National Audit Office

REPORT

Public chargepoints for electric vehicles

Department for Transport

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Key facts

300,000
estimated minimum number of public chargepoints needed by 2030

64,632
number of open access public chargepoints installed as at July 2024

2,377
number of ultra-rapid chargepoints within one mile of the strategic road network at July 2024, against a target of 2,500 by 2030

15%	proportion of public chargepoints in England that are in rural areas, as at July 2024
£450 million	funding allocated for the Local Electric Vehicle Infrastructure (LEVI) Fund, to support local authorities in procuring chargepoints near peoples' homes, between 2022-23 and 2024-25
Over 100,000	forecast number of chargepoints that will be supported by LEVI
62%	of motorway service areas which reported they had six or more ultra-rapid chargepoints in July 2024. The government set an aim for all motorway service areas to have at least six ultra-rapid chargepoints by the end of 2023
Around 10%	estimated proportion of motorway service areas with enough power capacity needed to meet projected chargepoint demand to at least 2035
£950 million	funding announced for the rapid charging fund, intended to future-proof electricity capacity on the strategic road network

Summary

Background

1 Reducing emissions from road transport is the largest intervention the government can make towards its goal of achieving net zero carbon emissions by 2050. Transport is the most carbon-emitting sector of the UK economy, causing 28% of domestic CO_2 emissions in 2022, of which just over half came from cars and taxis. The government has committed to phasing out new petrol and diesel car sales by 2030, with all new cars and vans sold being zero-emission from 2035. A key way to encourage drivers to use electric vehicles is to provide public chargepoints. Drivers need to be confident that these are widely available and reliable enough to support the length of their journeys.

2 Public chargepoints are installed and maintained by chargepoint operators, private businesses who need enough people to use electric vehicles in an area for it to be profitable for them to install chargepoints. However, to give drivers confidence to switch to electric vehicles, these chargepoints need to be installed in sufficient numbers and at key locations. This may not happen at the pace and in the locations needed without government intervention.

3 The Department for Transport (DfT) leads on the strategy to reduce carbon emissions from cars. The Office for Zero Emission Vehicles (OZEV) is a team working across government to support the transition to zero-emission vehicles, with staff from both DfT and the Department for Energy Security & Net Zero (DESNZ), but which ultimately reports to DfT.

4 In 2022, DfT published *Taking charge: the electric vehicle infrastructure strategy* (the strategy), which set out its vision to remove charging infrastructure as a barrier to the adoption of electric vehicles, estimating that a minimum of 300,000 public charge points by 2030 would be needed to meet this. DfT identified that its role was to accelerate a nationwide rollout of public chargepoints and remove barriers to uptake. The strategy set out a series of commitments to achieve this, including allocating £1.5 billion to two key areas of government intervention where the market alone was unlikely to produce the outcome wanted.

- **Local chargepoints** so that people can charge their vehicle near where they live, typically using slower chargepoints overnight. DfT established a £450 million programme – the local electric vehicle infrastructure (LEVI) fund – to part-fund and support local authorities in England in this work. This built on its previous on-street residential charging scheme which awarded £84 million of grants to local authorities between 2017 and 2024.
- **Rapid charging on motorways and major A-roads (the strategic road network)** so that people can charge vehicles on longer journeys. The government needs to ensure that there is sufficient electricity capacity to support the rollout of rapid public chargepoints. In 2020, the government committed to set up a rapid charging fund to part-fund the capital costs of future-proofing electricity connections along the strategic road network, later announcing £950 million for this.

Scope of the report

5 This report examines whether DfT is achieving value for money in the rollout of electric vehicle infrastructure. We assess:

- whether DfT is on track to meet its ambitions for 2030 and the commitments in its strategy;
- whether DfT has set up to deliver its key interventions to support local charging and rapid charging on the strategic road network, and has effectively tackled barriers to installing more chargepoints; and
- whether DfT has intervened effectively to improve customer experience of charging infrastructure.

The fieldwork for this report was completed between June and October 2024. We previously examined governments efforts to support the rollout of infrastructure in our report *Reducing carbon emissions from cars* in 2021.[1] That report also examined DfT's broader efforts to encourage the uptake of electric vehicles, such as subsidy grants for drivers to purchase electric vehicles, which we do not examine in this report. Chargepoint numbers used refer to public, open access charging devices that are usable without a need for a specific make of vehicle. Devices may offer one or multiple connecting sockets. Except where otherwise stated, data relating to the number of chargepoints installed are provided by Zapmap (www.zap-map.com), who report they have coverage of over 95% of the network, meaning total numbers may be higher.

