

On the Road to 2030:

How the electric vehicle charging industry will enable the phase-out of petrol and diesel vehicles in the UK.

REA

About New AutoMotive

New AutoMotive is an independent data-driven transport research organisation, with a mission to accelerate and support the switch to electric vehicles in the UK. Our approach connects marketing, technology and policy to ensure consumer-focused change.

About The REA

The REA is the UK's largest renewable energy and clean technology industry body, representing around 550 member companies across the UK. The REA works to champion its member companies and promote a future built on renewable energy and clean technology through developing and advocating informed policy measures.

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On the Road to 2030

Part

Introduction



Introduction

The government has set a goal that by 2030 all new cars sold will come with a charging plug, and that from 2035 all new cars should be zero emission vehicles. Transport remains the largest emitting sector of the UK economy¹, meaning that a rapid transition to zero emissions road transport is critical to reduce climate risk.

As the government draws up the regulatory framework that will implement the 2030 and 2035 targets, in the form of a zero emissions vehicle (ZEV) mandate, it is critical that the UK is prepared for the rapid rollout of electric vehicles. This transition is already well under way, and ensuring a high level of preparedness is increasingly time sensitive. In 2022, just under 17% of all new cars sales were electric². In December 2022, electric vans accounted for 33% of new registrations³. Despite a tough year for vehicle sales overall, electric vehicles (EVs) have seen significant growth in sales of both cars and vans.

The transition to electric mobility offers a unique opportunity to not only significantly reduce carbon emissions, but also to attract investment and generate new, future-proofed jobs installing EV-related infrastructure and services. One of the largest markets that will grow out of the transition to electric transport is the market for charging infrastructure. The transition to electric vehicles will shift energy demand away from fossil fuels, and onto the electricity system, creating additional demand for electricity and electrical connections. Electric vehicles allow charging to integrate into motorists' lives, and rather than having to take a trip to the petrol station, motorists can instead charge up at home, at work, or while doing daily activities such as shopping. Most motorists will only need to take dedicated time out of their day to charge when completing long trips.

¹ October 2022, Department of Transport, [Transport and Environment Statistics 2022](#)

² January 2023, New AutoMotive, [Highest ever EV market share -Year Review & December 2022](#)

³ January 2023, New AutoMotive, [December and Year in Review: Electric vans claimed 8% of the overall market](#)

Charging infrastructure is largely being provided by the private sector in the UK, and recent years have seen significant growth in investment in the sector. ZEMO partnership has listed over 623 approved installers, and 68 manufacturing businesses operating in the UK. These businesses have developed quickly, during a period of huge growth in EV uptake in the UK.

The UK government has committed a total of £1.6 billion⁴ to grow the UK's charging infrastructure under the Electric Vehicle Infrastructure Strategy, which sets out a long-term vision for infrastructure in the UK. The strategy includes an aim of 300,000 available public chargers in the UK by 2030.

Despite the crucial role the public charging network has and will continue to play in the transition, the charging infrastructure industry has thus far remained largely unsurveyed. Given this, this report aims to provide the first comprehensive snapshot of the industry, as well as insight into its current state, future growth prospects, and any potential barriers to growth as we move forward to the 2030 phase-out date.

Public EV charging infrastructure in the UK has been criticised in recent years, and is cited by certain voices as a central reason why the UK's transition to EVs should occur at a much slower rate. In the process of researching the industry, we identified two recurring criticisms. The first is that charging infrastructure is not being installed quickly enough⁵. The second criticism is that charging via the public network is too expensive⁶, undermining the financial case for purchasing an EV, and facilitating economic inequality between households with access to cheaper home charging, and those reliant on (purportedly) more expensive public charging. With these criticisms in mind, this report aims to assess the UK's charging infrastructure roll-out, take a snapshot of the UK's current public network - to ascertain how the existing infrastructure industry is preparing for the future of the transition, and to obtain industry stakeholders perspective on current prospects for growth in the sector, and how best to unlock that growth.

⁴ March 2022, Gov.uk, [Tenfold expansion in chargepoints by 2030 as government drives EV revolution](#)

⁵ January 2022, The Guardian, [UK electric vehicle charging network is lagging behind, says Volkswagen](#)

⁶ September 2022, The RAC, [Public rapid EV charging costs rise 42% in four months](#)

About this report

In preparing this report, we carried out a survey of charging infrastructure operators, installers, and manufacturers. This consisted of a written questionnaire, as well as interviews. We also surveyed publicly available data from the four largest chargepoint operators in the UK, and performed analysis of public datasets made available by the Department for Transport, Field Dynamics, and Zap-Map.

We are grateful to the Renewable Energy Association (REA) for their help and support in obtaining data from those working in the UK's growing charging industry. We are also grateful to the European Climate Foundation for funding this work.

We endeavoured to take a snapshot of the whole of the industry ecosystem. To help achieve this we invited businesses which dealt with home, workplace or public infrastructure to contribute their perspectives to our research, so we could fully understand the broader charging infrastructure industry as a whole.

Survey

Central to our survey were four underlying questions:

- ▶ What is the current and potential future economic footprint of the industry?
- ▶ What are the industry's current growth plans?
- ▶ What are the key barriers to growth?
- ▶ How can growth be unlocked in the sector?

The survey consisted of 72 questions. These were a mixture of both quantitative and qualitative questions, designed to help us garner as clear a view as possible on the industry. The survey respondents represented a broad range of businesses in terms of size, age, and market share.

We received 24 survey responses, from businesses that install home, workplace, and public charging infrastructure. We received seven responses from chargepoint manufacturers, nine responses from chargepoint installers, nine responses from chargepoint network operators, and eleven responses from infrastructure service providers. Many respondents operate in a number of these areas simultaneously-accounting for the discrepancy in the number of responses. The survey respondents covered all types of chargers which we were accounting for.

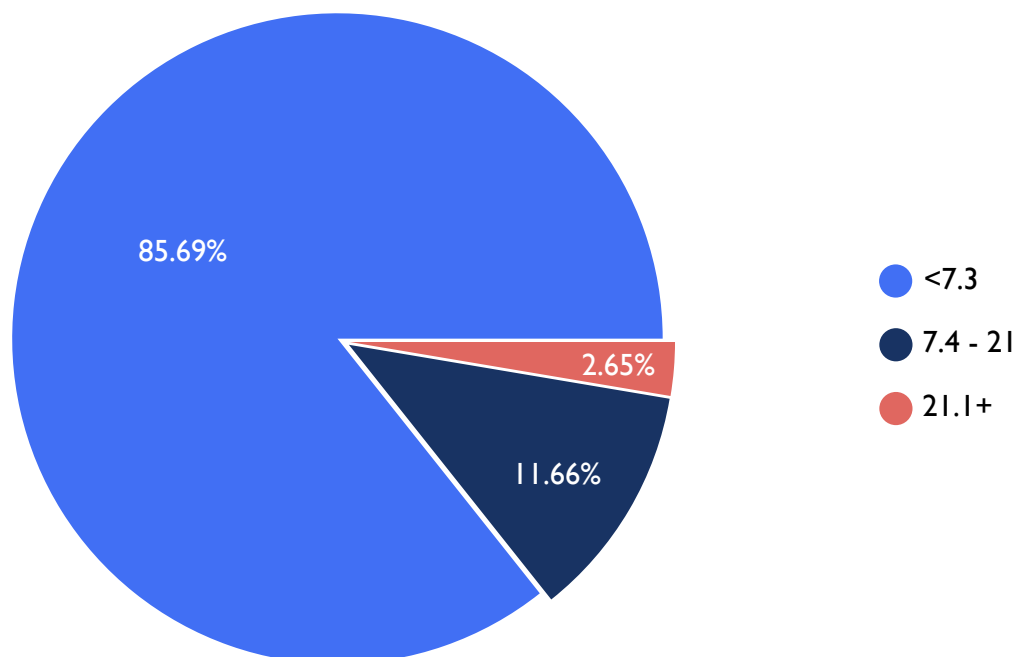
We followed up this survey based research with a number of long form interviews, in order to garner in depth detail on participants and the sector more broadly. These interviews used the survey questions as a starting point, diving further into the subjects covered.

