Briefing

Boosting charging infrastructure to lead the EV revolution

June 2022

green alliance...

Summary

Accelerating the transition to electric vehicles (EVs) is vital to ensure more people can benefit from clean cars sooner, to futureproof the UK's automotive industry and to tackle emissions from transport.

The UK has made strong progress on charging infrastructure in recent years and its availability is higher than perceived, though it is unevenly distributed. To speed up progress, the government recently published its electric vehicle infrastructure strategy, outlining plans to accelerate the rollout of chargepoints across the country and ensure the UK is 'EV fit' by 2030.

This briefing provides an overview of the UK's progress so far, charging needs and where the government should strengthen its EV infrastructure strategy to fast track the transition to clean transport.

Keeping the UK ahead in the EV transition

Transport is responsible for nearly a third of the UK's carbon emissions, with cars responsible for 40 per cent of this. Transitioning the UK's car fleet to EVs is essential to reduce this impact. A rapid transition will also ensure more people benefit sooner from clean, cheaper to run cars and it will help to futureproof UK car makers for a rapidly changing global automotive industry. The government's ban on the sale of all new fossil fuel powered cars and vans by 2035, and its commitment to drive up the sale of EVs through the Zero Emission Vehicle mandate, have already put the UK at the forefront of the transition.

As of May 2022, there were over 880,000 battery electric and plug-in hybrid electric vehicles registered in the UK, and nearly all EV owners are satisfied with their vehicles, with only one per cent of battery electric vehicle (BEV) owners wishing to revert to an internal combustion engine vehicle. But a successful, widescale transition to clean cars depends on the availability of a comprehensive, convenient, affordable EV charging network.

Where and how often is charging needed?

Most EV owners charge at home. Around two thirds of households have off street parking, for example a garage or driveway. Other options for charging include workplaces, retail or leisure sites and public chargepoints. Availability of these alternatives is important to enable convenient charging, particularly for drivers who do not have off street parking.

Half of all drivers use their car so little they typically only need to charge fully twice a month. On average, fewer than one in 20 cars needs to be fully charged more than twice a week, meaning most EV drivers' needs are easily met by infrequent home or street charging.

Plug-in hybrid cars have significantly shorter ranges, so they require more frequent charging than fully electric cars. Unless they are regularly charged, plug-in hybrids lead to only a marginal decrease in tailpipe emissions compared to conventional petrol and diesel cars, and they are significantly more expensive to run than BEVs.

It is important that the charging network caters for different needs.

There are four types of chargers:

	Power	Time to fully charge an EV	Located where	Installation cost
Slow chargers	3-6 kW	8-10 hours	Homes, residential areas, and workplaces	£300-800
Fast chargers	7-22 kW	3-4 hours	Car parks, supermarkets, leisure centres	£400-900
Rapid charger	>50 kW	30-60 minutes	Service stations and urban areas	£1,000-1,500
Ultra-rapid chargers	>100 kW	20-30 minutes	Service stations, urban areas and specialised rapid charging hubs	£1,200 >
Smart chargers	These have features that enable drivers to charge at times when grid demand is lower or when there is a lot of renewable energy on the grid. These chargepoints have an interface or app that enables drivers to set when their EV charges, or the charger can automatically start charging at an optimal time. Drivers can override this function if they need to charge in a hurry. These chargers are installed in residential buildings. Smart chargers have an average output of 7kW. Installation costs begin at £800.			

In 2017, the government legislated that all new and replaced public chargepoints must offer standardised connectors, pushing manufacturers to make charging more convenient for EV users by allowing them to use any charging device.

To ensure chargepoint availability, operators must maintain an operable network or risk fines, meaning that typically nine out of ten chargepoints are working at any time.

How much does it cost to charge an EV?

In June 2022, it cost nearly £100 to fill up the average petrol car with fuel, to travel the same distance in an EV would cost around a third.

Those using smart charging and rooftop solar panels to charge their EVs will pay even less. And EVs require less maintenance than petrol and diesel cars.

As a result, despite currently having higher upfront prices, EVs are cheaper than petrol and diesel on a total cost of ownership basis (purchase price, tax, insurance, fuel and maintenance costs) over a seven year period.

VAT on charging differs between home chargepoints, which are subject to five per cent VAT, and public chargepoint users, who pay 20 per cent VAT. Even so, public chargepoints are significantly cheaper than filling an average car with petrol.

The current state of EV charging in the UK

How many chargepoints are needed?