1 Comptroller and Auditor General, *Reducing carbon emissions from cars*, Session 2019–2021, HC 1204, National Audit Office, February 2021.

Key findings

Progress against the strategy

6 The number of public chargepoints being installed is on track to meet the 300,000 chargepoints that DfT estimated is the minimum needed by 2030.
As of July 2024, 64,632 public chargepoints have been installed, which is in line with DfT's expectations of what would be required at this point. The majority of public chargepoints have been installed through private investment, with around a quarter receiving part-funding from central government. DfT's LEVI programme currently forecasts that it will support the installation of at least 100,000 public chargepoints over the next few years, and DfT anticipates continued growth in private installations will support the trajectory needed to reach 300,000 by 2030. The precise number of public chargepoints needed is uncertain, and depends on several assumptions, including how people recharge their vehicles. DfT periodically refreshes its modelling of potential future demand for public chargepoints and, to date, the mix of rapid and slow chargepoints has proceeded broadly in line with expectations. DfT currently estimates that the demand for public chargepoints in 2030 will be in the range of 250,000 to 550,000. It had previously estimated a range of 280,000 to 720,000. DfT will need to continue to update the likely range to determine if the number of installations is on track (paragraphs 1.9 to 1.11 and Figure 3).

7 DfT's national estimate for a minimum of 300,000 public chargepoints does not consider their locations, which so far are largely in the south and in urban areas.
Chargepoint installation to date has been led by the needs of early adopters of electric vehicles. As a result, around 44% of all public chargepoints in the UK are in London and the South-East, with London alone having more than twice as many chargepoints per capita than any other region. Only 15% of chargepoints in England are in rural areas. DfT has designed its current programmes to help address regional differences but has no specific targets for how public chargepoints should be distributed across different regions and across urban and rural areas. DfT's ambition for the minimum number of public chargepoints by 2030 could be met without achieving the spread of chargepoints needed to support road transport across the whole country (paragraph 1.12 and Figure 4).

8 DfT has carried out the majority of commitments in its strategy. However, most of these were short-term actions, and DfT now needs to identify where it may need to intervene to support further growth. DfT's strategy contained 38 commitments intended to accelerate the pace of chargepoint installation, address barriers to installation, and improve public confidence in the public charging network. Over 75% of its commitments were expected to be complete within one year, as they were intended to lay the groundwork ahead of a period of rapid growth. Two years on from the strategy, 84% of the commitments have been carried out. DfT will need to assess what actions it needs to take to support a more mature chargepoint marketplace and a larger user population. DfT also plans to build on early work to support the decarbonisation of other vehicle types, such as heavy goods vehicles, that did not feature in its initial commitments (paragraphs 1.14 to 1.15 and Figure 5).

Progress with support for local charging and rapid charging on the strategic road network

9 DfT has increased the number of local authorities planning to install public chargepoints by applying lessons from earlier schemes. DfT designed its LEVI fund to avoid problems of low uptake and engagement. It also aimed to address regional disparities and better allocate money where it is most needed, with additional support to fund local authorities to employ staff to plan for public chargepoints infrastructure. DfT also established a central support body to provide technical advice and support. As a result, all eligible local authorities have engaged with the LEVI fund, and around half have developed a local chargepoint strategy with others in the process of doing so. DfT currently forecasts that LEVI will support the installation of at least 100,000 chargepoints, which would achieve the programme's objective to support the growth of the local chargepoint industry (paragraphs 2.3 to 2.8 and Figure 6).

10 DfT's local chargepoint programme runs until March 2025, but delays mean that many local authorities may need further government support. DfT launched the three-year programme in 2022 and, by October 2024, had issued £242 million of funding for local authorities to develop projects, including £40 million of capability funding. The speed with which DfT intended the programme to move placed pressure on local authorities, who had to build their capability alongside developing projects. It took local authorities longer to develop plans to DfT's standards than expected, and many intended to use a procurement route found to be infeasible late on in the programme. These issues have led to delays; as of October 2024, while virtually all local authorities had developed projects and were in the process of refining these, only 10 projects had been approved for delivery against a March 2025 deadline. Delays have meant that many local authorities will approach the market at a similar time, with concerns that this may lead to failed procurements. Local authorities who piloted the programme are reporting delays, with half of these projects delayed by a year or more. Local authorities report issues including a lack of resource, practical issues with sites, and challenges in securing planning permissions given planning capacity within local authorities. However, DfT intends to issue all remaining funding by March 2025, meaning, without further funding, local authorities will have to deliver their projects without further central support. The government allocated £200 million of funding to support charging infrastructure at the 2024 Budget, including local charging, but DfT has not yet finalised how it will spend this money (paragraphs 2.9 to 2.12 and Figure 6).

