be required to have 'significant zero emission capability' (including plug-in hybrids and full hybrids) from 2030 and be 100% zero emission from 2035. However, to ensure that the Government has set achievable targets, a clear policy framework is now required to ensure that industry can deliver the vehicles and charging infrastructure needed to meet the Government's ambition.

Uptake of zero emission vehicles

- If the Government is to reach its 2030 and 2035 phase-out date targets, it will need to incentivise car manufacturers to sell an increasing number of zero emission vehicles (ZEVs) through a ZEV mandate. However, it must adopt a technology-neutral approach to the transition to ZEVs and explore the potential of alternative fuels, such as hydrogen or other alternatives to petrol and diesel, where possible.

Charging infrastructure

The Government must:

- support sub-national transport bodies and local authorities to deliver sufficient and well-maintained charging infrastructure solutions tailored to local needs;
- ring-fence a portion of the £90 million local charging scheme so local authorities can employ dedicated 'charge point champions' to deliver local charging infrastructure strategies;
- identify and address under-provision at locations outside the strategic road network, where grid connection costs and grid upgrades are expensive and the business case for investment is weak;
- amend the wayleave regime for installing charging infrastructure to ensure that that regime does not act as a barrier to roll-out;
- protect the consumer from excessive costs when charging in public; and
- address the discrepancy between the 5% VAT incurred for home charging and 20% VAT for on-street.

Managing energy demand and smart charging

- The Government must mandate that industry uses price as a lever to move consumer behaviour away from conventional refuelling habits towards 'a little but often' approach.

1 Introduction

1. It is estimated that the transport sector accounted for 27% of UK greenhouse gas emissions (GHG) in 2019.[1] The major source of those emissions was petrol and diesel consumption in road transport.[2] Carbon dioxide (CO_2) emissions from transport decreased by 19.6% in 2020 due to national lockdowns during the coronavirus pandemic.[3] Although the long-term effects of the pandemic on transport are currently obscure, car usage has recovered faster than public transport modes and appears to be returning to pre-pandemic levels.[4] New car sales decreased by 30% in 2020, but consumer confidence may be returning.[5] The Climate Change Committee (CCC), an independent, statutory body established under the Climate Change Act 2008, recommended that the Government and the automotive sector should prioritise sales of electric vehicles, wherever possible.[6]

Phasing out sales of new petrol and diesel cars and vans

2. In 2018, the UK Government published its *Road to Zero Strategy,* which set out the Government's long-term plans for the transition to zero emission road transport. The strategy committed to ending the sales of all new conventional cars and vans by 2040.[7] Since then, the Government has set a legally binding target to reduce net GHG emissions by 100% relative to 1990 levels, or 'net zero', before 2050.[8] For the transport sector successfully to contribute to the net zero target, the CCC recommended that all new cars and vans should be zero emission by 2035 at the latest, or 2030 if possible.[9] In February 2020, the Government launched a consultation on bringing forward the phase-out date in line with the CCC's recommendation. In its 2020 progress report to Parliament, the CCC reassessed the phase-out date and recommended that sales of all new vehicles capable of producing exhaust emissions, including plug-in hybrids (PHEVs), should end by 2032.[10]

3. In November 2020, the Government published its *Ten Point Plan for a Green Industrial Revolution*, which brought forward the date to end the sale of new petrol and diesel cars and vans to 2030. All vehicles will be required to have 'significant zero emission capability' (including PHEVs and full hybrids) from 2030 and be 100% zero emission from 2035.[11] Rachel Maclean MP, Parliamentary Under Secretary of State at the

1 The transport sector consists of emissions from road transport, railways, domestic aviation, shipping, fishing, and aircraft support vehicles. The estimates for other sectors are 21% from energy supply, 17% from business, 15% from the residential sector, 10% from agriculture and the remaining 10% from other sectors such as waste management and industrial processes. Department for Business, Energy and Industrial Strategy, *2019 UK Greenhouse Gas Emissions, Final Figures*, 2 February 2021, p.13

2 Ibid, Cars represented 55% of domestic transport emissions in 2019. See DfT, Table ENV0201 Greenhouse gas emissions by transport mode: United Kingdom, 1990–2018, *Energy and environment: data tables*, 17 December 2020

3 Department for Business, Energy and Industrial Strategy, *2020 UK greenhouse gas emissions, provisional figures*, 25 March 2021, p.1

4 Climate Change Committee, *Progress in reducing emissions 2021 Report to Parliament*, June 2021, p.76

5 Ibid, p.77, "*One in ten new car sales is now electric*", The Times, 6 July 2021

6 CCC, *Progress in reducing emissions 2021 Report to Parliament*, June 2021, p.77

7 HM Government, *The Road to Zero Next steps towards cleaner road transport and delivering our Industrial Strategy*, July 2018, p.2

8 Climate Change Act 2008, Schedule 1

9 CCC, *Net Zero: The UK's contribution to stopping global warming*, May 2019, p.34

10 CCC, *Reducing UK Emissions: 2020 Progress Report to Parliament*, 25 June 2020

11 The Government forecasts that accelerating the shift to zero emission vehicles could deliver carbon savings of around 300 Mt CO2 equivalent to 2050. HM Government, *Ten Point Plan for a Green Industrial Revolution*, November 2020

Department for Transport (DfT), told us that the decision to bring forward the phase-out dates to 2030 and 2035 was based on "a vast amount of analysis" and engagement with industry.[12] The Government's consultation included 1,478 responses from individuals and 173 responses from organisations.[13] Several vehicle manufacturers have announced plans to manufacture electric vehicles.[14] However, a clear policy framework is now required to ensure that industry can deliver the vehicles and charging infrastructure needed to meet the Government's ambition.[15]

4. Transitioning to electric vehicles will not be sufficient to achieve the Government's net zero ambitions.[16] Ending the sales of new petrol and diesel cars and vans will need to be accompanied by other policies to decarbonise transport. Three weeks after our final evidence session, the Government published its long-awaited Transport Decarbonisation Plan (TDP), originally set to be published in 2020 and then delayed until Spring 2021. The TDP is an important policy document that plays a key role in informing the Government's policy framework for the transition to zero emission vehicles (ZEVs). Alongside the TDP the Government has published two other critical documents to the delivery of ZEVs. Those documents are:

- Green Paper on a New Road Vehicle CO_2 Emissions Regulatory Framework for the United Kingdom (consultation closes 22 September 2021); and
- Transitioning to zero emission cars and vans: 2035 delivery plan.

The third critical document, an electric vehicle charging infrastructure strategy, is due to be published before the UK hosts the UN Climate Change Summit (COP26) in November.

5. We received written and oral evidence on vehicle sharing. According to Transport & Environment, the average car in the UK is parked for more than 95% of the time, with some 29% of vehicles driving less than 5,000 miles in a year.[17] Transport & Environment argued that a large proportion of car owners would benefit financially by not owning their vehicles and instead switching to a car club (or car sharing scheme).[18] Car clubs have the potential to offer an accessible and affordable alternative to car ownership for drivers who want to switch to electric vehicles.[19] Car clubs also offer environmental benefits by reducing the number of cars on the road.[20] Car clubs could also contribute to reduced congestion and an increase in public transport and active travel.[21] However, the cost savings associated with running electric vehicles accrue to the car club customer

12 Q73 (Rachel Maclean MP)
13 The organisations included vehicle manufacturers, companies with a large fleet of vehicles, trade and professional associations, companies throughout the automotive supply chain, charge point operators, energy companies, environmental groups, charities, academia, consumer organisations, and local authorities and public bodies. See Department for Transport and OZEV, Outcome and response to ending the sale of new petrol, diesel and hybrid cars and vans, accessed 21 July 2021
14 *Electric Vehicles and Infrastructure*, CBP-7480, House of Commons Library, 23 June 2021, p.23
15 Q3 (Roger Hunter)
16 Transport for the West Midlands (EVP0078), The Transport Planning Society (EVP0074), Green Alliance (EVP0125), Bath and Northeast Somerset Council (EVP0079), Transport for Quality of Life (EVP0080), Greener Transport Solutions (EVP0094), Institute for Public Policy Research (EVP0065)
17 Transport & Environment, Shared Vision: Tackling the barriers to electric car clubs in the UK, accessed 19 July 2021
18 Ibid
19 Transport & Environment, *Barriers and opportunities for shared battery electric vehicles*, 14 January 2021, p.1
20 Transport & Environment, Shared Vision: Tackling the barriers to electric car clubs in the UK, accessed 19 July 2021
21 Transport & Environment, *Barriers and opportunities for shared battery electric vehicles*, 14 January 2021

and not the operator, meaning that any profitable business model is potentially hindered by the high upfront cost of purchasing vehicles.[22] The British Vehicle Rental and Leasing Association (BVRLA) argued that that effect could be mitigated by introducing zero VAT rates on electric vehicles purchased by car clubs.[23] The Institute for Public Policy Research (IPPR) told us that the Government should support the transition to ZEVs through schemes that incentivise car owners to trade their internal combustion engine (ICE) models for sustainable travel options, including car clubs, rather than a new car.[24] Transport & Environment argued that the charging infrastructure network has been focused on residential and fleet charging.[25] This is reflected in current policy with car clubs being exempt from the on-street residential charging scheme (ORCS). Groupe Renault told us that the Government should invest in community charging.[26] Transport for West Midlands suggested that infrastructure to help all vehicles to decarbonise requires an integrated transport planning system.[27] Shared mobility hubs could provide facilities for a range of users and vehicles, from goods vehicles and buses to e-bikes, e-scooters and EV car clubs.[28] The Minister told us that the Government is supporting car clubs through its current package of incentives, which includes the plug-in car grant.[29] The Transport Decarbonisation Plan committed the Government to supporting car clubs to go fully zero emission. The Government will publish guidance for local authorities to support shared car ownership, including the provision of car club infrastructure.[30]

Zero emission vehicles terminology

6. We use the term 'zero emission vehicle' (ZEV) to mean an electric vehicle that produces zero CO_2 or nitrogen oxides (NO_X) from the exhaust when driving. However, this terminology does not cover all electric vehicles. Although hybrids have varying zero emission ranges—the distance that they can travel in pure electric mode—they are not zero emission vehicles, because they still burn fossil fuels.[31] For the purpose of our inquiry, 'electric vehicles' (EVs), also known as 'ultra-low emission vehicles' (ULEVs), are any vehicle powered by a rechargeable battery. This covers:

- Battery Electric Vehicles (BEVs), or 'pure electric' vehicles, which use the battery as the only power source;
- Plug-in hybrid electric vehicles (PHEVs), which switch between a battery and an internal combustion engine (ICE). These typically have a smaller battery and a lower zero emission range;
- Hybrid electric vehicles (HEVs), or 'full hybrids' which do not plug in to the electricity grid, have much smaller batteries and recharge while driving; and

22 BVRLA (EVP0052)
23 Ibid
24 Institute for Public Policy Research (EVP0065)
25 Transport & Environment, *Barriers and opportunities for shared battery electric vehicles*, 14 January 2021, p.2
26 Groupe Renault (EVP0041)
27 Transport for West Midlands (EVP0078)
28 Ibid, Bath and Northeast Somerset Council (EVP0079)
29 Q163 (Rachel Maclean MP)
30 Department for Transport, *Decarbonising Transport*, July 2021
31 CCC, *Policies for the Sixth Carbon Budget and Net Zero*, December 2020, p.60

- Fuel cell electric vehicles (FCEVs), which use on-board hydrogen fuel cells to generate electricity rather than plugging in to the electricity grid to recharge.[32]

Legacy petrol- and diesel-powered motoring

7. Although the Government is committed to ending the sale of new petrol and diesel cars and vans, the DfT must take account of legacy petrol and diesel-powered motoring. The 2030 phase-out date will not eliminate ICE vehicles from the used car market, meaning that drivers may continue to opt for those vehicles.[33] The drivers of legacy vehicles may be on lower incomes and should not be penalised if they cannot afford to switch to electric vehicles, especially if a car is their primary means of transport.[34] Many older, classic petrol and diesel cars are also likely to remain on the roads.[35][36]

Our inquiry

8. We launched an inquiry in December 2020 called *Zero emission vehicles and road pricing*. The inquiry was split into two parts, with ZEVs forming the first part. We have already received evidence on the merits and challenges of introducing a road pricing scheme to replace the £40 billion annual income from Fuel Duty and Vehicle Excise Duty, the loss of which will be a likely consequence of the transition to ZEVs. We will take further evidence on road pricing, which will lead to a subsequent Report.