The Climate Change Committee estimates that around 280,000 chargepoints will be needed by 2030 and most other forecasts suggest that 280,000 to 480,000 public chargepoints will be needed by 2030. The government aims to have a network of at least 300,000 public chargepoints by 2030.

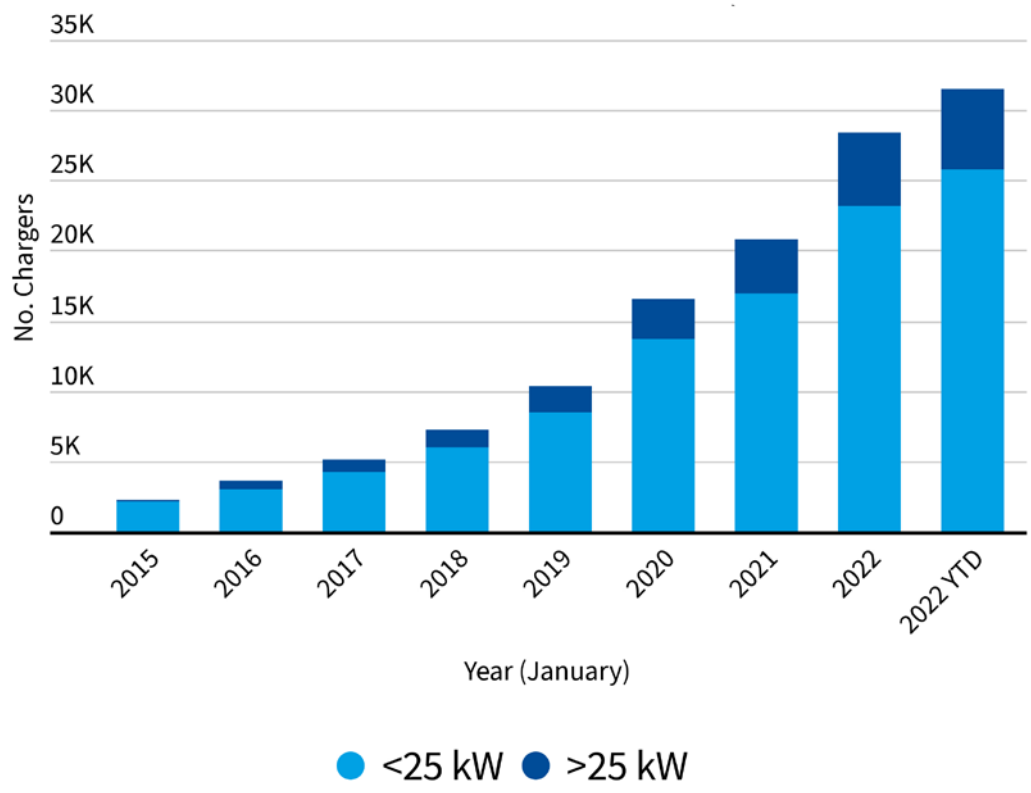
How many chargepoints are there?

The UK has made strong progress on installing charging infrastructure in recent years. As of May 2022, there are over 32,000 public chargepoints in the UK, up from 10,309 in January 2019, meaning there is currently one public chargepoint for every 15 BEVs registered in the UK, with more being installed all the time. An additional 3,100 chargers have been added so far this year.

The UK has more rapid chargepoints (those over 25 kW) per 100 miles of key roads than any other European country. When driving on motorways and A roads, drivers are never more than 25 miles away from a rapid chargepoint. There are also over 33,000 workplace charging sockets throughout the UK.

Installations are growing with over 3,000 installed so far in 2022.

UK charging network
(Chargepoint installations as of January each year)