11 The number of chargepoints installed within one mile of the strategic road network that can charge vehicles quickly has grown faster than DfT expected. In 2020, the government announced its vision for an ultra-rapid chargepoint network along motorways and major A-roads, aiming to have 2,500 ultra-rapid chargepoints by 2030, rising to 6,000 by 2035.[2] As at July 2024, there are 2,377 ultra-rapid chargepoints and 2,220 rapid chargepoints within a mile of the strategic road network. However, there are currently stretches of major A-roads where there are currently not enough of these chargepoints. DfT is currently examining whether, given recent growth, these gaps are likely to be addressed by industry, and whether and how it may need to intervene in future (paragraphs 2.13 to 2.17 and Figure 8).

2 Statistics, except where otherwise stated, refer to open-access chargepoints that do not require a specific make of vehicle to use. The time taken to charge a vehicle depends on the size of its battery and the chargepoint speed. Ultra-rapid (150kW+) chargepoints will charge most vehicles from 20% to 80% within 30 minutes under ideal conditions, and rapid chargepoints (50kW–149kW) within 60 minutes. There is no industry-agreed definition of rapid and ultra-rapid.

12 There remain gaps in the distribution of ultra-rapid chargepoints at motorway service areas. DfT aimed for every motorway service area in England to have at least six ultra-rapid chargepoints by 2023. DfT anticipated that the private sector would be able to deliver this aim and did not have a good understanding of the barriers that would prevent it being achieved, such as the cost and time needed for even modest electricity grid upgrades. DfT did not allocate funding for this aim, and as barriers became more apparent, DfT engaged with motorway service area operators to encourage them to install chargepoints, assist them in requesting grid connections and also make use of other public sector schemes to improve electricity capacity. At the end of 2023, around half of motorway service areas reported they had at least six ultra-rapid chargepoints, increasing to 62% by July 2024. DfT anticipates that around 100 service areas will meet its ambition by July 2025. Including rapid chargepoints (all those at 50kW and above), there are an average of eight public rapid chargepoints per motorway service area (965 in total, of which 775 are ultra-rapid), but there is significant variation between different locations, with provision highest in the South East (paragraph 2.18).

13 DfT had not fully developed the rapid charging fund when it was announced in 2020, and it has proved more difficult than anticipated to implement. DfT analysis indicates that, at July 2024, only around 10% of the 114 motorway service areas in England had the power capacity they would need to meet rapid chargepoint demand to at least 2035, with around half needing to increase their capacity by between two and 10 times. In 2020, the government announced the rapid charging fund, intended to part-fund upgrades to electricity capacity on the strategic road network so that sites could meet future charging demand. DfT anticipated piloting the fund in winter 2022 before a full launch in 2023, but has only opened the pilot for applications in December 2023, with these currently being assessed. DfT redesigned and pushed back its pilot to navigate wider regulatory changes, competition concerns and the risk of legal challenge. Industry stakeholders have expressed frustration at how long it has taken to get this intervention up and running. Motorway service area operators have not typically invested in large energy infrastructure projects, applied for government funding, or needed to request major electricity connection upgrades from electricity network operators. DfT has engaged with the sector to build operators' capability and improve their relationships with electricity network operators. DfT is now assessing its options for how it intervenes further on the strategic road network, such as proceeding with further grant funding or using other means to fund network connections. Further delays to the delivery of network capacity risk it not being in place at sites to support charging demand when needed (paragraphs 2.19 to 2.22 and Figure 7).

