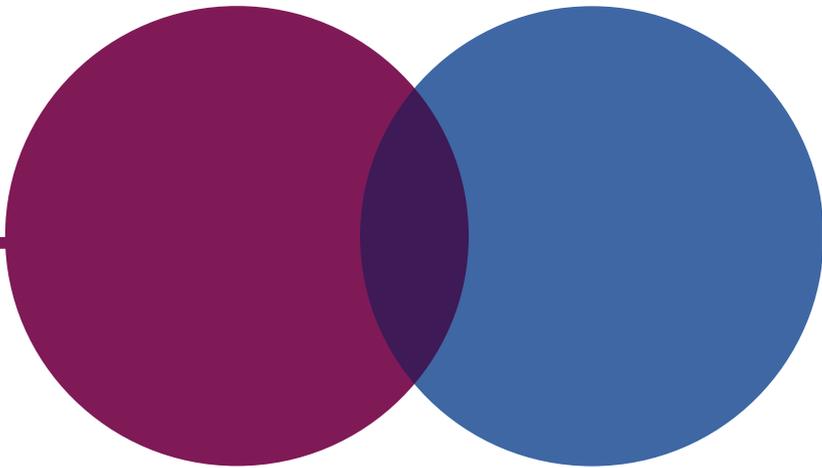




National Audit Office



Reducing carbon emissions from cars

Department for Transport, Department for Business,
Energy & Industrial Strategy

REPORT

**by the Comptroller
and Auditor General**

**SESSION 2019–2021
26 FEBRUARY 2021
HC 1204**

Key facts

2030

date by which sales of new petrol and diesel cars in the UK will end

£1.1bn

amount spent on subsidies for ultra-low emission cars and infrastructure between 2010-11 and 2019-20 to encourage people to use alternatives to petrol and diesel

8%

proportion of new cars sold in the first nine months of 2020 that were ultra-low emission

67.9 million tonnes of CO₂ equivalent emitted by cars in 2018, accounting for 19% of all of the UK's emissions

32.9 million number of cars registered in the UK as at September 2020

348,506 number of ultra-low emission cars registered in the UK as at September 2020; 154,691 of these were fully electric

0.5% proportion of the UK car fleet that is fully electric as at September 2020

142,604 number of electric vehicle charge-points installed with the help of government funding by March 2020 (133,336 are home charge-points)

Summary

Background

1 Transport is the UK's largest source of carbon emissions, with the bulk of these emissions coming from cars. In 2018, building on previous strategies, the Department for Transport (DfT) published an updated strategy, *The Road to Zero*, which set out the government's ambitions for cleaner road transport. The strategy aims to reduce carbon emissions from cars by promoting the use of ultra-low or zero-emission cars and creating the infrastructure that will allow people to charge or fuel their zero-emission cars.¹ The strategy sits within government's wider commitment for the UK achieving "net zero" greenhouse gas emissions by 2050.

2 The Department for Business, Energy & Industrial Strategy (BEIS) has overall responsibility across government for achieving net zero and DfT leads on the strategy to reduce carbon emissions from cars and make roads less congested and polluted by promoting lower-carbon-emitting transport. The Office for Zero Emission Vehicles (OZEV) is a team working across government to support the transition to zero-emission vehicles.² OZEV ultimately reports to the Secretary of State for Transport.

3 The government is trying to increase the sale of ultra-low emission vehicles (ULEV) as a way of reducing carbon emissions. These vehicles are partly or fully powered by battery, or less commonly, powered by hydrogen. In November 2020, government announced its ambition to stop the sale of new cars that are powered solely by petrol or diesel by 2030. From 2035, only zero-emission cars can be sold. Government would like almost all cars on the road to emit zero carbon by 2050. As of September 2020, there were 32.9 million cars registered in the UK, of which 1.1% were ultra-low emission (0.5% were fully electric).

4 The aim to reduce carbon emissions from cars is not new and previous governments have been promoting ultra-low emission cars since 2011. To succeed they need consumers to be convinced these cars are a credible alternative to petrol and diesel particularly in terms of price and ease of charging. This requires the motor industry to supply cars people want to buy, at a price people want to pay, with a good range of models that meet different market needs and with adequate delivery timescales. There also needs to be adequate access to charge-points. This transition therefore requires many factors to come together to provide consumers with the confidence and ability to buy ultra-low emission cars.

¹ Ultra-low emission vehicle (ULEV) is the term used to describe any vehicle that uses low-carbon technologies and emits less than 75g of CO₂ per kilometre travelled in fumes from the tail-pipe. Zero-emission, a subsection of ULEVs, refers to 100% battery powered or powered by hydrogen.