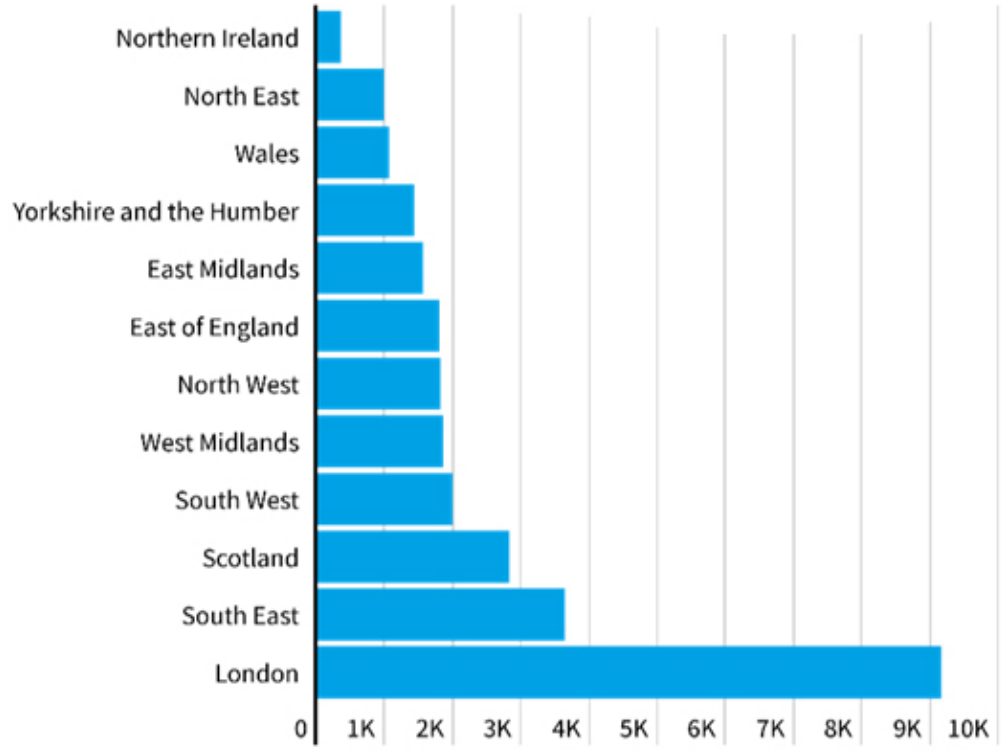


[Source: Transport & Environment, June 2022, *Delivering a world-class charging network by 2030, a UK approach*]

How are chargepoints distributed?

While there is a significant number of chargepoints available overall in the UK, there are big disparities between regions. Nearly a third of all the UK's chargepoints are in Greater London, equivalent to 101 chargepoints per 100,000 people, in contrast to Greater Manchester's 16.6 chargepoints per 100,000.

Number of chargers by region in 2022



[Source: Transport & Environment, June 2022, op cit]

The role of local authorities

Local authorities are responsible for deciding where chargepoints should be located and securing investment for public charging facilities. However, there is no specification of how many they should have in their area.

When planning the expansion of the EV charging network and the type of chargepoints required, local authorities must consider placement and potential demand from residents, commuters, visitors, delivery services and taxis. They also must ensure that charging is adequate for vans as well as cars. For example, charging cables must be long enough.

New Automotive has developed a toolkit for local authorities to ensure their charging infrastructure decisions are demand and data driven.

Who operates chargepoints?

The main providers of chargepoints are Ubitricity, Pod Point, BP pulse and ChargePlace Scotland. Together, they control three quarters of all public chargepoints in the UK.

Ensuring the electric vehicle infrastructure strategy is fit for purpose

The government's strategy to have a 300,000 public chargepoints by 2030 strikes a balance to ensure adequate charging supply without creating surplus infrastructure.

Existing funds committed to the charging network have been augmented by further funding in the Electric Vehicle Infrastructure Strategy. A £450 million infrastructure package has been allocated to local authorities for local public charging networks and to develop their plans. In addition, a £950 million Rapid Charging Fund will support delivery of 6,000 rapid chargers across England's motorways by 2035.

The strategy includes a requirement for all new homes and commercial buildings to install chargepoints. It refocuses Homecharge and Workplace Charging schemes to target support based on need. And it sets requirements for smart charging, reliability, accessibility and ease of use.

But, the strategy has placed the burden of delivery on local authorities without equipping them adequately. Funding for local authorities only runs until 2025 and it is unclear how it will be allocated. The 300,000 chargepoint target has no interim targets. And there are no requirements on existing commercial buildings to install chargepoints.

To provide a charging network that can support rising demand and encourage a faster switch to EVs, the government should build on its commitments in the infrastructure strategy in the following ways:

- **Support local delivery.** Local authorities are best placed to address the needs of their areas; however, they need detailed policy instructions and adequate resources to deliver the strategy.
- **Introduce interim targets.** The strategy would be strengthened by including interim targets for local authorities, so they can plan deployment and avoid delays.
- **Funding allocation.** The local electric vehicle infrastructure fund should be allocated based on local needs, including the number of cars registered and the number of chargepoints per BEV in each area.
- **Reduce VAT at public chargepoints** from 20 per cent to five per cent to match the rate paid at private charging devices, to ensure those without access to off street parking can benefit from cheap, clean electricity.
- **Allow flexibility on the target.** While current estimates suggest 300,000 public chargepoints by 2030 will be adequate, the government should be ready to respond quickly if it looks like demand will outpace supply.

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