14 Processes for planning permissions and electricity grid connections were not designed with chargepoint operators in mind, causing unnecessary additional cost and time to complete. Installing a chargepoint requires engaging with many different bodies, including national and local planning authorities, landowners, and electricity network operators. DfT has worked with industry to identify barriers and has established relationships with wider government bodies to address them. To date, the government has made some changes to make it easier to install chargepoints, but there remain areas for improvement which it is still considering. The government has acknowledged that processes to receive electricity grid connections are also increasingly unfit for purpose, resulting in waits of several years where substantial work is needed to improve network capacity. In 2023, DESNZ and Ofgem put in place a Connections Action Plan, containing a series of actions to address these issues. To date, there have been improvements in the rate at which connections are made, but the connections queue is still growing. Further improvements are intended through a new connections process currently planned for implementation in 2025, as well as through Ofgem's ongoing end-to-end review of the connections process (paragraphs 2.23 to 2.28 and Figure 9).

Improving user experience of charging infrastructure

15 DfT has put in place measures to address recent concerns with the consumer experience of public chargepoints, but will need to build its monitoring capability to respond to future issues. In 2021, DfT consulted on drivers' experiences of using chargepoints. This identified that using public chargepoints was becoming too complex due to each operator having different ways to pay. DfT also found that drivers felt pricing was unclear and were concerned that chargepoints might not be working when they tried to use them. In response, DfT introduced new regulations in 2023, which have progressively come into force since that time. These regulations require chargepoint operators to use a standard metric for prices, standardise payment methods, provide a helpline, and set a 99% minimum reliability standard for each operator's network of rapid chargepoints. It is too early to say if the regulations will work as intended. DfT will need to consider whether any changes are needed based on monitoring and consumer experience. For example, data on rapid chargepoints estimated reliability was at 97% across the entire network in 2023-24, and a snapshot of data from August 2024 suggests some operators still need to make improvements. DfT will need to monitor where less reliable chargepoints are located to ensure locations with persistent poor service do not emerge. Drivers who are solely reliant on public chargepoints pay more to power their vehicle than those with access to private chargepoints, and the government will also need to monitor whether the overall balance of incentives supports these drivers into the future (paragraphs 3.3 to 3.8, and Figures 10 and 11).

16 Rollout of public chargepoints to date has not met the needs of drivers with disabilities, and there is a risk that their needs will remain unaddressed as chargepoint numbers increase. By 2035, 1.35 million disabled drivers are expected to be partially or wholly reliant on public chargepoints. However, many current chargepoints, or their surrounding environment, have features which make them inaccessible to drivers with disabilities. DfT co-sponsored the creation of a new standard which specifies minimum requirements for chargepoint accessibility. However, DfT has not mandated its use, as industry and local authorities have reported that further clarity is needed on what constitutes compliance. DfT does not known how many chargepoints are currently compliant. DfT has established a working group to resolve these issues, including how accessibility should be reported. Should these issues remain unresolved during the continued growth of chargepoint installations in coming years, large portions of the future network could be inaccessible to drivers with disabilities (paragraphs 3.9 to 3.13).

Conclusion on value for money

17 A widespread, easy-to-use and reliable network of public chargepoints is crucial to ensuring that the UK is ready to meet the phase-out of petrol and diesel cars in 2030. To date, chargepoint numbers have increased in line with what is needed and the installation of 300,000 chargepoints by 2030, estimated to be the minimum needed, appears achievable. DfT is navigating a difficult delivery environment to bring its two main initiatives to launch, though later than anticipated. DfT needs to ensure that it manages the risks to the delivery of these programmes, and that they deliver the intended growth in the number of public chargepoints.

18 The sharp increase in public chargepoints expected over the rest of the decade needs to include a greater focus on where the chargepoints are located and how accessible they are. DfT and other government bodies involved must also be ready to meet the challenges and opportunities that come with this growth. Solutions to address costly and time-consuming barriers in planning and electricity network connections must be in place to meet the increased scale of installations needed. They must also monitor how people and chargepoint operators behave, to respond to emerging issues and intervene in areas that may disrupt the transition to electric vehicles.

Recommendations

19 DfT should:

a consider whether developing regional demand forecasts, and demand forecasts differentiating between urban and rural locations, would aid the rollout of public chargepoints;

b develop a set of strategic principles for intervention, to guide its design of future interventions where chargepoint demand may not be addressed by its existing programmes;

c work with local authorities, and the central support body it established to help them, to develop a plan for how to sustain the capability built through the LEVI programme after it ends;

d develop a monitoring framework for the open data it collects through the Public Charge Point Regulations, so that it can understand emerging consumer and operator issues in the chargepoint market, including where regional variations may emerge; and

e ensure that a clear understanding of what constitutes compliance to the chargepoint accessibility standard is determined, so that industry and local authorities can incorporate it into future installations.