Lastly, we carried out a survey of publicly available data from the UK's four largest public chargepoint operators. This was used to establish an indication of the prices that are charged across the UK's public charging network.

Chargers Captured

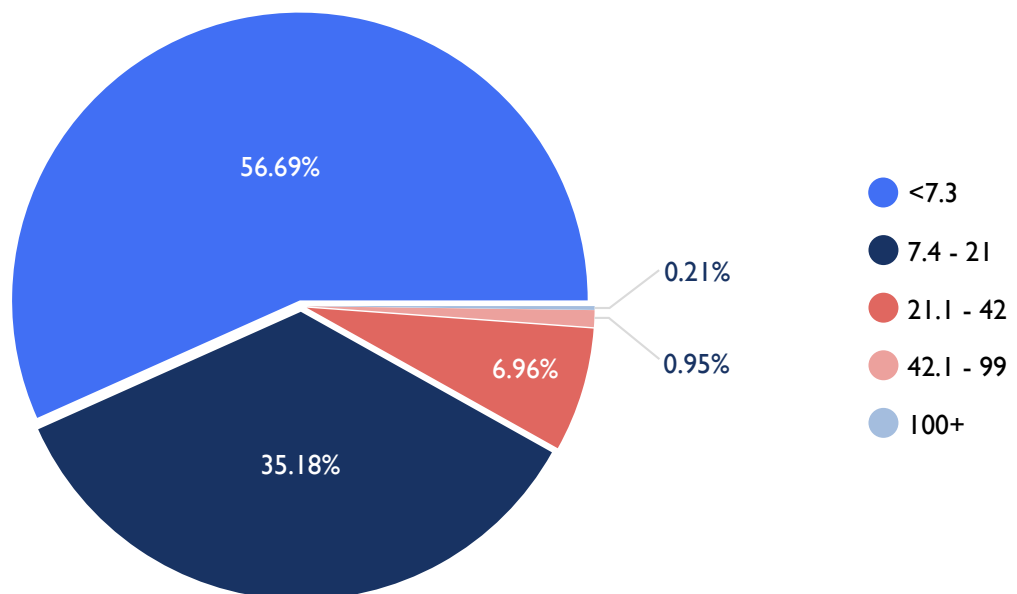
The respondents to the survey have collectively installed, manufactured or operated around 245,000 domestic chargers, with twelve respondents having installed, manufactured, operated or provided services for these chargers and eleven respondents having provided figures. The top three respondents accounted for 89% of the total captured home chargers in the survey. The majority of these captured chargers were <7.3kW chargers, highlighting the fact that the majority of home chargers are at the lower end of power due to the time spent and the cost associated with installing higher powered units. 12% of home chargers captured were between 7.4kW and 21kW.

Chart 1.1: Fraction of charge points across different power home chargers



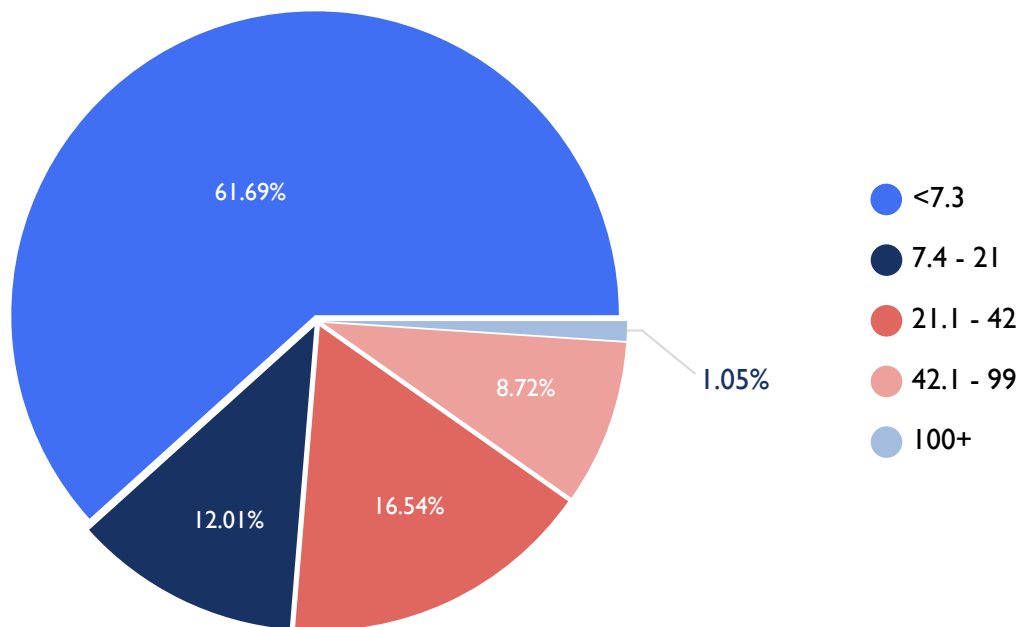
The survey captured a total of 48,145 workplace chargers, with fourteen responses indicating that they installed, manufactured, operated or provided services for these types of chargers. The top three respondents accounted for 85% of the total workplace chargers captured in the survey. The vast majority of workplace chargers captured in the survey were below 21kW, with 92% of the chargers being within this range. Again, these chargers were dominated by the lower speed chargers which are suitable for workplace charging due to the extended time users spent on premises. The vast majority of workplace chargers captured in the survey were below 21kW, with 92% of the chargers being within this range. 57% were chargers with a power rating of <7.3kW.

Chart 1.2: Fraction of charge points across different power workplace chargers



Thirteen respondents stated they were involved in providing public infrastructure and eleven provided figures, including the number of public chargers they are involved with. The survey captured a total of 12,721 public chargers, or around one third of all UK public charge points. The top three respondents operate 74% of the total captured chargers. The large majority of public chargers operated by respondents are slow chargers - less than 7.3kW. These tend to be chargers found in residential areas where vehicles spend a lot of time, and where rapid charging is unnecessary. Comparing this with the number of slow chargers nationally shows a slightly different picture across the whole of the charging network. The vast majority of public chargers are fast chargers (speeds between 7kW and 22kW)⁷. Fast chargers account for roughly 29% of the total chargers operated by respondents to our survey. Slow chargers account for the second largest group of chargers being installed in the country.

Chart 1.3: Fraction of charge points across different power public chargers survey responders



⁷ October 2022, Department for Transport, [Electric vehicle charging device statistics: October 2022](#)

It should be noted that, due to the way the numbers were captured, one charger may be recorded more than once if one business manufactured it, another operated it, and another installed it etc. The results of the survey are intended to give a snapshot of the industry rather than to accurately count individual chargers. The results showcase that the vast majority of charging is made up of private home chargers. Workplace chargers make up the second largest group, and the different types of public charging available in the UK make up the smallest group.

An overview of survey responses:

INSTALLERS

- The businesses employed 143 legally qualified engineers to install the charge points.
- Under current market conditions they expected to be able to install 55,670 chargers in the next 2 years.
- A typical home or workplace chargepoint installation typically took anywhere between 2 and 3,000 weeks.
- A typical public charger installation takes anywhere between 6 and 408 weeks.
- Problems which slow down delivery were listed as problems with wayleave, legal problems, grid and DNO problems.

 11 respondents

OPERATORS

- The businesses surveyed operated:
 - 4,940 residential charge points;
 - 20,910 Destination charge points;
 - 2,608 Transit/Rapid charge points;
 - 246 Fleet/work/depot charge points;
 - 100 Other charge points.
- Utilisation has tripled on average compared to utilisation figures from last year for all types of chargers on the public network.
- When looking for an area to place a charger, available grid capacity was the number one issue bringing in an operator into an area and land costs was the least consequential for the respondents.