² Previously known as Office for Low Emission Vehicles (OLEV).

5 The government has identified factors that might hinder the development of the market, including uncertainty that might hold back investment by manufacturers or charge-point providers and a lack of economies of scale associated with low initial sales volumes leading to higher prices for consumers. Government financial support has come, for example, in the form of grants to help consumers with the higher purchase cost of buying electric cars, and subsidies to fund the installation of charge-points. Its initiatives have focused on battery electric cars rather than hydrogen as this has been the most market-ready zero-emission technology.

6 OZEV manages the grant schemes and subsidies. By March 2020 it had spent £1.1 billion, including:

- £1 billion on the plug-in car grant, the largest amount spent by OZEV, aimed at reducing the upfront purchase costs of qualifying cars – encouraging higher volumes to be sold, which in turn would create economies of scale and lead to lower prices from manufacturers. The grant is currently £3,000 for qualifying cars and is paid to the car manufacturer;
- £97.2 million on grants to help people install charge-points at home. This grant is paid to the installer and covers 75% of the cost (capped at £350);
- £5.8 million to help local authorities install on-street residential charge-points;
- £3.7 million to help install charge-points at workplaces, capped at £350 per socket; and
- £9.5 million on a consumer awareness campaign.

Highways England has distributed £4.8 million to ensure that 95% of the strategic road network was within 20 miles of a charge-point. HM Treasury has also announced a Charging Infrastructure Investment Fund, a £400 million fund, of which government will invest up to £200 million. A portion of the first £70 million, of which £35 million was government-funded, was invested in September 2019. In addition to direct financial support, the government provides reduced Vehicle Excise Duty and Company Car Tax (an element of income tax for individuals who receive a company car) for lower-carbon-emitting cars.

7 The government's recent announcement to stop the sale of new petrol and diesel cars by 2030 will require a rapid growth in the number of zero-emission cars over the next decade. This report examines how well the government has used public money to support the uptake of ultra-low emission cars and draw lessons for the future. It examines:

- progress in increasing the take-up of ultra-low emission cars through the plug-in car grant;
- the development of charging infrastructure using government financial support; and
- the impact of increasing the sale of ultra-low emission cars on carbon emissions from the UK car fleet so far.

8 The report does not examine other factors that will have an important influence over market expansion, including the action taken by the industry to develop a range of cars with the capabilities consumers want to buy, the impact of regulation on incentivising market behaviours and the role of the power supply market. We focus primarily on the impact on carbon emissions given government's focus on reducing carbon emissions from the tail-pipe, rather than the carbon used in production.

Key findings

Progress encouraging the take-up of ultra-low emission cars

9 **By the end of September 2020, sales of new ultra-low emission cars were above projections made by OZEV in 2013.** In 2013, OZEV projected that between 3% and 7% of all new car sales would be ultra-low emission by 2020. These figures were projections of the potential market and were not intended to be government targets. By the end of September 2020, sales of new ultra-low emission cars in 2020 had accounted for 8% of the market, although this was in a market distorted by the impact of the COVID-19 pandemic with overall new car sales down by 33%. The number of first-time registered ultra-low emission cars rose from over 48,000 between January and September 2019 to over 106,000 between January and September 2020. By the end of September 2020 there were 348,506 ultra-low emission cars licensed in the UK. Approximately half of the ultra-low emission cars are registered to companies and where users have company cars, they benefit from Company Car Tax reductions (paragraphs 1.12, 2.2 to 2.4, and Figure 7b).

10 **While OZEV has assessed the likely impact on the market of changes to the plug-in car grant, it cannot clearly demonstrate the cumulative impact spending £1 billion has had on growth of ultra-low emission cars.** When it introduced the plug-in car grant in 2011, OZEV was not clear what yearly increase it was expecting on sales, above and beyond what might have happened anyway, due to uncertainties in the market. OZEV and DfT undertake regular analysis on the importance of the plug-in car grant to consumers and the potential impact of making changes to the grant. They have not, however, demonstrated the additional impact the grant has achieved over its lifetime (paragraphs 1.11, 2.6 and 2.8, and Figure 6).