9. We invited written evidence on accelerating the shift to ZEVs, including the feasibility of the 2030 and 2035 phase-out dates, the actions required by the Government and private operators to increase uptake of ZEVs and provision of charging infrastructure, the challenges around decarbonising buses and the Government's ambition to end the sale of new heavy goods vehicles (HGVs). In response to our call for evidence, we received a total of 148 submissions (15 of which were confidential) and held three oral evidence sessions between April and June 2021. We met policy think-tanks, charge point operators, National Grid, sub-national and local transport bodies, Rachel Maclean MP, Parliamentary Under Secretary of State and Richard Bruce, Director of Environment and Future Mobility at the Department for Transport.

10. We visited ChargePoint's research and development lab in Berkshire in May 2021 to meet industry professionals to discuss the challenges in providing adequate charging infrastructure and to learn how charge point technology works. We also launched a survey via social media in May 2021 asking drivers to tell us what they thought about purchasing electric vehicles. A total of 979 people responded to the survey, the results of which are set out in Annex A. We would like to thank everyone who contributed to our inquiry.

32 *Electric Vehicles and Infrastructure*, CBP-7480, House of Commons Library, 23 June 2021, p.7
33 Petrol Retailers Association (EVP0023)
34 Robert Bosch Ltd (EVP0017), Petrol Retailers Association (EVP0023) Association of Directors of Environment, Economy, Planning and Transport (EVP0036), GMB Trade Union (EVP0116), LV General Insurance (EVP0114)
35 London Forum of Amenities & Civic Societies (EVP0019)
36 According to an environmental impact study commissioned by HERO-ERA, the historic and classic motor industry in the UK is comprised of sectors amounting to some £18.3 billion and employs 113,000 people across the supply chain. See HERO, Environmental Impact Study Launch, accessed 19 July 2021

2 Uptake of zero emission vehicles

11. In 2020, total car sales in the UK decreased by 30%, perhaps due to the coronavirus pandemic. However, battery electric vehicle (BEV) registrations rose by 185.9% to take a record 6.6% market share and ultra low emission vehicles, which includes both BEVs and plug-in hybrids, took some 11% of market share.[37] However, Norway, Iceland and Sweden are leading the way in Europe, recording market shares for plug-in vehicles of some 75%, 45% and 32% respectively in 2020.[38] The vast majority of BEV registrations in the UK were made by business or fleet purchasers, with just 2.1% of BEV registrations made by private consumers.[39] The Society of Motor Manufacturers and Traders (SMMT) told us that increasing consumer uptake is essential to accelerating the transition to ZEVs.[40]

12. The Government has introduced various incentives to stimulate the new EV market. These incentives include favourable company car tax rates until 2024–25 and £582 million to extend plug-in grants for new electric vehicles until March 2023.[41] The Department has argued that because fleet operators are major suppliers of second-hand vehicles, helping them to transition to ZEVs will support the growth of the second-hand market.[42] The Government recently reduced the plug-in car grant from £3,000 to £2,500 per car and the price cap from £50,000 to £35,000.[43]

Second-hand electric vehicle market

13. A sustainable second-hand electric vehicle market is crucial to the roll-out of ZEVs.[44] Used cars make up a significant share of vehicle sales. In 2019, 2.3 million (22%) new cars were registered compared with 7.9 million (78%) used car sales.[45] In 2020, overall used vehicle sales in the UK declined by 14.9%. However, used battery electric vehicle sales increased by 29.7% with some 19,000 units sold. This still only represented a fraction of market share at 0.3%.[46] The second-hand EV market is critical in providing market access for people who cannot afford to purchase a brand-new electric car.[47] Green Alliance told us that lower-income households could benefit from significant total cost of ownership savings—the real cost of running a vehicle over the course of ownership—of between £700 and £2,300 for a medium-sized, second-hand BEV. Third-hand owners may save between £3,500 and £5,600.[48] In our survey of 979 drivers (see Annex A), 56% said that they would consider buying a second-hand electric vehicle. However, consumers still see the initial advertised price of EVs as a barrier to purchasing both new and second-hand models.[49]

37 SMMT (EVP0136), SMMT, December 2020 New Car Registrations, accessed 15 July 2021
38 World Economic Forum, Chart: Which countries have the most electric cars?, accessed 19 July 2021
39 SMMT, Blueprint for the electric vehicle revolution, accessed 15 July 2020
40 SMMT (EVP0136)
41 Department for Transport (EVP0120)
42 UIN 178600, (on Electric Vehicles: Sales), 12 April 2021
43 "*Plug-in car, van and truck grant to be targeted at more affordable models to allow more people to make the switch*", GOV.UK, 18 March 2021
44 Q3 (Sarah Owen-Vandersluis)
45 *Electric Vehicles and Infrastructure*, CBP-7480, House of Commons Library, 23 June 2021, p.14
46 SMMT, UK used car market declines -14.9% as coronavirus lockdowns curb 2020 sales, accessed 19 July 2021
47 Q4 (Caterina Brandmayr), RAC Motoring Services (EVP0013), Bright Blue (EVP0032)
48 Green Alliance (EVP0151)
49 Bright Blue (EVP0032), RAC Motoring Services (EVP0013), Electric Vehicle Association England (EVP0135)

14. Auto Trader data show that the advertised, or upfront, costs of younger used electric vehicles are more expensive than petrol and diesel cars, with the price gap getting much closer after a car is three years old and older.[50] No incentives or support are currently provided for the used EV market.[51] Bright Blue recommended that the Government introduce a plug-in vehicle grant of at least £2,000 to help people on lower incomes purchase a used EV. Similar purchase incentives for second-hand EVs have been introduced in the Netherlands and France.[52] Another potential incentive is an interest-free loan for second-hand EV purchases, such as the scheme introduced by the Scottish Government in September 2020.[53] Ed Birkett, Senior Research Fellow at Policy Exchange, argued that purchase incentives for second-hand EVs would increase the price of those vehicles and that any incentives should be targeted at those who need them most.[54]

15. Most new vehicles are purchased using finance schemes with the cost of leasing based on the estimated residual value—in other words, the second-hand value—of the vehicle at the end of the lease.[55] The BVRLA told us that by 2025 the number of used BEVs on the market is expected to be more than 250,000 and that they are entering the used market at a significant higher price than comparable ICE vehicles. That could lead people buying cars on the used market to opt for cheaper ICE vehicles.[56] Representatives from the motor finance and leasing sector told us that vehicle finance companies, concerned about potential losses, will typically set their residual values for EVs at a considerably lower level than that for ICE vehicles. This leads to higher monthly payments for customers looking to lease or finance a new BEV.[57] If zero emission vehicles remain expensive to lease on the new market, this will have a detrimental effect on the development of the second-hand market.

16. The Government's position is that stimulating the early EV market will ensure that plenty of vehicles are in circulation and that those vehicles will filter through to the second-hand market.[58] The Minister argued that the Government's strategy to stimulate the early market is working. She cited 500,000 electric vehicles on the road today in the UK as proof of the success of this approach. Richard Bruce asserted that residual values are improving for second-hand electric vehicles and that a healthy second-hand market is developing.[59] However, the Department did not set out the evidence base underpinning its belief in the future operation of the second-hand market in older electric vehicles.

17. **A healthy used electric vehicle market is critical to ensuring that electric vehicles are not the sole preserve of people who can afford new models. The Government's position is that current incentives to stimulate the sale of new EVs are sufficient to support the development of the second-hand EV market. However, electric vehicles that will be traded on the second-hand market in three to five years' time are likely**

50 Auto Trader, *Monthly Market Intelligence*, April 2021
51 BVRLA (EVP0052)
52 Bright Blue (EVP0032)
53 Energy Savings Trust, Used Electric Vehicle Loan, accessed 15 July 2021
54 Q12 (Ed Birkett)
55 Q11 (Sarah Owen-Vandersluis), Q91 (Richard Bruce), BVRLA (EVP0052), Finance and Leasing Association (EVP0069)
56 BVRLA (EVP0052)
57 BVRLA (EVP0052), Finance and Leasing Association (EVP0069)
58 Q90 (Rachel Maclean MP)
59 Q91 (Richard Bruce)

to be more expensive to buy upfront than comparable ICE models. To drive mass consumer uptake of ZEVs, the Government must ensure that the market facilitates the supply of affordable new and used electric vehicles.

18. **In order to ensure that the Government achieves the targets set out in the Transport Decarbonisation Plan, it may need to intervene to support the second-hand market in electric vehicles until price parity with comparable ICE vehicles is reached.**

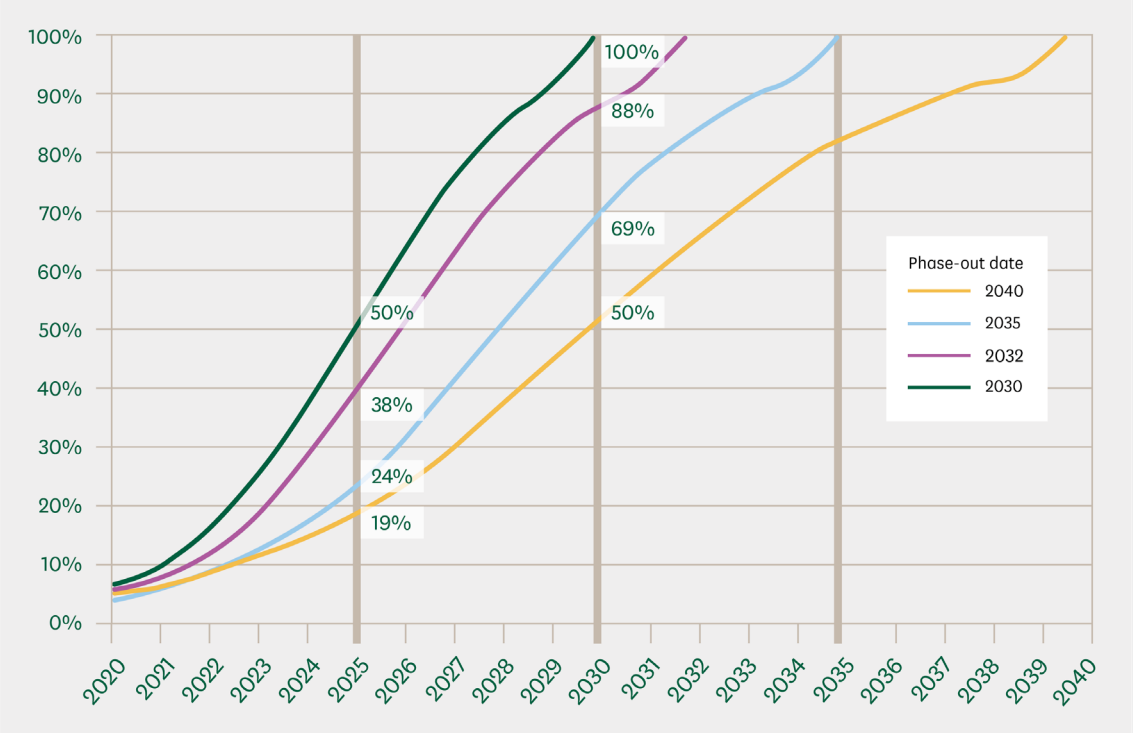
Zero emission vehicle mandate

19. Although sales have increased in recent years, the uptake of ZEVs needs to accelerate throughout the 2020s to reach the Government's phase-out dates and meet the UK's emissions reduction targets.[60] According to the Climate Change Committee (CCC), for the transition to ZEVs to have a meaningful impact on the UK's net zero ambitions, battery electric vehicles must comprise almost 50% of new car sales by 2025, with hybrid technology playing a limited role (figure 1 outlines the projected sales curves for different phase-out dates). To achieve this, the CCC recommended that the Government should, as a priority, introduce a zero emission vehicle mandate. A ZEV mandate would require car manufacturers to sell an increasing proportion of ZEVs over the next decade, reaching 100% by 2030.[61]