 12 respondents

SERVICE PROVIDERS

- The business provided charging management; customer/driver support/EV billing; software and hardware management; energy management; technical operations; database management; E-roaming; and other services.

 15 respondents

MANUFACTURERS

- The businesses had manufactured a total of 297,920 chargers for the UK market.
- Many of the businesses assembled the charging equipment in the UK, other places included Norway and Romania.
- The original manufacturing of the components were spread across the world with many coming from either Europe or China.
- They have plans to manufacture a total of 136,000 for the UK market in 2 years time

 7 respondents

Definitions

Electric vehicle charging infrastructure comes in many forms, with different types of chargers and connectors available. We use the following terms to refer to the different kinds of charging.

Public residential	These are chargers which are based in residential areas but are available to the public. These tend to be self-styled lamp post chargers and are usually found in areas where off-street residential parking is unavailable. As these are in residential areas where vehicles are spending larger amounts of time, they tend to be slow chargers.
Public destination	These are public chargers which can be found anywhere where motorists spend an extended amount of time. This includes shopping centres, hotels, restaurants, and attractions. Due to the fact that motorists are generally expected to spend a number of hours at these establishments, destination chargers tend to also be slower chargers.
Public en-route/rapid	These are public chargers which are found in areas where motorists will be looking to extend the ranges of their EVs. They are found in every service station on the motorway in the UK and are the fastest way to recharge an EV.
Private home/domestic	These are chargers that are not part of the public infrastructure network. They belong to motorists with private off-street charging available. New AutoMotive research indicates that around two thirds of all households in the UK are able to support private off-street charging. Again, due to the fact they are found in residential areas, they are usually slower chargers.
Private fleet/ work/depot	These chargers that are not part of the public infrastructure network. They represent chargers at offices, depots, or other types of businesses which are reserved for employees or vehicles which are used by the business.

Community/shared charging	Electric chargers that may be privately owned but are on a network which allows the sharing of chargers between a group. This is sometimes done through an app.
Chargepoint network operators (CPOs)	CPOs maintain EV chargers, and also tend to install them and operate them.
Infrastructure manufacturers	Businesses which are involved in the making of hardware for charge points, either in whole or in part.
Infrastructure service providers	Businesses which provide services including but not restricted to charging management, energy management, technical operations, customer/driver support, EV billing, software and hardware management, database management, E-roaming.
Chargepoint Installers	Businesses involved in the installation of chargers from site identification to final installation.

Part 01

On the Road to 2030

The Current Picture



The Current Picture

A successful transition to electric vehicles is only possible with charging infrastructure in place that allows people to charge their vehicle at a reasonable price, where and when they want. For the vast majority of people, this will mean that they charge their car at home, on a driveway next to their house, overnight. Surveys suggest this is how the vast majority of electric car drivers charge already.⁸ However, an estimated 8 million households outside of London have no off-street (driveway) parking⁹ (though it is not known how many of these households are car-owning).

As the UK's car parc becomes increasingly electrified, charging at places of work, at publicly available infrastructure along the strategic road network, or in residential streets will become increasingly in demand. To accommodate this demand, the UK government has an ambition that there should be at least 300,000 public EV charge points by 2030.¹⁰

In this section, we provide an overview of workplace, domestic, and public EV charging infrastructure. For each, we will provide an overview of trends in the rollout, and assess recent electricity price trends.

⁸ April 2022, [BritainThinks 'Electric Vehicle Charging Research'](#)

⁹ 2020, [Field Dynamics 'On-street Households'](#)

¹⁰ March 2022, Department for Transport 'Tenfold expansion in charge points by 2030'

Workplace and Domestic Charging

Surveys suggest that more than 90% of EV drivers have access to off-street parking where they regularly charge their car.¹¹ Electric car owners are most likely to charge at destinations where they stay for an extended period of time with their car parked in one location. It therefore follows that charging at home or at work will be the most practical charging option for many. Given this, it is important that these private and semi-private networks are established, as to ensure that the public network can be freed up for those without access to these networks.

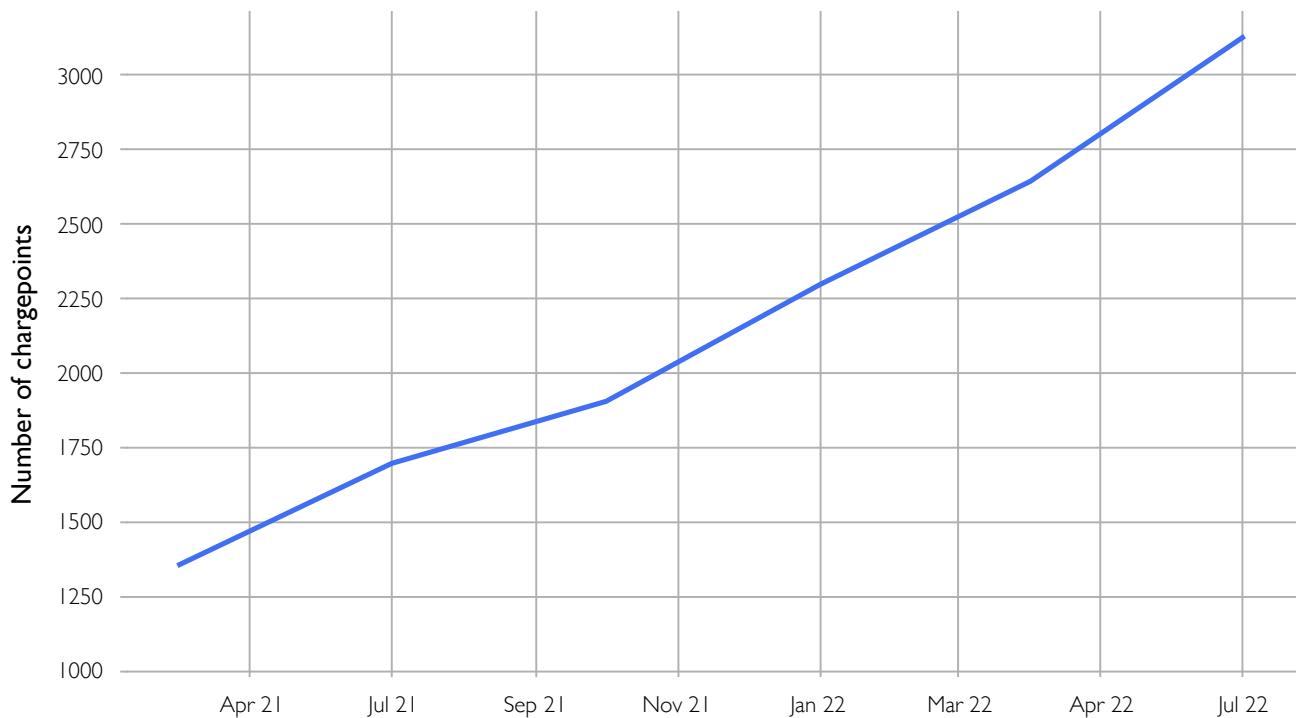
It is difficult to determine an exact figure for the number of home and workplace chargers in the UK. However, the uptake of the Department for Transport's Electric Vehicle Homecharge Scheme (EVHS) grant for home chargers and the Workplace Charger Scheme (WCS) for workplace chargers gives some insight into the number and distribution of home and workplace chargers across the country. The real number of charge points is likely to be higher than the DfT's statistics suggest, but these statistics still give a good indication of the size of the workplace and home charging network. Since March 2022, these government grants have been rolled back. This means it is now harder to track the rollout of these types of chargers. The government should find a way to track the continued roll-out of work and home chargers in order to develop a more complete picture of the overall charging infrastructure network.