11 Government-commissioned consumer surveys have identified an increased willingness to purchase ultra-low emission cars but continue to highlight the upfront purchase costs as a barrier. By stimulating the volume of sales, OZEV's intention had been to encourage economies of scale, thereby reducing manufacturing costs and purchase prices. Even with the plug-in car grant, zero-emission cars remain an average of £13,000 more expensive to purchase than conventional cars. The initial costs of zero-emission cars did not reduce in relative terms to petrol- and diesel-powered cars between 2011 and 2020. The main reason for this is that manufacturers have focused on extending the battery range – the costliest element of an electric car. OZEV recently estimated that in some cases the lifetime cost of owning a zero-emission car had dropped below the petrol and diesel equivalents (paragraphs 2.5, 2.6 and 2.11).

Supporting the development of the charging infrastructure

12 There has been a considerable growth in public charging infrastructure over the past decade. Working with the private sector and local government, the government has supported the development of the charging infrastructure since 2011. OZEV did not quantify what it intended to achieve with the public money spent on the overall charging infrastructure. This makes it difficult to determine whether the value derived from the investment of public money has been in line with its initial expectations. By the end of March 2020, government funding had contributed towards the installation of 133,336 home charging points; 8,578 workplace charging points; and 690 on-street charging points. By October 2020, including infrastructure funded by the private sector, there was a total of 19,487 publicly accessible charge-points in the UK, an increase from fewer than 1,000 in 2011 (paragraphs 1.10, 2.14 and 2.15, and Figure 11).

13 OZEV has not yet focused sufficiently on charge-point availability to ensure adequate provision where people do not have a driveway. OZEV informed us that its early efforts focused on supporting people with off-street parking or with an ability to charge at work, as it deemed them to be more likely to buy electric cars. By March 2020 OZEV had spent £97.2 million on the home-charging grant to support the installation of more than 133,000 off-street chargers. Electric car owners without home chargers need to charge their cars on the street near their home, at work or in public spaces. This can be a particular issue for the 33% of households without access to off-street parking. Between 2017-18 and 2019-20, OZEV has allocated a total of £8.5 million to help local authorities support installation of on-street residential charge points. The uptake of the latter has been slow with underspending in each of the three years (32% of the budget unused). OZEV undertook targeted consultation with local authorities prior to setting up the scheme. Local authorities however informed us that the scheme had been designed without sufficient consultation, and that as a result it was difficult to bid for. OZEV has told us it will be publishing its plans for improving charging infrastructure in 2021. This will include consideration of different options to allow people without a driveway to charge their cars, for example ultra-rapid chargers in local areas or installing charge-points at the roadside (paragraphs 1.11, 2.15, and 2.17 to 2.22).

14 Government recently set DfT and OZEV targets for developing rapid charge-points across England's main routes. In May 2020, OZEV announced that a driver is never more than 25 miles away from a rapid charge-point on England's strategic road network. However, the government has recently set a new target for there to be at least six ultra-rapid chargers (quicker than the previous rapid charge-points) at each service area, with 10 to 12 in larger sites, by 2023. They expect this will lead to a rise to a total of 2,500 across the network by 2030, compared with just over 800 in January 2020 (an average of two per service area). The development of this network will be supported, in part, through the government's £950 million Rapid Charging Fund (paragraph 2.24).

Progress in reducing carbon emissions

15 Since 2011 there has been a reduction of around 1% in carbon emissions from passenger cars but this is a smaller reduction than DfT expected. In its 2013 strategy, OZEV had expected carbon emissions from cars would fall by 10 million tonnes between 2010 and 2020. DfT has tracked the average carbon emissions from all new car registrations, regardless of emissions category. The average emissions from new cars in Great Britain fell year on year between 2011 and 2016 – a total of 13% over this time. Since 2016, average emissions for new cars began to rise year on year – a total increase of 6% between 2016 and 2019. As ultra-low emission cars only represent a small proportion of the cars on the road (1.1%), the recent increase has been ascribed to several factors, which have cancelled out the reductions from ultra-low emission cars. These include: a rise in the sale of sports utility vehicles (SUVs); increased road traffic and travel by car; and revised methods for estimating carbon emissions given differences between emissions measured in laboratory conditions and those measured on the road (paragraphs 3.2 to 3.6, and Figures 13 and 14).

16 The government has committed to publishing a plan setting out how the UK will meet its target of cars emitting virtually zero carbon by 2050. Previous published plans have not regularly set out interim milestones for growth in the market and carbon impact. In November 2020, the government committed to publishing a delivery plan in 2021 for achieving the phase out of new petrol and diesel cars from 2030 and to consult on a regulatory framework for delivering the associated carbon outcomes. At the end of September 2020, there were 32.9 million cars registered in the UK, of which 1.1% were ultra-low emission. Changing the composition of the UK car fleet will take time, with the average life span of a car currently around 14.5 years. Although sales of ultra-low emission cars have increased since 2011, substantial growth is required to ensure ultra-low emission cars increase from current levels to 100% of the new car market from 2030. This will require significant changes in the automotive manufacturing sector, increases in the availability of public charge-points and consumer confidence (paragraphs 1.6, 2.3 and 3.6 to 3.8, and Figures 7 and 14).