20. Several witnesses to our inquiry supported the introduction of a ZEV mandate.[62] A mandate would incentivise specialist ZEV manufacturers to compete in the UK market, because such specialist ZEV manufacturers would be able to sell credits to other manufacturers. Under such a system, each electric vehicle sold would generate a set number of tradeable credits based on the vehicle's zero emission range.[63] Manufacturers would be required either to sell an increasing number of ZEVs each year, reaching some 100% by 2030 or to buy credits from other manufacturers.[64] The trading of credits should facilitate competition between manufacturers while facilitating the market to grow in line with the Government's 2030 phase-out date.[65] Because the Government has clarified the phase-out date, the credit requirements could be set out in advance, providing even more certainty for manufacturers, the public and investors. The 2030 deadline also provides a clear end date, after which a ZEV mandate would no longer be required.[66] Financial penalties could also be introduced on manufacturers that fail to meet compliance targets.[67]

60 SMMT (EVP0136), Green Alliance (EVP0125)
61 CCC (EVP0118)
62 Ibid, Q10 (Ed Birkett), Q15 (Caterina Brandmayr), Q11 (Tanya Sinclair), Green Alliance (EVP0125), Policy Exchange (EVP0016), Energy UK (EVP0053), ChargePoint (EVP0010), Transport & Environment (EVP0046), Transport for Quality of Life (EVP0080)
63 This is the range that an electric vehicle can travel without re-charging, or for hybrid models, using the internal combustion engine.
64 Policy Exchange (EVP0016), Energy UK (EVP0053)
65 Energy UK (EVP0053)
66 Policy Exchange, *Route '35*, 22 July 2020
67 ChargePoint (EVP0010), Transport & Environment (EVP0046)

Figure 1: Sales curves for different phase-out dates



Source: Transport & Environment analysis, Electromobility (EVP0152)

21. Alongside the Transport Decarbonisation Plan, the Government published a Green Paper on the UK's post-EU regulatory regime for CO_2 emissions from new road vehicles, which considered a ZEV mandate.[68] Some regional and national governments have successfully implemented a ZEV mandate, such as California, two Canadian Provinces and China.[69]

22. The BVRLA does not support the introduction of a ZEV mandate. It called for policy measures to be aligned with European markets, where grants and incentives have apparently facilitated increases in market share for electric vehicles.[70] The SMMT stressed that the Government should focus on longer-term consumer incentives to drive the ZEV market.[71] Green Alliance supported the introduction of a ZEV mandate and told us that purchase incentives should remain in place to encourage the uptake of new electric vehicles, which would support the second-hand market.[72] It highlighted that new, medium-sized electric vehicles are already cheaper on a total cost of ownership basis than ICE equivalents due to the plug-in car grant. It argued that removing subsidies would unhelpfully increase price disparities with ICE vehicles.[73]

68 Department for Transport, CO2 emissions regulatory framework for all newly sold road vehicles in the UK, CP 499, July 2021
69 Policy Exchange (EVP0016), Energy UK (EVP0053), ChargePoint (EVP0010), Policy Exchange, *Route '35*, 22 July 2020
70 BVRLA, Electric Vehicles, accessed 16 June 2021
71 SMMT (EVP0136)
72 Q15 (Caterina Brandmayr), Green Alliance (EVP0151)
73 Green Alliance (EVP0151)

23. A ZEV mandate would be a cost-effective way in which to support the uptake of ZEVs compared with taxpayer-funded incentives.[74] The UK taxpayer currently contributes approximately £135 million a year to the plug-in car grant.[75] Witnesses argued that although the plug-in car grant has stimulated the early EV market, the Government should abandon purchase incentives to drive the sales of new EVs.[76] Policy Exchange told us that to continue with the grant, alongside other incentives such as favourable tax treatment for ZEVs, would be "unnecessarily expensive" as the UK recovers from the coronavirus pandemic.[77] Sarah Owen-Vandersluis, Head of Public Sector Mobility at KPMG, suggested that some of the funding used for the plug-in car grant could be repurposed to support the roll-out of charging infrastructure.[78] A ZEV mandate would encourage global vehicle manufacturers to invest in electric vehicle production for the UK market, increasing vehicle supply, which in turn would reduce the cost of those vehicles for the consumer.[79]

24. Some witnesses called on the Government to set progressively tighter CO_2 emissions standards for new road vehicles over the next decade.[80] However, regulation based on overall exhaust emissions standards would be insufficient to achieve the target phase-out date.[81] CO_2 emissions regulation should either be replaced by or work with a ZEV mandate.[82] Without a ZEV mandate, industry would be left to scale up ZEV production, imports, and sales targets by itself.[83] However, by introducing a ZEV mandate, the Government would provide a strong message to business, consumers and international partners that the UK is serious about its net zero ambitions.[84] That is particularly important, because the UK is hosting COP26 and can exercise international leadership.

25. The Minister told us that the Government has used taxpayers' money to stimulate the early ZEV market. However, with purchase incentives such as the plug-in car grant being phased out, she acknowledged that something else is required to ensure that industry supplies sufficient ZEVs to achieve the Government's 2030 ambition.[85] Richard Bruce said that the critical factor is not the mechanism used, such as a ZEV mandate or regulation, but the shape of the sales curve. He argued that an overly aggressive approach would increase the price of the vehicles, meaning people would hold on to fossil fuel models for longer, which in turn would produce more CO_2.[86] In its recent Green Paper on the CO_2 emissions regulatory framework, the Government stated that a ZEV mandate combined with a CO_2 emissions target is its preferred option.[87]

74 Policy Exchange (EVP0016), Energy UK (EVP0053)
75 Policy Exchange, *Charging Up*, 2 February 2021
76 Q15 (Sarah Owen-Vandersluis, Ed Birkett)
77 Policy Exchange (EVP0016)
78 Q11 (Sarah Owen-Vandersluis)
79 Q15 (Caterina Brandmayr), Green Alliance (EVP0125), Energy UK (EVP0053), ChargePoint (EVP0010)
80 Energy UK (EVP0053), Shell UK (EVP0027), CCC (EVP0118)
81 Transport & Environment (EVP0046), Energy UK (EVP0053), Green Alliance, *Accelerating the electric vehicle revolution: Why the UK needs a ZEV mandate*, 26 May 2021
82 Transport & Environment (EVP0046), Energy UK (EVP0053), CCC (EVP0118)
83 ChargePoint (EVP0010)
84 Energy UK (EVP0053)
85 Q107 (Rachel Maclean MP)
86 Q106 (Richard Bruce)
87 Department for Transport, CO2 emissions regulatory framework for all newly sold road vehicles in the UK, CP 499, July 2021, p.28

26. **A zero emission vehicle mandate would:**

- **be revenue neutral;**
- **provide certainty to allow manufacturers to invest in the UK and supply a sufficient volume of ZEVs to meet the UK's decarbonisation commitments;**
- **reduce costs for consumers by increasing the supply of electric vehicles; and**
- **free taxpayers from the annual £135 million cost of the plug-in car grant.**

27. ***In order to achieve its 2030 and 2035 targets, the Government must introduce a ZEV mandate to incentivise manufacturers to sell an increasing proportion of ZEVs or to purchase tradeable credits year-on-year, reaching some 100% ZEV sales by 2030.***

Hybrid technology after 2030

28. Although the Government pledged to end the sales of new petrol and diesel cars and vans by 2030, ahead of the CCC's recommended date of 2032, sales of full hybrids and plug-in hybrids with significant zero emission capability will be permitted until 2035. The Government's recently published consultation on CO_2 emissions for new road vehicles will address the definition of 'significant zero emission capability'.[88]

29. The Government argued that hybrid vehicles are among the cleanest on the market today and play an important role in meeting interim carbon reduction targets.[89] However, notwithstanding reduced CO_2 emissions from the exhaust, several witnesses raised concerns about the potential carbon emissions that manufacturing electric vehicles could produce.[90] The Government added that hybrid vehicles support consumers in transitioning to ZEVs. It claimed that PHEVs contribute to behaviour change in how drivers refuel their vehicles and to building consumer confidence in battery technology.[91] Richard Bruce highlighted the "spectrum of options" and argued that allowing hybridisation to continue until 2035 would "allow phase-in for certain manufacturers, especially those who have a lot invested in hybrid technology."[92]

30. Several witnesses informed us that real-world driving emissions from PHEVs are two to four times higher than during test levels, which makes them comparable to conventional vehicles.[93] That is because drivers do not take full advantage of driving in electric mode.[94] PHEVs have a relatively limited electric-only range of some 25 miles, and they require frequent recharging to avoid using the internal combustion engine.[95] Energy UK told us that PHEVs are only used in their zero emission mode for around 37% of miles driven.[96]

88 Ibid, p.19
89 Department for Transport and OZEV, Outcome and response to the ending the sale of new petrol, diesel and hybrid cars and vans, accessed 21 July 2021
90 Parliamentary Advisory Council for Transport Safety (EVP0087), Living Streets (EVP0104), Confederation of Passenger Transport (EVP0018)
91 Department for Transport and OZEV, Outcome and response to the ending the sale of new petrol, diesel and hybrid cars and vans, accessed 21 July 2021
92 Q104 (Richard Bruce)
93 CCC (EVP0118), Energy UK (EVP0053), Q9 (Caterina Brandmayr)
94 Dr Steve Melia (EVP0006), Mr David Haggie (EVP0057), Chartered Institute of Logistics and Transport (EVP0096), University of Sheffield (EVP0112)
95 CCC (EVP0118)
96 Energy UK (EVP0053)

Green Alliance claimed that the Government's decision to allow the sale of hybrid vehicles until 2035 may be "a missed opportunity to turbocharge the transition to zero emission cars and vans."[97] Several witnesses told us that the Government should limit the sales of all hybrid vehicles between 2030 and 2035 to help the UK meet its decarbonisation commitments.[98]

31. Two car manufacturers told us that they are seeking clarity on what hybrid technology they can sell after 2030.[99] Honda Motor Europe asserted that its advanced hybrid technology (full hybrid and PHEVs) can already operate for long periods in zero emission mode and will deliver significant CO_2 emissions savings in the short and longer-term.[100] McLaren Automotive argued that the Government should ensure that hybrid technology is not "stigmatised in the short term" while it continues to play a key role for consumers and the automotive sector in the transition to ZEVs.[101] Sarah Owen-Vandersluis from KPMG warned that the lack of clarity around the transition for hybrid vehicles may also have a negative effect on residual values and the second-hand market.[102]

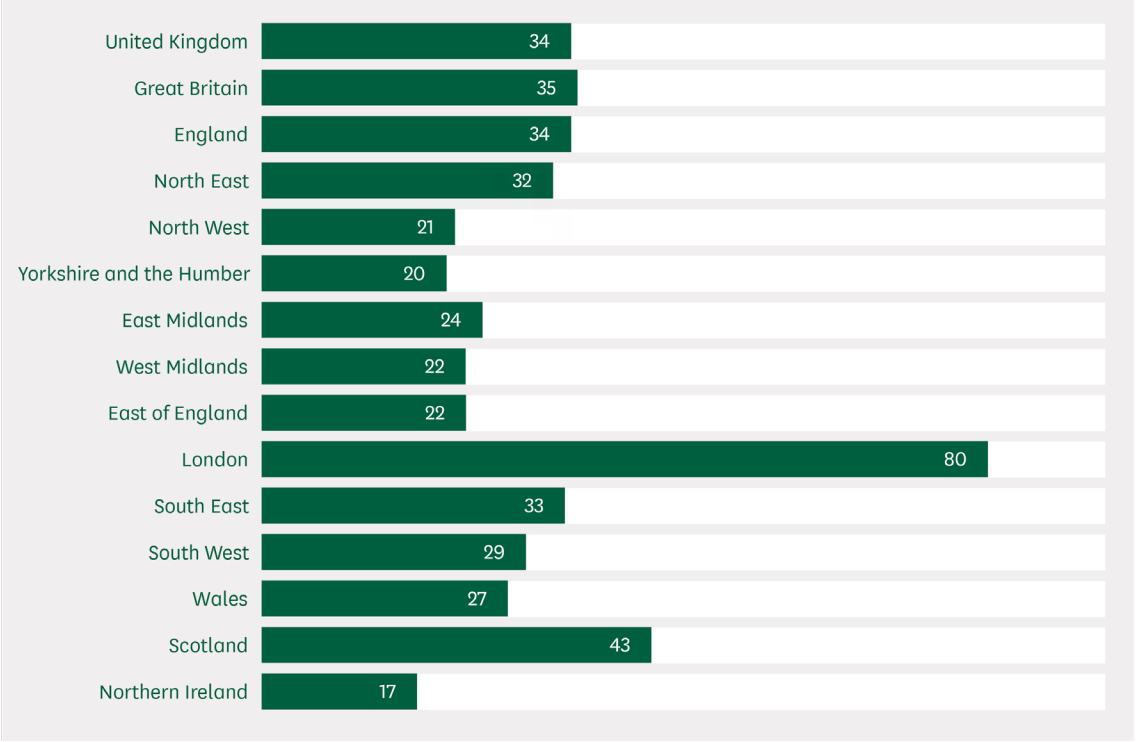
32. ***The Government must define 'significant zero emissions capability' for the automotive manufacturing industry, while ensuring that only the cleanest possible hybrid technology is available until 2035. It should also maintain a technology-neutral approach to the transition to ZEVs and explore the potential of alternative fuels, such as hydrogen or other alternatives to petrol and diesel, where possible.***