¹¹ April 2022, BritainThinks 'Electric Vehicle Charging Research'

Extent

Chart 1.1: Number of workplace chargepoints installed with DfT Grants



Source: New AutoMotive analysis of Department of Transport data

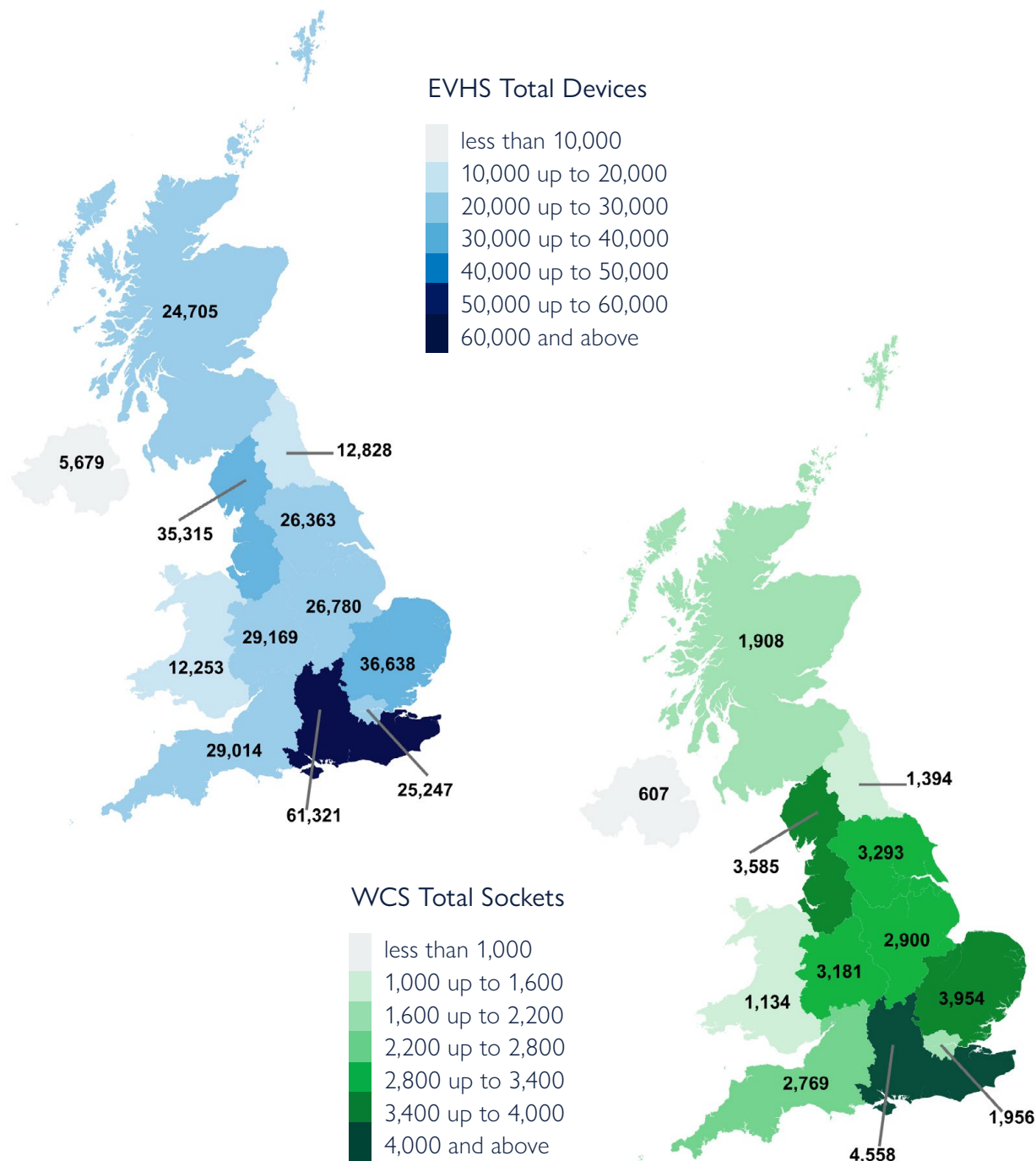
As of July 2022, 368,990¹² domestic electric vehicle charging devices had received the EVHS grant and a total of 36,275 sockets had been installed in workplaces. The number of workplace chargers installed with the support of a grant almost doubled in the 12 months prior to October 2022 from 19,000 to 36,000. Since DfT began its statistical series in April 2021, the number of workplace chargers installed with the support of these grants has roughly doubled in the year to each quarter. This trend would imply that at least half a million workplace chargers will be installed by 2026.¹³

The distribution of these grants can be seen in Map 2.1, which shows the distribution of awarded EVHS and WCS grants by region. The South East has seen the largest number of grants for both home and work chargers, with 51,321 home chargers and 4,558 workplace chargers installed through the grant scheme. Northern Ireland has experienced the lowest number, with 5,679 home chargers installed and 607 workplace chargers.

¹² DfT [Electric vehicle charging device grant scheme statistics: July 2022](#)

¹³ New AutoMotive's own analysis of DfT's Workplace Charging Scheme Statistics, taking the average growth rate of workplace chargers installed using the WCS scheme and extrapolating the trend into the future.

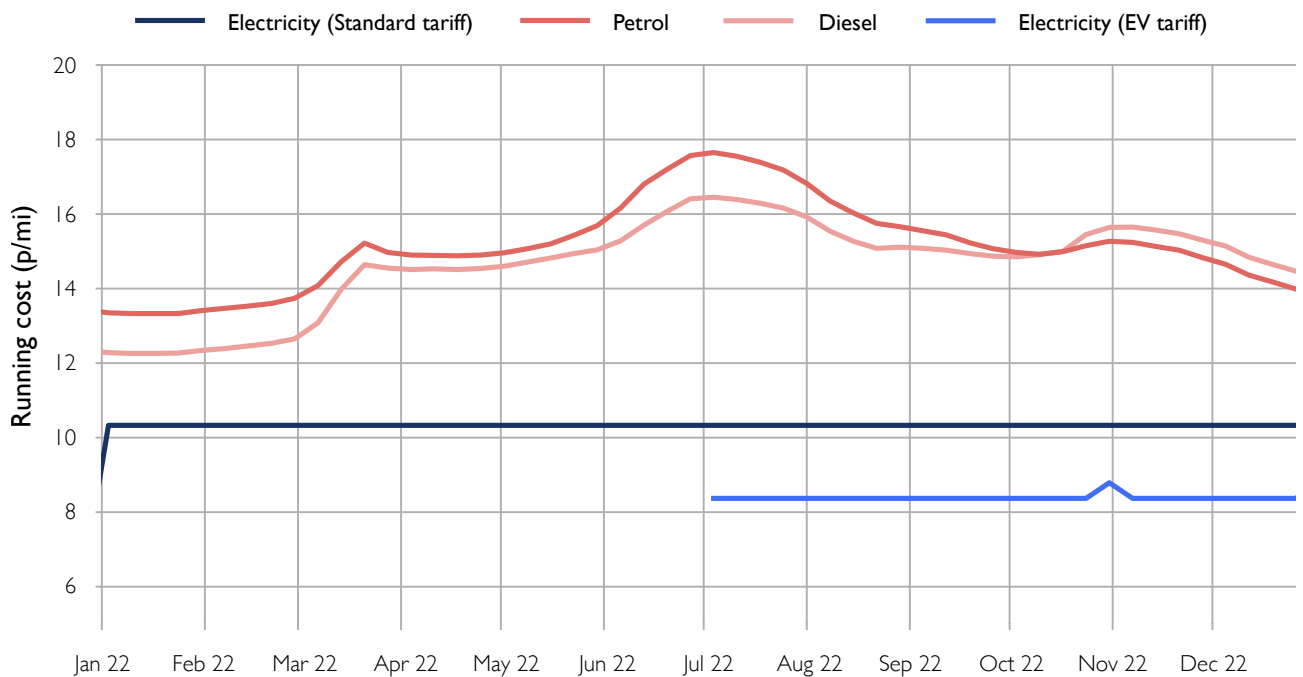
Map 2.1: The distribution of EVHS and WCS grants in the UK total devices



Source: Department of Transport Electric vehicle charging device grant scheme statistics: [July 2022](#)

Cost of Charging

Graph 2.2: Fuel type running cost per mile comparison under new energy price cap



Source: New AutoMotive analysis of costs using average efficiency figures

The energy crisis that the UK is currently experiencing means running a car has become considerably more expensive over the course of 2022 - regardless of the vehicle's fuel type. Due to the numerous ways an EV can be 'refuelled', the cost of running an electric car is less straightforward to work out than the running cost of a fossil fueled vehicle. In October 2022, the government stepped in to introduce a cap on electricity prices, setting them at 34 pence per kWh, and this has ensured that on a standard energy tariff, running an EV is cheaper than running a diesel or petrol car. Graph 2.2¹⁴ shows that the average diesel vehicle costs 14.65p per mile to run and the average petrol vehicle costs 14.18p per mile, in comparison to 11.76p per mile to run an EV. This is further reduced on an EV specific tariff where it costs on average 8.74p per mile to run an electric car charged during off-peak times set by the energy company. For electric vans running at the average efficiency it will cost businesses 8.1p per mile to charge, and for electric cars being charged at business premises it would cost just 7.3p per mile.