17 Government still needs to manage some risks and challenges to meet the ambition of zero emissions from cars. In December 2020, we published a report on how government is organising itself to deliver net zero by 2050. Many of the issues we identified are relevant to managing the transition to zero-emission cars:

- *Cross-government action:* We found a well-integrated working relationship between OZEV, BEIS and DfT. They had common goals, shared data and had coordinated key policies. However, we identified a less effective relationship between the departments, OZEV and local government, with a lack of shared understanding of national and local strategies.
- *Managing interdependencies and wider stakeholder engagement:* The shift to zero-emission cars requires substantial contributions: from the private sector, in terms of car manufacture, research and investment; and from consumers, in terms of behavioural change. The shift also relates to other policy areas, such as clean air and the impact on the electricity grid.
- *Mitigating uncertainty:* Trade bodies and other stakeholders have said that the government's clearly stated goals to fully decarbonise cars by 2050 have helped to galvanise the automotive industry. However, they have also said that the lack of long-term certainty over the government's underlying plans, including its financial support, have at times hindered investment planning.
- *Resourcing and capacity:* A recent report by the Government Internal Audit Agency (GIAA) found that OZEV's capacity has been under pressure as the programme has grown. They also stated improvements were needed in OZEV's framework of governance, risk management and control to reflect the growth in the size and complexity of the programme (paragraphs 3.7 and 3.9).

Conclusion on value for money

18 Over the past 10 years government has spent more than £1 billion to incentivise the take-up of ultra-low emission cars. While there has been an increase in the number of ultra-low emission cars and the required charging infrastructure, carbon emissions from cars have not reduced in line with government's initial expectations. The lack of an integrated plan with specific milestones for carbon reductions from cars has resulted in a lack of clarity over what value the public money should be delivering. As a result, the departments have not been able to demonstrate value for money from the amounts expended.

19 The government has set an ambitious target to phase out the sale of petrol and diesel cars by 2030. The departments need to develop their detailed plans to achieve this goal and now is an important opportunity to learn from previous efforts. This will be a complex transition as moving away from traditional fuel involves significant changes for consumers, fuel suppliers and car-makers. The departments responsible for this transition will require the appropriate skills and capacity to monitor and support all the necessary changes. To achieve this, and deliver value for money, the departments need a much clearer plan for how they will deliver this societal change, focusing on delivering carbon reductions, not solely increased car sales; and a more targeted approach to addressing potential barriers to take-up across the country.

Recommendations

20 We make the following recommendations:

- a** **DfT and BEIS, working with OZEV, should set out clearly the carbon milestones they intend to meet on the way to delivering the 2050 target in their plan for the UK car fleet.** The projected carbon reductions should link clearly with their ambition to phase out the sale of new petrol and diesel cars by 2030 and the expected transition in the composition of the UK car fleet beyond that date. They should report progress against these milestones at regular intervals and take action should progress begin to lag against the plans.
- b** **Before publishing any plans for the coming decade, OZEV should use what it has learned from the interventions to date and examine what has worked well.** It should examine the scope for taking a more targeted approach, using data on car sales and charging points, to use public money effectively to address remaining barriers to take-up.
- c** **DfT and BEIS, working with OZEV, should set out clearly the added value they expect to deliver from the public money committed to supporting the transition in the car market and how they propose to monitor whether that value is delivered.**
- d** **DfT and BEIS, working with OZEV, should ensure the plan for transition explicitly recognises the interdependencies that need to be managed.** This includes the investment behaviours of the automotive sector and charging infrastructure companies; the link between take-up and the availability of appropriate supporting infrastructure; the tie-up between the strategies pursued by central and local government; and the potential longer-term impact on our electricity system including generation and network capacity.

- e **DfT and BEIS should review whether OZEV has the capacity, skills and remit to enable it to effectively oversee the fast-paced transition implied by the 2030 target.** Any oversight structure that is put in place needs to be able to work effectively across central government departments, local government, industry and the wider public. It will need appropriate commercial skills in place to stay in touch with a rapidly changing market and be able to assess the impact of public support in delivering the government's aims.