97 Green Alliance (EVP0125)
98 CCC (EVP0118), Green Alliance (EVP0125), Transport & Environment (EVP0046)
99 Honda Motor Europe (EVP0014), McLaren Automotive (EVP0114)
100 Honda Motor Europe (EVP0014)
101 McLaren Automotive (EVP0114)
102 Q11 (Sarah Owen-Vandersluis)

3 Charging Infrastructure

33. The transition from new fossil fuel cars and vans to ZEVs will depend on the timely roll-out of accessible and reliable charging infrastructure. In April 2021, 20,790 public charge points were available in the UK. Of those, 4,259 were rapid charging devices. DfT data show that the geographical distribution of charge points in the UK is uneven, with London and Scotland having more public charge points per 100,000 population than other areas of the UK (see figure 2).[103] Almost twice as many public rapid charge points per head of population are available in Scotland compared with London, with 11 and 6.5 chargers per 100,000 of population respectively.[104] Transport for the North told us that "deployment is a fraction of what it needs to be to hit 2030."[105] In a September 2020 poll of 17,628 drivers, 69% cited a lack of public charge points as a reason not to purchase an electric vehicle.[106] However, it remains to be seen whether the Government's current plans are enough to deliver the public charging infrastructure needed across all regions of the UK.

Figure 2: Charging devices in different regions of the UK per 100,000 population



Source: Department for Transport

34. Several witnesses commented on the number of charge points required by 2030, with estimates varying wildly between 280,000 and 9 million.[107] The CCC progress report to Parliament recommended that the Government should ensure the provision of 150,000 public charge points by 2025.[108] A recent Policy Exchange report stated that by 2030 the UK

103 Department for Transport and OZEV, *Electric vehicle charging device statistics: April 2021*, 11 May 2021
104 Ibid
105 Transport for the North (EVP0101)
106 The AA, Almost half of drivers thinking of buying an electric vehicle, accessed 15 July 2021
107 CCC (EVP0118), Policy Exchange (EVP0016), SMMT (EVP0136)
108 CCC, *Progress in reducing emissions: 2021 report to Parliament*, 24 June 2021

will need approximately 400,000 public charge points, requiring charge point operators to invest between £5 billion and £10 billion alongside the Government's £1.3 billion.[109] The report noted that the increase in EVs in the UK outpaced the growth in public charging infrastructure.[110] The ratio of EVs to public charge points in the UK is currently 10 EVs per charger, which is a similar ratio to Belgium and Ireland. The Netherlands, by contrast, has four EVs per public charger. However, this may be explained by drivers' reliance on public charging in the Netherlands.[111] The Government is confident that most EV drivers in the UK charge at home.[112] Some 71% (693) of drivers answering our survey (see Annex A) said that they expect to charge electric vehicles at home overnight. Several witnesses declined our invitation to estimate the number of chargers needed by 2030. Graeme Cooper, Head of Future Markets at National Grid, told us that there "is no magic bullet for the right answer to charging". Instead, he argued that it is more important to ensure "the right charger in the right space for the right duration that people are parking."[113] Charging speeds will vary depending on drivers' needs. For example, someone charging overnight might use a 7KW fast charger, which could take four to six hours. Those charging at destinations such as retail parks might use a 22KW fast charger for a couple of hours. People charging en route would require a rapid charge point, where charging could take about an hour using a standard 50KW rapid charger.[114]

35. The Government has committed £1.3 billion to the roll-out of charging infrastructure, including:

- £950 million for charge points along motorways and key A-roads;
- £275 million for homes, workplaces, and on-street charging; and
- £90 million for local infrastructure (to be launched by Summer 2022).[115]

In addition to this funding, the Government stated that it will provide guidance to local authorities to help facilitate the transition to ZEVs. The Government has also consulted on proposals to ensure that all new residential and non-residential buildings are fitted with charging infrastructure, with regulations to come in to force later in 2021.[116]

On-street charging and local authorities

36. Some 30% of households do not have access to off-street parking.[117] In 2017, the Government launched the on-street residential charging scheme (ORCS) to help local authorities install on-street charge points. Since its inception, more than 120 projects have benefitted from the scheme.[118] The National Audit Office (NAO) stated, however, that 32% of the £8.5 million allocated up to 2020 was unused. Although the Office for Zero Emission Vehicles (OZEV) consulted local authorities before setting up ORCS, the NAO

109 Policy Exchange, *Charging Up*, 2 February 2021
110 Ibid
111 Ibid
112 Q110 (Rachel Maclean MP)
113 Q7 (Graeme Cooper)
114 OVO Energy, Your complete guide to EV charging speeds: slow, fast and rapid charging explained, accessed 19 July 2021, pod point, How long does it take to charge an electric car, accessed 19 July 2021
115 Department for Transport (EVP0120)
116 Ibid
117 CCC (EVP0118), Arup (EVP0105)
118 Letter from Rachel Maclean MP, Parliamentary Under Secretary of State at the Department for Transport, to Huw Merriman MP, 2 July 2021

reported that the scheme "had been designed without sufficient consultation, and that as a result it was difficult to bid for."[119] In February 2021, the Government committed £20 million to extend ORCS into 2021–22. The Secretary of State for Transport also wrote to local authorities to encourage them to apply for the scheme.[120]

37. Several witnesses called for changes to the planning process to ensure that charge points are located in or near to new housing developments.[121] The Energy Saving Trust argued that local authorities could consider the Government's proposed building regulations for charge points as the "baseline" when reviewing their local plans.[122] However, the Government stated that, as of February 2021, only some 41% of local authorities have updated local plans in place.[123] The Planning Bill, announced in the Queen's Speech 2021, will aim to provide a faster and more modern planning system, which will ensure that vital infrastructure is delivered quickly across England.[124]

38. The Minister told us that the application criteria for ORCS requires local authorities to set out a strategic plan for charge points.[125] However, several witnesses argued that some local authorities need more resources and responsibilities for the roll-out of charging infrastructure.[126] Andrew Hickford, Project Manager at Leeds City Council, highlighted a lack of resource and revenue funding to reinforce capital spending, making it difficult to deliver charge points. He informed us that local authorities often do not have a "natural home" for electric vehicle charging and that projects are instead delivered by different departments such as "environmental health, transport, highways, or road safety."[127] Witnesses told us that local authorities will require a range of resources, such as procurement, commercial and legal services as well as education and planning to install and maintain charge points.[128]

39. Sub-national transport bodies told us that inconsistent local strategies might fragment the roll-out of infrastructure across the country.[129] For a co-ordinated and widespread network of electric vehicle charging infrastructure to be in place by 2030, regional and local transport bodies must play a strategic role in getting the right charge points in the right places.[130] Peter Molyneux, Major Roads Director at Transport for the North argued

119 National Audit Office, *Reducing carbon emissions from cars*, 26 February 2020, p 8
120 "*Government powers up electric vehicle revolution with £20 million chargepoints boost*", GOV.UK, 2 February 2021
121 North East England Chamber of Commerce (EVP0049), Midlands Connect (EVP0066), Bath and North East Somerset Council (EVP0079), Chartered Institute for Logistics and Transport (EVP0096), Transport for the North (EVP0101)
122 Energy Saving Trust, *Incorporating EV chargepoints into local planning policies for new developments*, April 2020, p.9
123 The Queen's Speech 2021, 11 May 2021
124 Ibid
125 Letter from Rachel Maclean MP, Parliamentary Under Secretary of State at the Department for Transport, to Huw Merriman MP, 2 July 2021
126 Q33 (Caterina Brandmayr), Policy Exchange (EVP0016), Robert Bosch Ltd (EVP0017), Association of Directors of Environment, Economy, Planning and Transport (EVP0036), North East England Chamber of Commerce (EVP0049), Midlands Connect (EVP0066), Bath and Northeast Somerset Council (EVP0079), Licensed Taxi Drivers' Association (EVP0109), GMB Trade Union (EVP0116), Uber (EVP0140), Bright Blue (EVP0032), Living Streets (EVP0104)
127 Q47 (Andrew Hickford)
128 Ibid, Q6 (Roger Hunter), Q20 (Sarah Owen-Vandersluis)
129 Midlands Connect (EVP0066), Transport for the North (EVP0101)
130 Transport for the North (EVP0101)

that sub-national transport bodies that cover large geographical areas can provide the evidence base and be "the conduit" between local authorities, the private sector and central Government.[131]

40. Several witnesses told us that a flexible approach is needed to identify suitable charging locations other than on-street residential charging.[132] Andrew Hickford argued that the average household vehicle travels fewer than 150 miles per week, so people only need to charge twice a week at most. That observation relates to the number of charge points that actually need to be installed on residential streets.[133] Witnesses told us that hubs that serve multiple users would mitigate problems around under-utilisation and street clutter.[134] Sarah Owen-Vandersluis from KPMG asserted that the "balance of charging locations" should take into account that people will plan their journeys around different options available for charging in different places.[135] Charge points at destination locations, such as retail parks, gyms and libraries, are key to encouraging people to adopt electric vehicles.[136]

41. The Department expressed confidence about the roll-out of charging infrastructure. Richard Bruce informed us that the private sector is already investing billions of pounds in installing charge points, including rapid chargers and charge points at destination locations. The Minister told us that the Government is already working with local authorities to deliver the on-street residential charging scheme (ORCS) and will continue to do so.[137] However, when we challenged the Minister on the underspend in the ORCS budget, she stated that many local authorities are applying for funding and that where the Department can see that uptake is low, it is her job to step in and offer support.[138] The Minister informed us that the scheme had been adapted to encourage larger projects, improve access to funding where there is limited electrical capacity, and increase the amount of funding per charge point from £7,500 to £13,000.[139] Richard Bruce said that the Energy Saving Trust offers support to local authorities on developing an EV charging infrastructure strategy. He also told us that the new £90 million local fund will be sufficiently flexible to fund resource capacity, if required.[140] However, this money is not yet available, and the allocation between resource and capital spending is currently unknown.

Rural areas

42. Rural areas face particular challenges on the roll-out of charging infrastructure. People often make longer journeys in rural areas compared with urban areas. Many rural areas also rely on visitors, which makes destination charging critical.[141] Several witnesses told us that the Government should intervene at potential 'not-spots' in rural areas, where

131 Q48 (Peter Molyneux)
132 Qq24–25 (Sarah Owen-Vandersluis), Q50 (Andrew Hickford), Q51 (Lucy Hayward-Speight), RAC Motoring Services (EVP0013), Living Streets (EVP0104), Arup (EVP0105), Transport for the North (EVP0101)
133 Q50 (Andrew Hickford)
134 Q51 (Lucy Hayward-Speight), Q52 (Andrew Hickford)
135 Qq24–26 (Sarah Owen-Vandersluis)
136 Arup (EVP0105), Q25 (Sarah Owen-Vandersluis)
137 Q109 (Rachel Maclean MP)
138 Q122 (Rachel Maclean MP)
139 Letter from Rachel Maclean MP, Parliamentary Under Secretary of State at the Department for Transport, to Huw Merriman MP, 2 July 2021
140 Q124 (Richard Bruce)
141 Qq48, 60 (Peter Molyneux)

there is a weak business case for investment because utilisation is low.[142] Peter Molyneux at Transport for the North highlighted the importance of installing charge points in areas where they are not economically viable to ensure that the roll-out of charging infrastructure benefits everyone.[143] Ed Birkett, Senior Research Fellow at Policy Exchange, suggested that the Government should be prepared to pay more for charge points in rural areas than in other locations where the private sector is delivering.[144] However, substantial analytical work is required to determine which areas are likely to be underserved by charging infrastructure.[145] Sarah Owen-Vandersluis told us that

> You have to do a lot of demand modelling and make assumptions about future charging behaviour to work out which of those sites might not be viable, and over what period of time. It is quite complicated to work out what types of technology should go in—what speed of charger, what type of charger, how many connectors and all of those things.[146]

Ed Birkett told us that some commercial providers are starting to develop metrics, so they can work out which areas are underserved, and suggested that the Government could do the same.[147]

43. It is not clear how the Government will ensure the provision of sufficient charge points in all areas of the country, including rural and remote areas, by 2030. The Minister told us that the electric vehicle charging infrastructure strategy will provide more detail and take account of how people charge and make their journeys. The Minister was confident that the Government is providing sufficient certainty for the charge point market to move into rural areas. She stated that she was "absolutely sure" that in a year's time, rural areas will have "much better" charge point provision.[148] However, the Minister did not provide a clear, quantifiable target against which to measure success.