¹⁴ Figures correct as of January 2nd 2022. Figures calculated by New AutoMotive

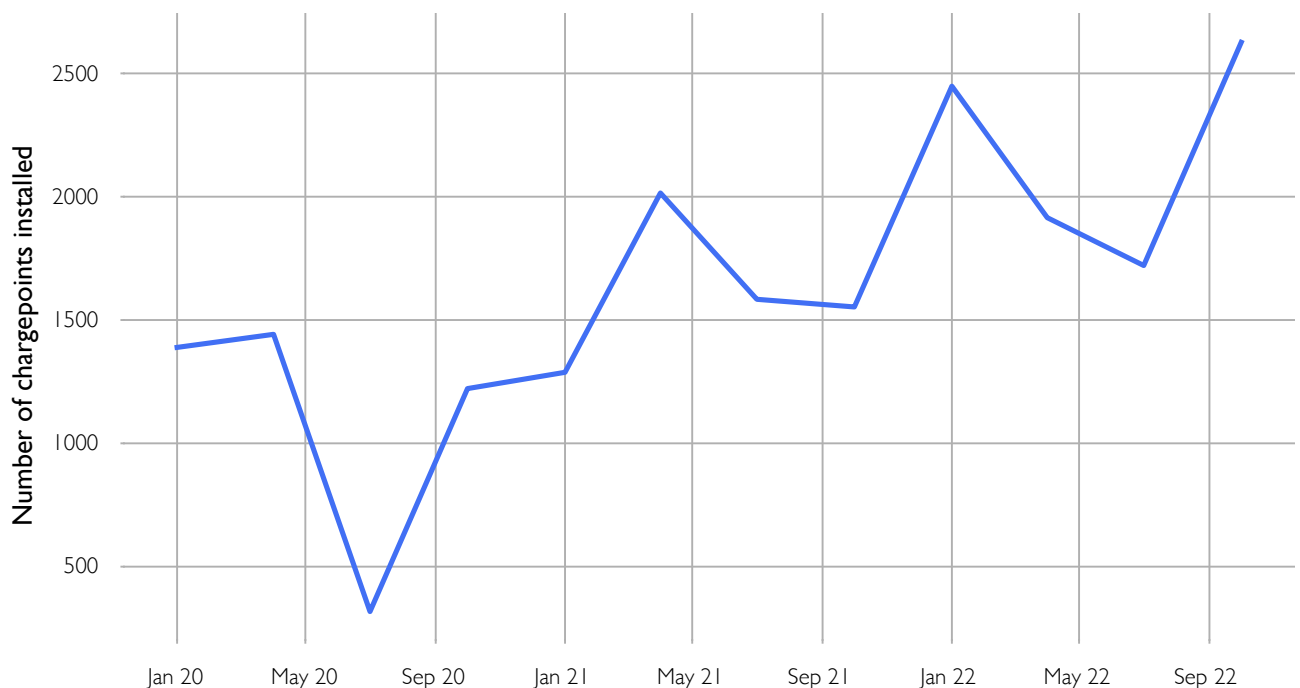
Exact figures for workplace charging costs are more difficult to determine. Many workplace chargers remain free for employees to use, and are offered by employers as an employee benefit.¹⁵ This represents a significant benefit for employees, where it is available. Figures for home and work chargers show a large supplementary network of private and semi-private chargers that will play a role in ensuring that EVs remain a mode of transport which can simply and conveniently slot in with motorists' everyday routines.

Public Infrastructure

Recent Growth

The UK has a rapidly growing public chargepoint network. There were a total of 34,637 public electric vehicle charging stations in the UK as of October 2022.¹⁶ There has been a 34% increase in the number of installed charge points since October 2021. There was a strong growth in quarterly new charge point installations, with 2,26 new charge points installed over the quarter ending in October 2022 - a new record.

Graph 2.3: Year-on-year percentage growth in chargepoints



Source: New AutoMotive analysis of Department for Transport statistics

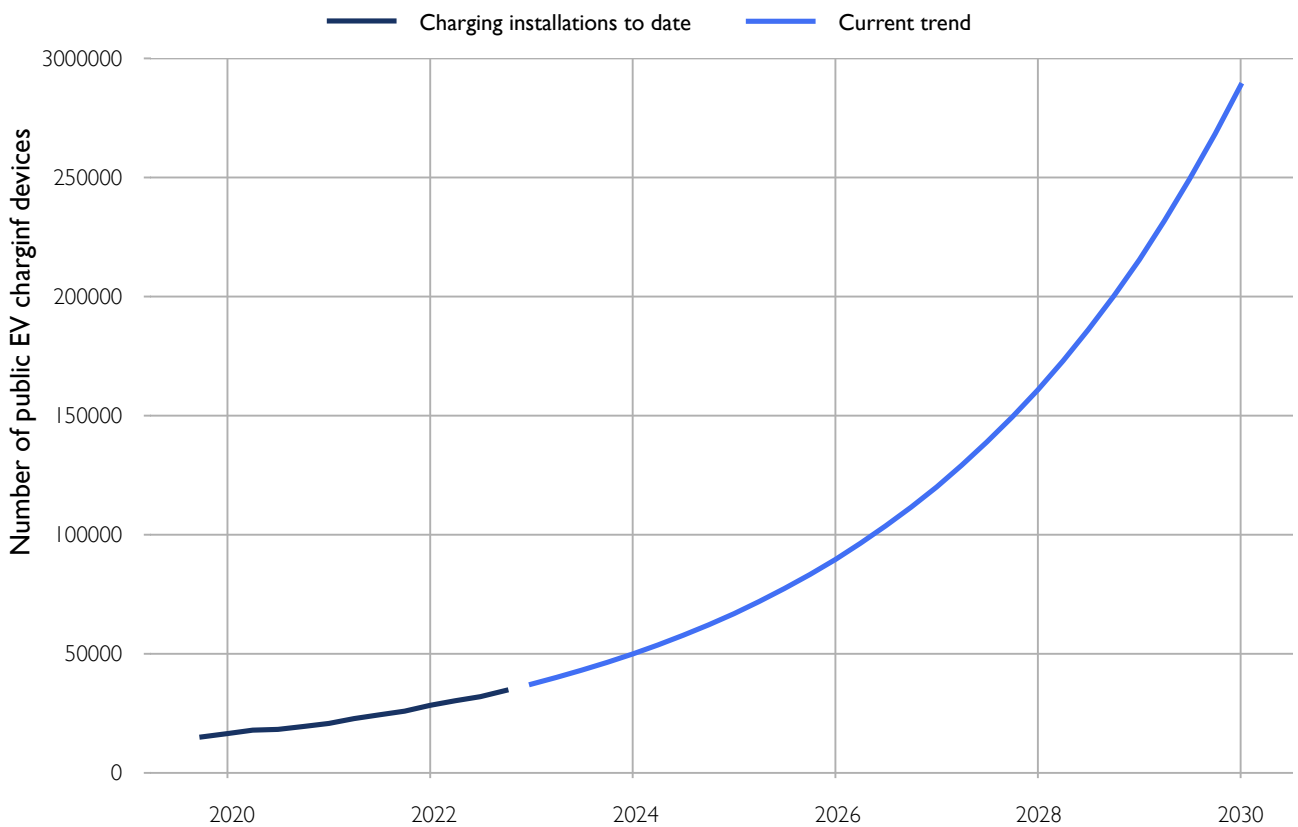
¹⁵ July 2020, FleetNews, [How to implement a successful workplace charging scheme](#)

¹⁶ October 2022, DfT ['Electric vehicle charging device statistics: October 2022'](#)

Percentage growth year-on-year of public charge points in the UK, shows an uptick in deployment since April 2021.

The number of charge points is growing at around 30-35% per year, having recovered following coronavirus lockdowns which interrupted installation projects and caused some public sites to close and no longer be considered ‘public’ charge points. This trend represents very strong growth. If it continues, the UK looks set to be able to hit the government’s 2030 target. Furthermore, several chargepoint operators have made public commitments to scale-up charger installations. Ubitricity has committed to have installed 50,000 on-street EV charge points by 2025,¹⁷ and 100,000 by 2030.¹⁸ Connected Kerb has committed to install 190,000 chargers by 2030.¹⁹

Graph 2.4: Current and trend public EV charging installation



Source: New AutoMotive trend analysis

¹⁷ Sep 2021, Ubitricity ‘Shell aims to install 50,000 ubitricity on-street EV charge posts across the UK by 2025’

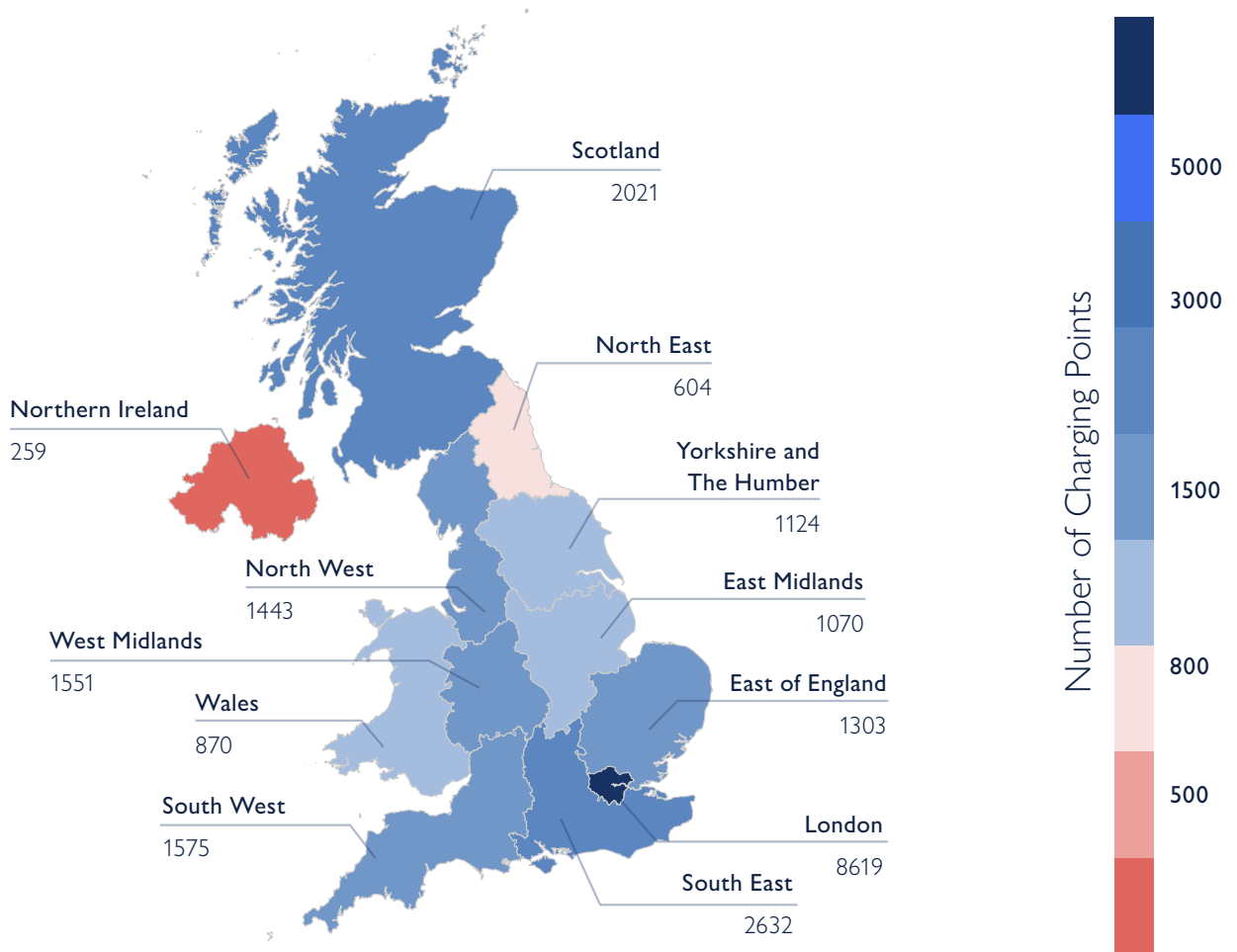
¹⁸ May 2022, Shell ‘Shell aims for 90% of drivers to be within 10 minutes’ drive of a shell rapid charger by 2030’

¹⁹ Nov 2021, FleetNews, ‘Connected Kerb to install 190,000 EV chargers’

Extent

Map 1.1 shows the distribution of public infrastructure throughout the UK. London has the largest number of charge points, with 8,619 in the region, compared to Northern Ireland, the lowest ranked region with just 259 chargers. This is to be expected; London has a significantly higher share of households with no access to off-street parking than much of the rest of the country. Investment has occurred in urban areas where there is a greatest concentration of need for on-street charging. The vast majority of these installations are fast chargers, with a total of 19,746 chargers. 50% of all charging devices were classed as destination chargers and 32% of all charging devices were designated as on street chargers.

Map 2.2: Map of the density of EV chargers by region in the UK



Cost of Charging

The cost of charging is more difficult to ascertain for public infrastructure than for home and workplace charging. This is due to the fact that prices can vary across different providers, sites, and times for those working on a variable tariff. We surveyed charging prices at a range of charge points from the UK's leading providers to produce a map of the country with the average prices of chargers available in each region. It shows there are differences in pricing across the UK. Scotland was, on average, the cheapest area to charge in, with the price at £0.30 (which is lower than the capped domestic household electricity cost under the Energy Price Guarantee).²⁰

Northern Ireland came in as the most expensive region, with charging costing an average of £1.93. The gap between costs in Scotland and Northern Ireland further demonstrates the considerable variation in prices from region to region. Northern Ireland also came in last for charger density - this may contribute to the price disparity between the region and the rest of the country. It is important that Northern Ireland is supported in developing adequate infrastructure in order to help bring down the price of charging. However, Northern Ireland was an outlier, with the rest of the regions costing between £0.29 - £0.54 - a significantly smaller variation in regional prices. Looking at the whole of the UK, a total of 3,500 charge points sampled were charging below the cap on domestic electricity tariffs - see Table 2.1. Meaning, if used at the time sampled, they would have cost motorists less than if they were charging from home on a non-EV specific tariff.

It should be noted that the government announced that from April 2024 energy support for firms will be reduced from April²¹ and firms will get a discount from the wholesale prices rather than a capped price. Those in 'energy intensive' industries will be targeted for higher discounts. There is no indication that those providing chargers to the public will be classed as such a business. It is important that these businesses are supported in order to help keep costs lower for those relying on the public network.