44. **Drivers who do not have access to off-street parking and who live in rural or remote areas may struggle to charge their vehicles. To ensure that a comprehensive network of electric vehicle charging infrastructure is in place by 2030, sub-national transport bodies and local authorities will need to implement strategies to deliver a range of practical and accessible charging solutions to suit local needs.**

45. ***As part of its electric vehicle charging infrastructure strategy, the Government must explain:***

a) ***how it will support all regions and local authorities to deliver sufficient and well-maintained charging infrastructure solutions tailored to local needs, so that no area is left behind; and***

b) ***how it will ensure that the roll-out of charging infrastructure keeps pace with the increase in EVs and that the right types of chargers are in the right locations.***

142 ChargePoint (EVP0010), RAC Motoring Services (EVP0013), Shell UK (EVP0027), Bright Blue (EVP0032), Energy UK (EVP0053), SMMT (EVP0136), Electromobility (EVP0152), Green Alliance (EVP0125), Policy Exchange (EVP0016)
143 Q60 (Peter Molyneux)
144 Qq21, 23 (Ed Birkett)
145 Q20 (Sarah Owen-Vandersluis), Q59 (Andrew Hickford)
146 Q20 (Sarah Owen-Vandersluis)
147 Q21 (Ed Birkett)
148 Q152 (Rachel Maclean MP)

46. ***To facilitate the roll-out of charging infrastructure, the Government must:***

a) ***use the upcoming Planning Bill to make public charge point provision a requirement of local plans;***

b) ***make funding for the on-street residential charging scheme dependent upon local authorities having detailed charge point plans in place which support rapid charging options; and***

c) ***ring-fence a portion of the £90 million local charging scheme to allow local authorities to employ dedicated 'charge point champions' to deliver local charging infrastructure strategies.***

47. ***The Government must work with National Grid to map the electricity network to assess potential weak areas, especially in rural locations, and to develop a plan to prevent 'not-spots' from emerging similar to those during the roll-out of broadband and mobile coverage.***

Project Rapid

48. The Government has set out a vision for a rapid charging network across England's motorways and A-roads to meet future charging demand from electric vehicles ahead of need.[149] The £950 million rapid charging fund was announced to support private investment at strategic sites where electrical connection is expensive and commercially non-viable.[150] However, the timing and delivery of this funding is yet to be confirmed. Government policy is to have at least six rapid charge points at motorway service areas by 2023, with up to 10 to 12 charge points at larger sites. The long-term plan includes 6,000 rapid chargers on the strategic road network (SRN) by 2035. Graeme Cooper from National Grid, who was involved at the start of Project Rapid, told us that provision on the SRN is important for building public confidence during the transition to ZEVs.[151] That observation was reflected in our survey of drivers (see Annex A) in which a majority said that the Government's funding for rapid chargers on the SRN gives them the most confidence to purchase an electric vehicle.

49. Several witnesses welcomed the announcement of Project Rapid and the accompanying £950 million.[152] However, some raised concerns about how the money will be spent.[153] Witnesses told us that the Government should allocate funding to encourage a competitive market for charge point operators.[154] National Grid told us that it could take on average two and half years to build each electricity network connection, which means that the Government will need to disburse the fund quickly in order to meet its target. The Government should also accommodate the future charging demands of vehicles other

149 Motorways and A roads are known as the strategic road network

150 BEIS, DfT and OZEV, *Government vision for the rapid chargepoint network in England*, 14 May 2020

151 Q33 (Graeme Cooper)

152 ChargePoint (EVP0010), Energy UK (EVP0053), Association of Convenience Stores (EVP0092), Transport for the North (EVP0101), McLaren Automotive (EVP0114), National Grid (EVP0117), SMMT (EVP0136), Q38 (Ed Birkett and Sarah Owen-Vandersluis)

153 Q33 (Graeme Cooper), National Grid (EVP0117), Shell UK (EVP0027)

154 Q12 (Roger Hunter), Shell UK (EVP0027), Mr Ian Roberts (EVP0043)

than cars, such as HGVs, vans, and buses.[155] Roger Hunter, Vice President of Electric Mobility at Shell UK, said "when you dig up the road and put a cable in, think a few steps ahead and then you will not have to re-dig it and put another one down later."[156]

50. Richard Bruce said that Project Rapid will take place over several workstreams, with the first—providing at least six rapid chargers at motorway service areas by 2023—contingent on recently announced Ofgem funding and working with Highways England and the private sector.[157] He confirmed that the rapid charging fund itself is a longer-term investment to meet the future charging demands from 100% electric vehicles by 2040 and 2050.[158] This will be done in several stages, with work starting over the next year or two. However, the Minister told us that the process by which the rapid charging fund will be administered is still being worked out.[159]

Critical infrastructure

51. It is vital that electric vehicle drivers have access to charging infrastructure at all times. Tanya Sinclair, Policy Director UK and Ireland at ChargePoint, informed us that during the first national lockdown, charge points co-located in destinations such as retail car parks were inaccessible because those non-essential locations had to close.[160] She told us that

> Essential workers who were driving electric vehicles were not able to use that fuelling infrastructure. Going forward, we need to think about the proliferation of electric vehicles when they become the majority of cars and vans on the street, and ensure that drivers can trust that the fuelling infrastructure is always accessible to them.[161]

52. ChargePoint argued that charging infrastructure should be regarded as 'critical national infrastructure' and receive the appropriate Government support.[162] Ed Birkett, Senior Research Fellow at Policy Exchange, said that stakeholders should work together to determine what the equivalent of fuel rationing looks like for electric vehicle charging.[163] The Minister said that the Department would examine the effect of the pandemic on charging infrastructure.[164]

53. Although charging infrastructure is quickly becoming part of our critical infrastructure, as long as it remains attractive to private sector investment, it does not necessarily need the public sector to deliver it.[165] However, Simon Statham at Midlands Connect argued that the private sector is delivering infrastructure to support relatively

155 Q6 (Roger Hunter), Q13 (Graeme Cooper), National Grid (EVP0117)
156 Q34 (Roger Hunter)
157 Q139 (Richard Bruce)
158 Ibid
159 Qq138–139 (Rachel Maclean MP, Richard Bruce)
160 Q10 (Tanya Sinclair)
161 Ibid
162 ChargePoint (EVP0010)
163 Q39 (Ed Birkett)
164 Q159 (Rachel Maclean MP)
165 Q39 (Ed Birkett), Oral evidence taken on 12 May 2021, HC (2021–22) 24, Q58 (Nick Smallwood)

well-off people who have already bought, or who are planning to buy, an electric vehicle. He said that the public sector should intervene to put charge points in other locations to incentivise different groups of people to choose electric cars.[166]

54. The Minister confirmed that work undertaken through Project Rapid and the rapid charging fund is already designated as critical national infrastructure.[167] However, some witnesses called for the Government to extend the scope of Project Rapid beyond the SRN to address electricity network distribution bottlenecks, such as across rural areas and at fleet and logistics hubs.[168] The cost and administrative processes of upgrading electricity connections may often deter businesses, including charge point operators, from investing in infrastructure.[169] Many businesses may also be unwilling to take the first step in upgrading local connections due to the 'first mover' principle, whereby the company that pays for the costs of the grid upgrade is disadvantaged compared with competitors that will benefit from the upgrade.[170] Ofgem is consulting on socialising electricity reinforcement costs across all energy bill payers to reduce the costs of connecting charge points to the electricity network.[171]

55. A pilot scheme in Scotland, Project PACE, was successful in installing 180 public chargers at 40 sites across Lanarkshire. The project was a strategic partnership between Transport Scotland, SP Energy Networks, and local authorities. It ensured that distribution network operators (DNOs) were involved in various stages of charge point roll-out, including costs and delivery timescales. SP Energy said that the project, which targeted locations that already made effective use of the electricity network, would deliver up to £60,000 savings on electricity grid connections and increase EV charging capacity by 360%. It argued that scaling up the project to the whole of the UK could see £310 million in savings.[172]

56. Unanswered questions remain on grid upgrades and associated issues, such as addressing the high costs of obtaining wayleaves, which may be mitigated by classifying charge point locations as critical infrastructure.[173] The Government has said that facilitating charge point installation is a private negotiation between the company and landowner. However, the landowner is under no obligation to grant a wayleave. If agreement is not reached between the parties, the electricity licence holder (the electricity company) has powers under the Electricity Act 1989 to apply, on behalf of the company seeking a wayleave, to the Secretary of State for Business, Energy and Industrial Strategy for a compulsory wayleave.[174]

166 Oral evidence taken on 12 May 2021, HC (2021–22) 24, Q101 (Simon Statham)
167 Q159 (Rachel Maclean MP)
168 Q5 (Tanya Sinclair), Q29 (Roger Hunter), Q35 (Graeme Cooper), ChargePoint (EVP0010), Shell UK (EVP0027), SMMT (EVP0136)
169 Arup (EVP0105), Shell UK (EVP0027), ChargePoint (EVP0010), Q28 (Tanya Sinclair)
170 Association of Convenience Stores (EVP0092), CCC (EVP0118), Logistics UK (EVP0083), National Franchised Dealers Association (EVP0081), Petrol Retailers Association (EVP0023)
171 HM Government, *Transitioning to zero emission cars and vans: 2035 delivery plan*, 14 July 2021
172 SP Energy Networks, Investment and Innovation, accessed 20 July 2021, SP Energy Networks, Pioneering electric vehicle project to deliver up to £2.6 million of savings to taxpayers, accessed 20 July 2021
173 Q39 (Sarah Owen-Vandersluis), a wayleave is a right of way granted by landowners to lay cabling for chargers
174 UIN129947 (on Electric Vehicles: Charging Points), 27 February 2017

57. The relationship between landowners and telecommunications operators is regulated by the Electronic Communications Code under the Digital Economy Act 2017. The new code gives rights to telecommunications providers to install and maintain physical equipment in, over and under land. Under the reformed code, rent is calculated based on the current value of the land to the landowner and not the economic value to the operator as a future telecommunications site.[175] When we questioned the Minister on the high expenses associated with wayleaves for installing charging infrastructure, she acknowledged the issue and stated that the Department is working with other Departments to resolve it.[176]

58. **Project Rapid, which specifies the number of charge points on the strategic road network by 2023 and beyond, is welcome. However, the spending priorities for the £950 million rapid charging fund are currently obscure. Given the time and expense involved in upgrading grid connections, it is crucial that this money is distributed to unlock investment, provide fully future-proofed grid capacity and secure public confidence in charging infrastructure.**

59. ***The electric vehicle charging infrastructure strategy must set out:***

a) ***how the £950 million rapid charging fund will be spent to facilitate the implementation of charging infrastructure; and***

b) ***the measures that the Government is taking to identify and address under-provision at locations outside the strategic road network, where grid connection costs and grid upgrades are expensive and the business case for investment is weak.***

60. ***The Government must amend the wayleave regime for installing charging infrastructure to ensure that that regime does not act as a barrier to roll-out.***

61. We questioned the Department on emergency planning for cases in which electric vehicles might be stranded on UK roads, particularly along the strategic road network. We raised the concern that EVs might run out of charge if they were to sit in stationary traffic due to congestion for an extended period while using the battery for heating or cooling. The Minister recognised that the concern was "understandable."[177] She informed us that only 1KW to 3KW of electricity is used by the air conditioning system when a vehicle is moving at slow speeds. The Minister also claimed that running out of fuel, whether conventional or electric charge, accounts for few breakdowns, especially on the strategic road network.[178] We also examined the length of time that it takes to recover electric vehicles. The Minister acknowledged that EVs are difficult to tow with their wheels still on the ground, making the recovery process longer than for ICE vehicles. She said that Highways England and the breakdown sector have taken steps to anticipate the transition to electric vehicles.[179] However, we urge the Government to monitor the situation as the number of EVs increases.