²⁰ November 2022, BEIS, [Energy Price Guarantee](#)

²¹ January 2023, BBC News, [Energy bill support for firms to be reduced from April](#)

Map 2.3: Regional average price of chargers

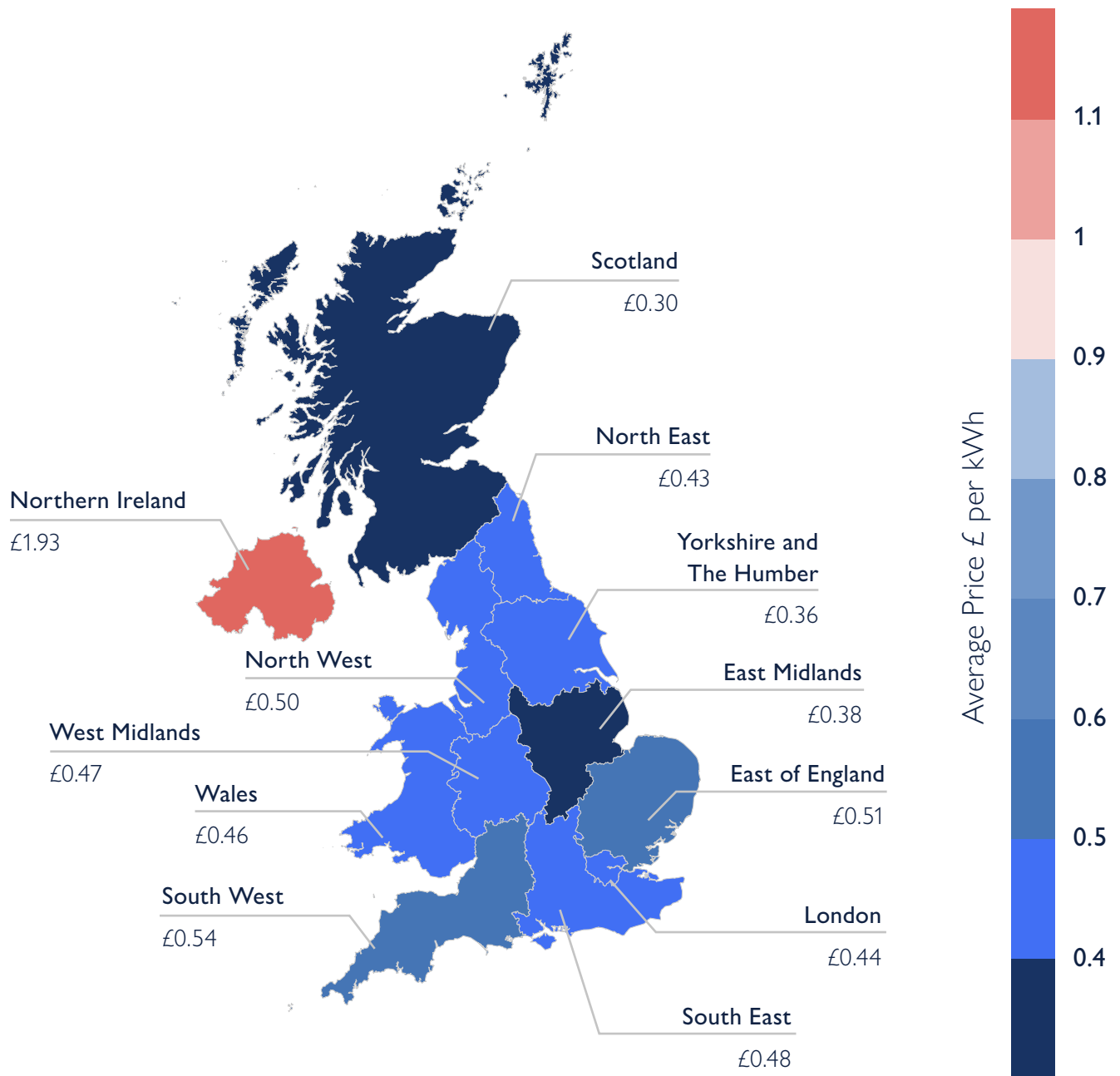






Table 1.1: Chargers below the domestic electricity rates

Network	Total Chargers	Total Chargers advertising a price of 34p/kWh or less	% of network with sub-domestic rates
	2062	952	46.17%
	3335	538	16.13%
	6058	989	16.33%
	2333	1021	43.76%

Source: New AutoMotive analysis of chargepoint price points

Economic output

The businesses we surveyed were all relatively young. The oldest was formed in 2009, and the newest in 2022. Just eight of the companies were formed before 2015, with the rest of the respondents having developed in the last seven years. Age was a strong indicator for both size and annual turnover, with those businesses that had formed between 2019 and 2022 (of which there were seven) being the smallest in terms of revenue and turnover.

The size of the infrastructure businesses varied, with the majority being small businesses with under 50 employees. These small businesses have a combined annual turnover in the UK of £15,200,000. Although only representing 24% of respondents, the businesses with 101+ employees represent 77% of the combined annual turnover and 77% of those employed by the businesses that completed the survey. It is important to note that this survey does not seek to be representative of the industry - one interviewee noted that they estimated the total number of people employed in the industry to potentially be in the six figures.

Number of employees	Number of businesses	Total combined annual turnover (£)	Total combined number of employees
1-50	14	15,200,000	337
51-100	12	12,000,000	159
101+	5	93,400,000	1,639

Part 02

On the Road to 2030

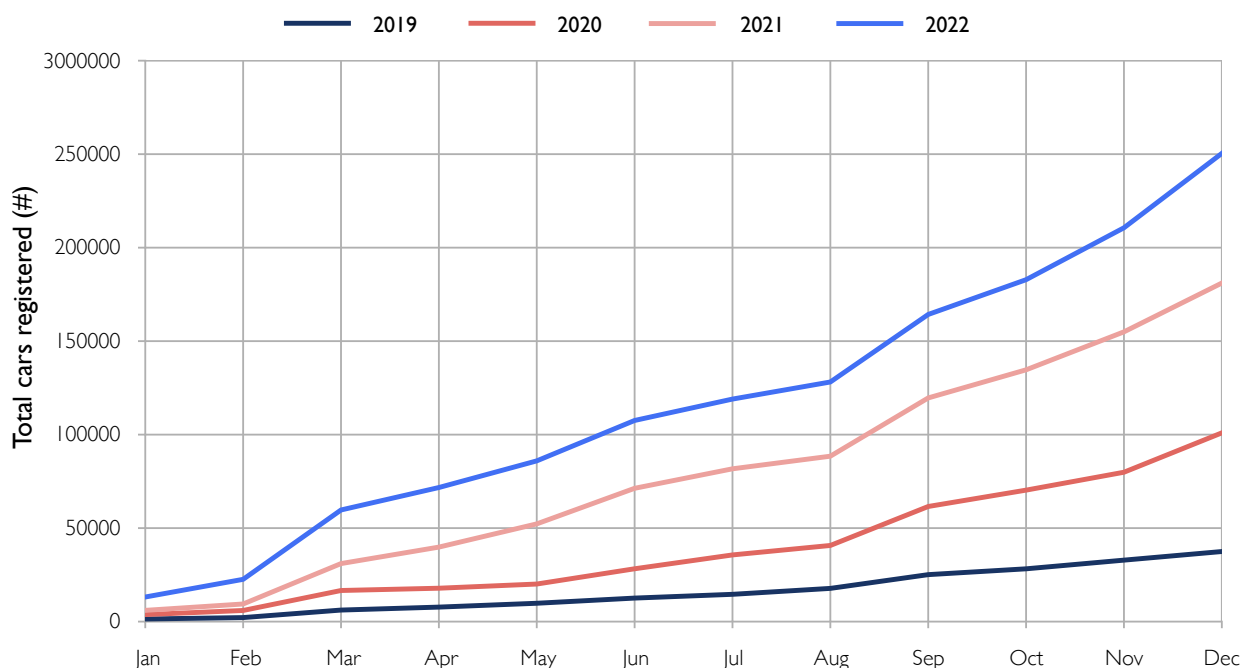
The Barriers

Introduction

EV sales have grown rapidly in recent years, but are now growing at a more steady rate. The graph below shows the cumulative total of EV registrations for each year since 2019. So far in 2022 207,576 have been registered compared to 181,057 registered in 2021.