175 Eversheds Sutherland, The New Electronic Communications Code, accessed 15 July 2021
176 Q148 (Rachel Maclean)
177 Letter from Rachel Maclean MP, Parliamentary Under Secretary of State, at the Department for Transport to Huw Merriman MP, dated 6 July 2021
178 Ibid
179 Ibid

Customer experience at public charge points

Interoperability

62. It is important for consumer confidence in charging infrastructure that drivers can access networks with common standards of interoperability when charging their electric vehicles.[180] Full interoperability allows drivers to use any app to access a charge point network, obtain information and make a payment.[181] However, the current lack of interoperability between public charging networks is a significant barrier to the uptake of electric vehicles.[182] For example, many different networks have their own payment systems that require drivers to use different apps and key fobs and to register their bank details with each network.[183]

63. The Government pointed out that charge points installed with public money already have strict eligibility criteria. However, it has acknowledged that more should be done to improve the customer experience at public charge points and stands ready to regulate, using powers under the Automated and Electric Vehicles Act 2018, if needed.[184] A recent Government consultation included proposals to ensure open, accessible and available charge point data, a reliable charging network, streamlined payment methods and clear pricing metrics.[185]

64. Shell UK argued that although interoperability is important for the consumer and could be mandated, it should be based on commercial agreements between operators.[186] Ed Birkett from Policy Exchange cautioned against blanket solutions for interoperability. He told us that heavy-handed regulation could ruin some business cases and slow down the roll-out of charge points.[187] Instead, he argued, the Government should ensure high interoperability standards for charge points that receive public money.[188] The EV Energy Taskforce (EVET) proposed to the Government that if industry has not achieved convergence on a set of standards that meet interoperability by 2025, then the Government must intervene.[189]

65. ChargePoint told us that the Netherlands has implemented full interoperability between all charging networks based on cross-network agreements. However, it observed that progress in the UK is too slow to achieve full interoperability because not all charging market players have been willing to co-operate. As a result, ChargePoint told us that the Government should mandate interoperability.[190]

180 Q11 (Tanya Sinclair), Q19 (Caterina Brandmayr)
181 ChargePoint (EVP0010)
182 Dr Steve Melia (EVP0006), ChargePoint (EVP0010), Policy Exchange (EVP0016)
183 Q18 (Tanya Sinclair), Dr Steve Melia (EVP0006); ChargePoint (EVP0010), London Chamber of Commerce and Industry (EVP0050), Logistics UK (EVP0083), Smart DCC (EVP0090), Licensed Taxi Drivers' Association (EVP0109), Transport for London (EVP0138), Mr Richard Kay (EVP0011)
184 UIN 3189 (on Electric Vehicles: Charging Points), 18 May 2021
185 Department for Transport and OZEV, *The consumer experience at public chargepoints*, 13 February 2021
186 Shell UK (EVP0027), Q19 (Roger Hunter)
187 Q22 (Ed Birkett)
188 Ibid
189 EV Energy Taskforce, *Energising our electric vehicle transition*, January 2020
190 Q14 (Tanya Sinclair), ChargePoint (EVP0010)

66. The Minister confirmed that the Government "absolutely" plans to regulate for interoperability between public charge points later this year.[191] She acknowledged that, although there is an overriding need to legislate, the right balance needs to be struck between making charging easier for the consumer and allowing the market to remain attractive for investment.[192]

Cost of charging in public

67. Several witnesses told us that the Government should find a way to ensure that pricing is fair for people who charge their electric vehicles in public.[193] Ed Birkett from Policy Exchange told us that on-street charging will always be more expensive than off-street because the customer is paying for both the electricity and the capital cost of the charge point being installed.[194] The National Audit Office (NAO) has found that charging at home is between 59% to 78% cheaper than charging in public.[195] Charge point operators told us that consumers who charge their electric vehicles at home only pay 5% VAT, whereas drivers who rely on the public charging network incur 20% VAT.[196] Ed Birkett suggested that the Government and/or local authorities could impose price caps on charge point operators where a charge point operator could claim a local monopoly.[197] Other witnesses called for mechanisms to ensure pricing transparency.[198] There are public charge points across the UK where drivers can charge their vehicles for free. However, availability varies significantly with 60% of chargers located in Scotland free to use. By comparison, 22% of public chargers in the South East and 31% in the North West are free. Most free chargers in Scotland are provided by ChargePlace Scotland, a Government backed national network of charge points, with 1000 of their chargers free to use.[199]

68. The Minister told us that the Government has ruled out introducing price caps to address the higher costs of charging in public compared with charging at home.[200] Instead, the Minister said that the market will play a huge role and that the Government will regulate to ensure pricing transparency at public charge points.[201]

69. **Charging an electric vehicle should be convenient, straightforward, and inexpensive. To boost consumer confidence in the charging network, to maximise convenience and value for motorists and to facilitate connectivity, all charge points should be interoperable and provide a seamless experience for drivers. We welcome the Government's commitment to regulate interoperability and pricing transparency for public charge points later in 2021.**

191 Q154 (Rachel Maclean MP)
192 Q167 (Rachel Maclean MP)
193 RAC Motoring Services (EVP0013), Honda Motor Europe (EVP0014), Policy Exchange (EVP0016), y JouleVert Limited (EVP0025), Association of Directors of Environment, Economy, Planning and Transport (EVP0036), Groupe Renault (EVP0041), Mr Ian Roberts (EVP0043), RAC Foundation (EVP0045), Smart DCC (EVP0090), Arup (EVP0105), Licensed Taxi Drivers' Association (EVP0109), GMB Trade Union (EVP0116), LV General Insurance (EVP0114), Siemens Mobility Limited (EVP0098), Shell UK (EVP0027)
194 Q22 (Ed Birkett)
195 National Audit Office, *Reducing carbon emissions from cars*, 19 February 2021
196 Q22 (Tanya Sinclair), Q24 (Roger Hunter)
197 Q22 (Ed Birkett)
198 Mr Richard Kay (EVP0011), Arup (EVP0105), LV General Insurance (EVP0144)
199 Zap Map, Free EV charging points: where are they all?, accessed 20 July 2021
200 Q156 (Rachel Maclean MP)
201 Q155 (Rachel Maclean MP)

70. ***In the charging infrastructure strategy, the Government must explain how it will improve the consumer experience at public charge points and ensure that***

a) ***drivers can seamlessly access any charging network in any location at any time; and***

b) ***charge point operators are not disincentivised from investing in charging infrastructure.***

71. **People who rely on public charging infrastructure should get value for money and should not be disadvantaged by unfair pricing mechanisms.**

72. ***The Government must explain how it plans to tackle the potential price differential faced by people who cannot charge their vehicles at home and are compelled to rely on on-street public charge points. It could do this by:***

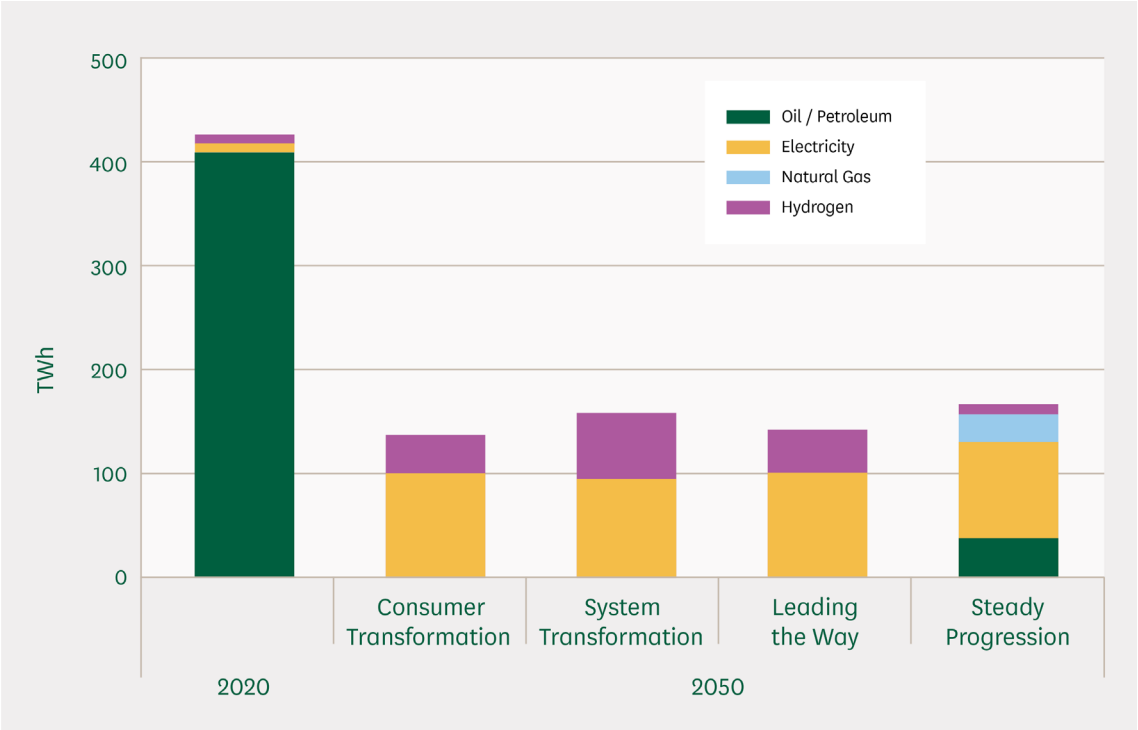
a) ***protecting the consumer from excessive costs where there are risks of local monopolies emerging; and***

b) ***addressing the discrepancy between the 5% VAT incurred on electricity at home compared with the 20% VAT incurred at public charge points.***

4 Managing energy demand and smart charging

73. The National Grid's 2021 Future Energy Scenarios (FES), which outlines four different pathways for energy usage over the next 30 years, forecasts an overall reduction in energy demand across all scenarios as road transport is decarbonised.[202] However, each scenario also demonstrates that the transition to electric vehicles will result in increased demands on the electricity system (see Figure 3).[203]

Figure 3: Total annual demand for road transport in 2050



Source: National Grid, Future Energy Scenarios 2021

74. The Department stated that it regularly meets electricity network operators to discuss how extra demand can be met.[204] In July 2019, the Government launched a consultation on its aim to "maximise the use of smart charging technologies, to benefit both consumers and the electricity system, while supporting the transition to EVs."[205] To achieve its aim, the Government stated that it will intervene to encourage consumer uptake of smart charging and innovation.[206] Phase one of the consultation focused on the potential merits of mandating that all private charge points are smart and meet minimum device standards.[207]

202 The four scenarios are; Steady Progression, System Transformation, Consumer Transformation, and Leading the Way.
203 National Grid, *Future Energy Scenarios*, July 2021, p.58
204 UIN 130716 (on Electric Vehicles: Charging Points), 16 December 2020
205 HM Government, *Electric Vehicle Smart Charging*, July 2019, The Government has defined smart charging as shifting the time of day when an EV charges, or modulating the rate of charge at different times, in response to signals (e.g. electricity tariff information).
206 Ibid
207 Ibid

The relevant legislation will be laid before Parliament in 2021.[208] The Government and Ofgem will publish the second phase of the Smart Systems Flexibility Plan (SSFP) in 2021, which will set out the reforms necessary to ensure flexibility across the energy system.[209]

75. Several witnesses raised the extra demand that electric vehicle charging will place on the grid as the uptake of ZEVs increases.[210] However, Energy UK and National Grid told us that the electricity network, at both transmission and distribution levels, can cope with increases in demand and that smart charging will play a crucial role.[211] Graeme Cooper from National Grid explained that Ofgem has already indicated that energy will be measured every half-hour, which will stimulate smart-tariffs. With a smart charger, drivers can charge their vehicles "smartly when the grid is at least pressure and is the cleanest, greenest and cheapest."[212]

76. Winning the trust and confidence of consumers in all aspects of the transition to ZEVs is essential, including the roll-out of smart charging.[213] If people do not apply for the Government's home charging grant, then they can easily buy and install a low standard charger without smart functionality.[214] There are also "thousands of chargers in the field" that predate smart functionality.[215] Graeme Cooper told us that the Government should mandate all chargers to be "smart, visible and controllable," while leaving it to the market to decide who should control smart functionality for the consumer.[216] Shell UK called for a consumer-led approach to the roll-out of smart charging.[217] A small-scale trial demonstrated that managed smart charging resulted in operational benefits for the grid.[218] The EV Energy Taskforce recommended that an independent, consumer-facing body should undertake an ongoing and proactive campaign to communicate the benefits of smart charging to the public.[219]

77. The Department is confident that the energy market will respond to the increase in electricity demand as a result of the transition to electric vehicles. Richard Bruce suggested that off-peak tariffs will incentivise people, including those who currently have chargers without smart functionality, to charge their vehicles overnight.[220] The Minister confirmed that the Government is using powers in the Automated and Electric Vehicles Act 2018 to make all newly installed private charge points include smart functionality. For on-street charging, charge point operators have a "massive commercial incentive" to aggregate energy from vehicles plugged into on-street chargers and sell it back to the grid.[221] The

208 UIN 130716 (on Electric Vehicles: Charging Points), 16 December 2020
209 HM Government, *Transitioning to zero emission cars and vans: 2035 delivery plan*, 14 July 2021
210 RAC Motoring Services (EVP0013), Honda Motor Europe (EVP0014), Mr Michael Cope (EVP0022), Association of Directors of Environment, Economy, Planning and Transport (EVP0036), Alliance of British Drivers (EVP0037), England's Economic Heartland (EVP0039), North East England Chamber of Commerce (EVP0049), Transport for West Midlands (EVP0078), Logistics UK (EVP0083), Ombudsman Services (EVP0086), Siemens Mobility Limited (EVP0098), Transport for the North (EVP0101), Arup (EVP0105), TRL Ltd (EVP0110), CCC (EVP0118), SMMT (EVP0136)
211 Energy UK (EVP0053), National Grid (EVP0117)
212 Q39 (Graeme Cooper)
213 EV Energy Taskforce, *Energising out electric vehicle transition*, January 2020
214 Q15 (Graeme Cooper), Q16 (Tanya Sinclair)
215 Q16 (Tanya Sinclair)
216 Q15 (Graeme Cooper)
217 Shell UK (EVP0027)
218 Q17 (Roger Hunter)
219 EV Energy Taskforce, *Energising out electric vehicle transition*, January 2020
220 Q144 (Richard Bruce)
221 Q145 (Richard Bruce)

Department is confident that as smart charging technology becomes more sophisticated, new ways for electric vehicles to interact with the grid will emerge, such as vehicle-to-grid (V2G) technology.[222]

78. **We welcome the Government's commitment to mandate that all new private charge points should be equipped with smart functionality and to introduce the relevant legislation later in 2021.**

79. ***The Government must mandate industry to:***

a) ***use price as a lever to shift consumer behaviour away from conventional refuelling habits towards 'a little but often' approach; and***

b) ***incentivise consumers to charge at times when there is less demand on the electricity grid.***

222 Q144 (Richard Bruce)

Annex A: Survey results

We launched a survey via social media on 19 May 2021 in which we asked drivers about purchasing electric vehicles. We received a total of 979 responses. The survey was open for two weeks and closed on 2 June 2021. The results are:

Have you heard of the Government's plug-in car, van, and truck grant to help buyers of new electric vehicles?

n = 979

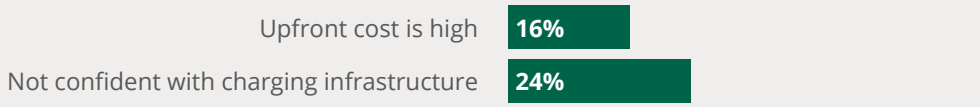
Would this grant persuade you to purchase a new electric vehicle?

n = 640

Would you consider buying a second-hand or used electric vehicle?

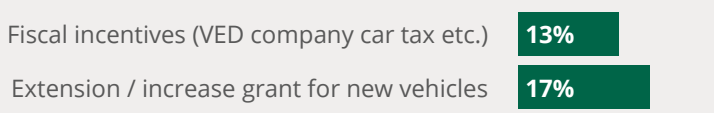
n = 979

If not, from the following, what would put you off buying a second-hand or used electric vehicle?



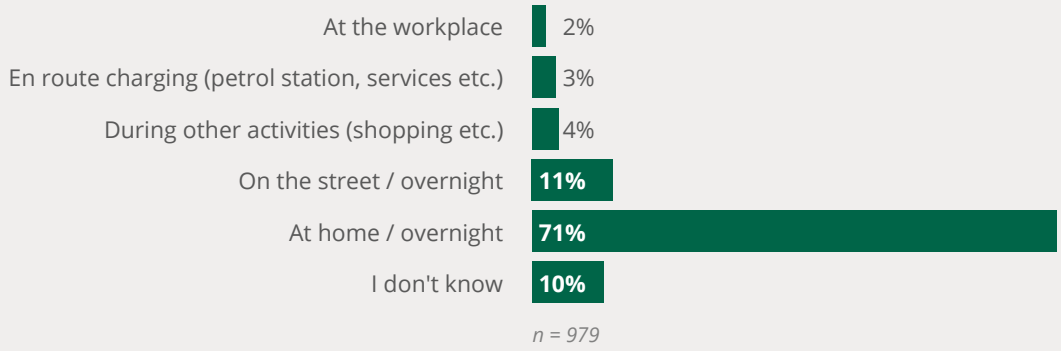
n = 431

Choosing one from the following, what other incentives would persuade you to buy electric?



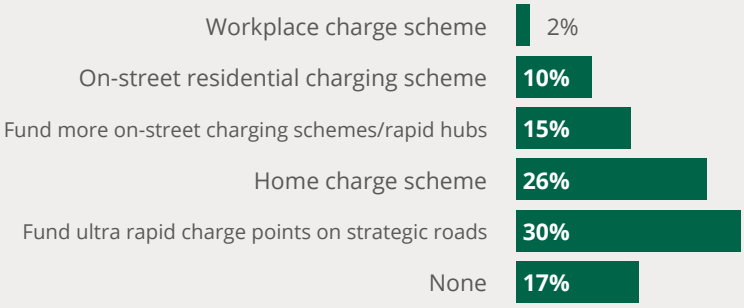
n = 979

Where and when would you expect to charge your electric vehicle the most?



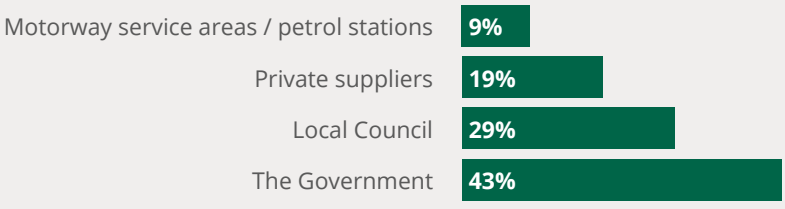
n = 979

Which one of these current Government schemes or plans around charging would give you the most confidence to go ahead and buy an electric vehicle?



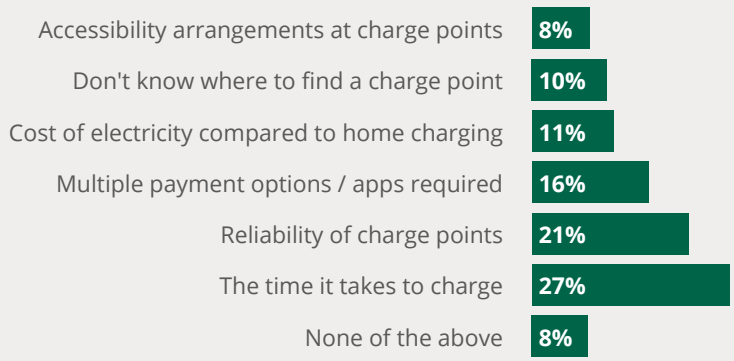
n = 979

Who should be responsible for providing or adminstering public charge points?



n = 979

From the following, what is your main concern with public charge points?



n = 979

Conclusions and recommendations

Uptake of zero emission vehicles

1. A healthy used electric vehicle market is critical to ensuring that electric vehicles are not the sole preserve of people who can afford new models. The Government's position is that current incentives to stimulate the sale of new EVs are sufficient to support the development of the second-hand EV market. However, electric vehicles that will be traded on the second-hand market in three to five years' time are likely to be more expensive to buy upfront than comparable ICE models. To drive mass consumer uptake of ZEVs, the Government must ensure that the market facilitates the supply of affordable new and used electric vehicles. (Paragraph 17)

2. In order to ensure that the Government achieves the targets set out in the Transport Decarbonisation Plan, it may need to intervene to support the second-hand market in electric vehicles until price parity with comparable ICE vehicles is reached. (Paragraph 18)

3. A zero emission vehicle mandate would:

    - be revenue neutral;
    - provide certainty to allow manufacturers to invest in the UK and supply a sufficient volume of ZEVs to meet the UK's decarbonisation commitments;
    - reduce costs for consumers by increasing the supply of electric vehicles; and
    - free taxpayers from the annual £135 million cost of the plug-in car grant. (Paragraph 26)

4. *In order to achieve its 2030 and 2035 targets, the Government must introduce a ZEV mandate to incentivise manufacturers to sell an increasing proportion of ZEVs or to purchase tradeable credits year-on-year, reaching some 100% ZEV sales by 2030.* (Paragraph 27)

5. *The Government must define 'significant zero emissions capability' for the automotive manufacturing industry, while ensuring that only the cleanest possible hybrid technology is available until 2035. It should also maintain a technology-neutral approach to the transition to ZEVs and explore the potential of alternative fuels, such as hydrogen or other alternatives to petrol and diesel, where possible.* (Paragraph 32)

Charging infrastructure

6. Drivers who do not have access to off-street parking and who live in rural or remote areas may struggle to charge their vehicles. To ensure that a comprehensive network of electric vehicle charging infrastructure is in place by 2030, sub-national transport bodies and local authorities will need to implement strategies to deliver a range of practical and accessible charging solutions to suit local needs. (Paragraph 44)

7. *As part of its electric vehicle charging infrastructure strategy, the Government must explain:*

    a) *how it will support all regions and local authorities to deliver sufficient and well-maintained charging infrastructure solutions tailored to local needs, so that no area is left behind; and*

    b) *how it will ensure that the roll-out of charging infrastructure keeps pace with the increase in EVs and that the right types of chargers are in the right locations.* (Paragraph 45)

8. *To facilitate the roll-out of charging infrastructure, the Government must:*

    a) *use the upcoming Planning Bill to make public charge point provision a requirement of local plans;*

    b) *make funding for the on-street residential charging scheme dependent upon local authorities having detailed charge point plans in place which support rapid charging options; and*

    c) *ring-fence a portion of the £90 million local charging scheme to allow local authorities to employ dedicated 'charge point champions' to deliver local charging infrastructure strategies.* (Paragraph 46)

9. *The Government must work with National Grid to map the electricity network to assess potential weak areas, especially in rural locations, and to develop a plan to prevent 'not-spots' from emerging similar to those during the roll-out of broadband and mobile coverage.* (Paragraph 47)

10. Project Rapid, which specifies the number of charge points on the strategic road network by 2023 and beyond, is welcome. However, the spending priorities for the £950 million rapid charging fund are currently obscure. Given the time and expense involved in upgrading grid connections, it is crucial that this money is distributed to unlock investment, provide fully future-proofed grid capacity and secure public confidence in charging infrastructure. (Paragraph 58)

11. *The electric vehicle charging infrastructure strategy must set out:*

    a) *how the £950 million rapid charging fund will be spent to facilitate the implementation of charging infrastructure; and*

    b) *the measures that the Government is taking to identify and address under-provision at locations outside the strategic road network, where grid connection costs and grid upgrades are expensive and the business case for investment is weak.* (Paragraph 59)

12. *The Government must amend the wayleave regime for installing charging infrastructure to ensure that that regime does not act as a barrier to roll-out.* (Paragraph 60)

13. Charging an electric vehicle should be convenient, straightforward, and inexpensive. To boost consumer confidence in the charging network, to maximise convenience and value for motorists and to facilitate connectivity, all charge points should

be interoperable and provide a seamless experience for drivers. We welcome the Government's commitment to regulate interoperability and pricing transparency for public charge points later in 2021. (Paragraph 69)

14. *In the charging infrastructure strategy, the Government must explain how it will improve the consumer experience at public charge points and ensure that*

    a) drivers can seamlessly access any charging network in any location at any time; and

    b) charge point operators are not disincentivised from investing in charging infrastructure. (Paragraph 70)

15. People who rely on public charging infrastructure should get value for money and should not be disadvantaged by unfair pricing mechanisms. (Paragraph 71)

16. *The Government must explain how it plans to tackle the potential price differential faced by people who cannot charge their vehicles at home and are compelled to rely on on-street public charge points. It could do this by:*

    a) protecting the consumer from excessive costs where there are risks of local monopolies emerging; and

    b) addressing the discrepancy between the 5% VAT incurred on electricity at home compared with the 20% VAT incurred at public charge points. (Paragraph 72)

Managing energy demand and smart charging

17. We welcome the Government's commitment to mandate that all new private charge points should be equipped with smart functionality and to introduce the relevant legislation later in 2021. (Paragraph 78)

18. *The Government must mandate industry to*:

    a) use price as a lever to shift consumer behaviour away from conventional refuelling habits towards 'a little but often' approach; and

    b) incentivise consumers to charge at times when there is less demand on the electricity grid. (Paragraph 79)

Formal minutes

Tuesday 21 July 2021

Members present:

Huw Merriman, in the Chair

Mr Ben Bradshaw	Karl McCartney
Ruth Cadbury	Grahame Morris
Simon Jupp	Gavin Newlands
Chris Loder	Greg Smith

Draft Report (*Zero emission vehicles*), proposed by the Chair, brought up and read.

Ordered, That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 79 read and agreed to.

Annex and Summary agreed to.

Resolved, That the Report be the First Report of the Committee to the House.

Ordered, That the Chair make the Report to the House.

Ordered, That embargoed copies of the Report be made available, in accordance with the provisions of Standing Order No. 134.

[Adjourned till tomorrow at 9.30 am

Witnesses

The following witnesses gave evidence. Transcripts can be viewed on the inquiry publications page of the Committee's website.

Wednesday 28 April 2021

Ed Birkett, Senior Research Fellow in Energy and Environment Policy, Policy Exchange; **Caterina Brandmayr**, Head of Climate Policy, Green Alliance; **Sarah Owen-Vandersluis**, Head of Public Sector Mobility and Trade Lead Partner, KPMG Q1–42

Mr Eamonn Ives, Head of Energy and Environment Policy, Centre for Policy Studies; **Edward Leigh**, Chair, Smarter Cambridge Transport; **Ms Claire Haigh**, Founder and Chief Executive Officer, Greener Transport Solutions; **Professor Philip Booth**, Director, Vinson Centre, University of Buckingham, Senior Academic Fellow, Institute of Economic Affairs Q43–86

Wednesday 9 June 2021

Tanya Sinclair, Policy Director UK & Ireland, Chargepoint; **Roger Hunter**, Vice President Electric Mobility, Shell UK; **Graeme Cooper**, Head of Future Markets, National Grid Q1–41

Mr Peter Molyneux, Major Roads Director, Transport for the North; **Lucy Hayward-Speight**, Transport Strategy & Planning Manager – Air Quality & Environment, Transport for London; **Andrew Hickford**, Project Manager, Leeds City Council Q42–70

Wednesday 23 June 2021

Rachel Maclean MP, Parliamentary Under-Secretary of State, Department for Transport; **Richard Bruce**, Director of Environment and Future Mobility, Department for Transport Q71–167

Published written evidence

The following written evidence was received and can be viewed on the inquiry publications page of the Committee's website.

EVP numbers are generated by the evidence processing system and so may not be complete.

1 AAT (Association of Accounting Technicians) (EVP0009)

2 Adam Smith Institute (EVP0107)

3 Alexander Dennis Limited (EVP0137)

4 Alliance of British Drivers (ABD) (EVP0037)

5 Anable, Professor Jillian (Professor of Transport and Energy, Institute for Transport Studies, University of Leeds) (EVP0113)

6 Anglo American (EVP0082)

7 AppyWay (EVP0054)

8 Arup (EVP0105)

9 Association of Convenience Stores (EVP0092)

10 BAE Systems Power and Propulsion Solutions (EVP0028)

11 Ballard Power Systems Europe A/S (EVP0042)

12 Bath and North East Somerset Council (EVP0079)

13 Beyond Logic Consulting (EVP0040)

14 Bright Blue (EVP0032)

15 British Vehicle Rental and Leasing Association (EVP0052)

16 Bulloch, Mr Joseph (Medical Engineer, NHS) (EVP0024)

17 By Miles (EVP0073)

18 CEMEX UK (EVP0089)

19 CGI IT UK Ltd (EVP0123)

20 CPT UK (EVP0018)

21 Campaign for Better Transport (EVP0077)

22 Centre for Policy Studies (EVP0067)

23 Centre for Sustainable Road Freight (EVP0091)

24 Chargepoint (EVP0010)

25 Chartered Institution of Highways and Transportation (EVP0064)

26 Chisholm, Mr Jim (EVP0100)

27 Climate Change Committee (EVP0118)

28 Cope, Mr Michael (ex-Electrical Power Distribution Engineer, Western Power Distribution) (EVP0022)

29 Cox, Kate (EVP0029)

30 Cycling UK (EVP0121)

31 Department for Transport (EVP0120)

32 Doel, Alex (Manager, Public Policy, Uber) (EVP0140)

33 Electric Vehicle Association England (EVP0135)

34 Electrical Safety First (EVP0075)

35 Electromobility UK (EVP0152)

36 Energy UK (EVP0053)

37 Enertechnos (EVP0103)

38 England's Economic Heartland (EVP0039)

39 Federation of Small Businesses (EVP0034)

40 Finance & Leasing Association (EVP0069)

41 Fowler, Richard (EVP0147)

42 GMB Union London Region (EVP0116)

43 Geotab (EVP0139)

44 Go-Ahead Group (EVP0108)

45 Goodwin, Professor Phil (Emeritus Professor, UCL and UWE, & Senior Fellow, Foundation for Integrated Transport); Professor Jillian Anable (Professor of Transport and Energy, ITS, University of Leeds); Professor Glenn Lyons (Mott MacDonald Professor of Future Mobility, CTS, University of the West of England); Professor Greg Marsden (Professor of Transport Governance, ITS, University of Leeds); and Professor Graham Parkhurst (Professor of Sustainable Mobility, CTS, University of the West of England) (EVP0085)

46 Green Alliance (EVP0151)

47 Green Alliance (EVP0125)

48 Greener Transport Solutions (EVP0149)

49 Greener Transport Solutions (EVP0094)

50 Groupe Renault (EVP0041)

51 Haggie, Mr David (MD, GradeMaker Ltd) (EVP0057)

52 heycar and HonestJohn.co.uk (EVP0038)

53 Heydon, Mr Robin (EVP0048)

54 Honda Motor Europe (EVP0014)

55 IMS (part of Trak Global Group) (EVP0060)

56 IPPR (Institute for Public Policy Research) (EVP0065)

57 ITM Power (EVP0035)

58 ITS United Kingdom (EVP0119)

59 Independent Transport Commission (EVP0058)

60 Infrastructure Partnerships Australia (EVP0031)

61 Institute of Economic Affairs (EVP0051)

62 Institution of Civil Engineers (EVP0102)

63 Jacobs (EVP0030)

64 JouleVert Limited (EVP0025)

65 Kay, Mr Richard (Senior Lecturer (retired), Birmingham City University) (EVP0011)

66 LV= General Insurance (EVP0144)

67 Lane, Mr Chris (External communications manager, Essex Highways) (EVP0007)

68 Leeds City Council (EVP0141)

69 Leigh, Edward (Leader, Smarter Cambridge Transport) (EVP0150)

70 Leigh, Edward (Leader, Smarter Cambridge Transport) (EVP0126)

71 Licensed Taxi Drivers Association (LTDA) (EVP0109)

72 Light Rail (UK) (EVP0097)

73 Light Rail Transit Association (EVP0072)

74 Living Streets (EVP0104)

75 Logistics UK (EVP0083)

76 London Chamber of Commerce and Industry (EVP0050)

77 London Forum of Amenity & Civic Societies (EVP0019)

78 London Forum of Amenity & Civic Societies (EVP0026)

79 MCIA (EVP0033)

80 McCann, Dominic (EVP0003)

81 McLaren Automotive (EVP0114)

82 Melia, Dr Steve (Senior Lecturer in Transport and Planning, University of the West of England) (EVP0006)

83 Metz, Dr David (honorary professor, UCL Centre for Transport Studies) (EVP0008)

84 Midland Expressway Limited (EVP0071)

85 Midlands Connect (EVP0066)

86 Mineral Products Association (EVP0146)

87 National Franchised Dealers Association (EVP0081)

88 National grid (EVP0117)

89 Neomatrix Ltd (EVP0002)

90 Newcastle University (EVP0115)

91 Nightingale, Jeremy (FE Lecturer, Weston College:- Offender Learning @ HMPPS Channings Wood) (EVP0004)

92 North East England Chamber of Commerce (EVP0049)

93 Ombudsman Services (EVP0086)

94 Onward (EVP0133)

95 Petrol Retailers Association (EVP0023)

96 Parliamentary Advisory Council for Transport Safety (PACTS) (EVP0087)

97 Policy Exchange (EVP0016)

98 Protium Green Solutions (EVP0145)

99 Pupils 2 Parliament (EVP0059)

100 RAC Foundation (EVP0045)

101 RAC Motoring Services (EVP0013)

102 Renewable Transport Fuel Association (EVP0106)

103 Riversimple Movement Ltd (EVP0132)

104 Road Haulage Association (EVP0084)

105 Robert Bosch Ltd (EVP0017)

106 Roberts, Mr Ian (EVP0043)

107 Shell UK (EVP0027)

108 Siemens Mobility Limited (EVP0098)

109 Smart DCC (EVP0090)

110 Snap Travel Technology (EVP0020)

111 Society of Motor Manufacturers and Traders (SMMT) (EVP0136)

112 Sustrans (EVP0063)

113 TFL (EVP0138)

114 TRL Ltd. (EVP0110)

115 The Association of Directors of Environment, Economy, Planning and Transport (ADEPT); and Hertfordshire County Council (EVP0036)

116 The Chartered Institute of Logistics and Transport (EVP0096)

117 The FairFuelUK Campaign (EVP0070)

118 The Transport Planning Society (EVP0074)

119 Transform Scotland (EVP0076)

120 Transport & Environment UK (EVP0046)

121 Transport Action Network (EVP0134)

122 Transport Associates Network (EVP0129)

123 Transport Focus (EVP0148)

124 Transport for Quality of Life (EVP0080)

125 Transport for West Midlands (TfWM) (EVP0078)

126 Transport for the North (EVP0101)

127 Transport for the South East (EVP0099)

128 UK H2Mobility; and Element Energy (EVP0124)

129 University of Sheffield (EVP0112)

130 Vivacity Labs (EVP0088)

131 Whitmore, Mr David (Retired electrical, electronic, telecommunications engineer, Post Office Engineering Department, British Telecom (retiree)) (EVP0127)

132 Woodford Owen Consulting Limited (EVP0056)

133 Wrightbus and Ryse Hydrogen (EVP0128)

List of Reports from the Committee during the current Parliament

All publications from the Committee are available on the publications page of the Committee's website.

Session 2019–21

Number	Title	Reference
1st	Appointment of the Chair of the Civil Aviation Authority	HC 354
2nd	The impact of the coronavirus pandemic on the aviation sector	HC 268
3rd	E-scooters: pavement nuisance or transport innovation?	HC 255
4th	Road safety: young and novice drivers	HC 169
5th	The impact of the coronavirus pandemic on the aviation sector: Interim report	HC 1257
6th	Trains fit for the future?	HC 876
7th	Safe return of international travel?	HC 1341
8th	The roll-out and safety of smart motorways	HC 26
1st Special	The impact of the coronavirus pandemic on the aviation sector: Interim report: Government Response to the Committee's Fifth Report of Session 2019–21	HC 28
2nd Special	Road safety: young and novice drivers: Government Response to Committee's Fourth Report of Session 2019–21	HC 29
3rd Special	Trains Fit for the Future? Government Response to the Committee's Sixth Report of Session 2019–21	HC 249
4th Special	Safe return of international travel? Government Response to the Committee's Seventh Report of Session 2019–21	HC 489