It is important to note growth in EV uptake is still occurring, just at a slower rate than the more explosive growth we have seen in the previous years. This more steady, less rapid growth has affected the domestic charging industry, which feels the effect of slower growth first, through a decrease in demand for home charging units. Podpoint²² has released a profit warning for 2022-23, as it prepares for a period of slower growth. Broader external pressures, such as the Global energy crisis, supply issues, and the cost of living crisis in the UK, impacted new car sales in 2022, seeing the market shrink 3% year-on-year. It is crucial that the infrastructure industry is supported and investments do not slow down the rate of public infrastructure development in coming years.

Graph 3.1: Number of EVs registered in the UK cumulatively over the past five years



Source: New AutoMotive analysis of DVLA registration data

²² Nov 2022, Peter Campbell, [Electric car charger Pod Point issues profit warning on delayed home installations.](#)

A key aim for our survey was to establish what potential barriers could slow the growth in the sector, and what enablers could help the UK’s infrastructure rollout accelerate. We asked survey respondents about the main barriers that they believe are currently limiting the growth of their businesses, and which of these barriers they believe the government can help them overcome. The survey respondents indicated a number of key barriers which must be broken down in the lead-up to 2030. This section highlights some of the key problems identified. These barriers must be addressed in order to ensure the continued and fast-paced growth of the network.

Growth Barriers for businesses in infrastructure

Intervention Points ↴

Lack of action and/or support from local authorities	<ul style="list-style-type: none"> • Targeted engagement with local authorities with high numbers of households that have no access to off-street parking. • Funding allocated by assessments of future need, as well as clear guidance on how to adequately spend this in the LA.
Slow response from distribution network operators	<ul style="list-style-type: none"> • Work with the operators to come up with a streamlined system.
Shortage of supply/supply chain pressures	<ul style="list-style-type: none"> • Make sure the supply chain is adequately mapped out in order to help identify bottlenecks quickly.
Gaining planning permission	<ul style="list-style-type: none"> • Speed up and prioritise planning permissions for chargers. • LAs to prioritise these requests.
Grid Connection costs	<ul style="list-style-type: none"> • Planned policy coming into effect in April 2023 which changes the way grid connections are funded should
Shortage of skills and/or labour	<ul style="list-style-type: none"> • Re-education of the workforce towards a net zero economy including training for access to the charging industry.

<p>Acquiring freehold/leasehold of land</p>	<ul style="list-style-type: none"> • The government should build on responses to a call for evidence on access rights for electricity network infrastructure in order to make it easier to install electrical connection equipment for infrastructure provision.
<p>Agreeing wayleaves and/or easements</p>	<ul style="list-style-type: none"> • The government should build on responses to a call for evidence on access rights for electricity network infrastructure in order to make it easier to install electrical connection equipment for infrastructure provision.
<p>Access to finance and/or funding</p>	<ul style="list-style-type: none"> • Government commitment to continue to support the industry especially as we enter a period of slower growth in EV adoption. • Policies such as a ZEV Mandate will help to enable growth and secure investment in the sector
<p>Poor implementation/enforcement of otherwise sensible regulations</p>	<ul style="list-style-type: none"> • Industry led regulation which will help to improve the effectiveness and targeting of regulation whilst still being consumer driven.
<p>Uncertainty around future regulations</p>	<ul style="list-style-type: none"> • Industry led regulation which will help to improve the effectiveness and targeting of regulation whilst still being consumer driven.
<p>Opposition from local residents and/or businesses</p>	<ul style="list-style-type: none"> • Continued education on the benefits of having EV infrastructure near to your business or home. • Regulation on minimum charging infrastructure deployment may help to minimise vocal opposition.



<p>Exclusivity agreements preventing access to market</p>	<ul style="list-style-type: none"> • A review of exclusivity agreements. A review is currently taking place on whether exclusivity agreements should be waived at motorway service stations.
<p>Lack of sources of open EV charging data</p>	<ul style="list-style-type: none"> • The government has tendered a contract to look into open data resources for the UK. It is important this is sped up and legislated for, as it has been in the EU, in order to ensure correct reporting of public charge points.
<p>Uncertainty around future technical standards</p>	<ul style="list-style-type: none"> • Good communication between industry and the government in order to ensure industry security.
<p>Lack of user demand (i.e low EV adoption)</p>	<ul style="list-style-type: none"> • Implementing an effective ZEV Mandate, to help ensure the adequate supply of EVs into the UK. This will enable supply into a rapidly growing market, which is currently struggling to match supply with demand. • It is important that the mandate is industry pushing, rather than just a backstop, and is free of loopholes. • Continue to push EVs as the future of transport and the affordable option in a cost-of-living crisis.
<p>Lack of agreed technical standards</p>	<ul style="list-style-type: none"> • Continued dialogue to ensure these are agreed to.

Local Authorities

Respondents identified local authorities as playing a key role in the rollout of public charge points. Inaction by authorities was identified by many respondents as the single biggest barrier to rolling out charging infrastructure. Local authorities often play a key role in highway management and planning. When they actively engage in the rollout of charging infrastructure, they can play a crucial convening and partnering role, attracting funding from the central government to be used in partnership with private installers. This can benefit consumers not just with improved chargepoint coverage, but also through more competitive pricing.

Coventry City Council provides an example of what local authorities can achieve when they dedicate resources to installing EV charging infrastructure. The council has made effective use of available central government funding. It has successfully secured funding for on-street residential chargers in each financial year since 2018/19, with total to-date government grant funding for on-street residential charge points totalling £2.3 million - almost as much as has been secured by all London boroughs combined (£2.4 million).²³ This funding has delivered over 500 on-street charge points in the City, which have helped bring 45% of households that do not have off-street parking within 5 minutes' walk of a public chargepoint.²⁴ Since the charge points are supported by public funding, guarantees relating to pricing and consumer experience can be written into the contract by the local authority. In Coventry's case, a dedicated network, 'EO Charging' operates the network, and offers prices that are extremely competitive (at around 25-29p/kWh)²⁵ and offer significant savings when compared with standard domestic electricity rates, which typically hug the government's 34p/kWh price cap.²⁶

However, a lack of political will within some local authorities, combined with a lack of relevant technical expertise, can result in poor network growth in some areas. Many Local Authorities lack in-house expertise on EV charging, and struggle to engage with Distribution Network Operators (DNOs). These issues are likely to become less of a problem as uptake of electric vehicles increases and demand for charging coverage increases and as additional funding available from the central government becomes available to local authorities.

The Department for Transport is making £450m in capital funding available to local authorities for EV charging projects between 2022-2025. An additional £50m will support the deployment of staff to support this capital funding. The £450m capital funding represents a significant increase in the £11.7m of funding awarded to councils through the On-street Residential Chargepoint Scheme up to October 2022²⁷. This volume of money should vastly accelerate the coverage of off-street residential households if councils make good use of it between now and 2025.

²³ Oct 2022, DfT 'Electric Vehicle Charging Device Grant Scheme Statistics October 2022'

²⁴ Data obtained from Field Dynamics' National Map of EV Charge Point Coverage, December 2022.

²⁵ Correct at time of writing, December 2022.

²⁶ See, for example, Ofgem's Retail Market Indicators. This was correct at the time of writing in December 2022.

²⁷ Oct 2022, DfT 'Charging Device Grant Scheme Statistics'.

Changes to Regulation

Many respondents raised concerns about recent changes to regulation concerning public charging infrastructure. The Electric Vehicles (Smart Charging) Regulations 2021 came into effect in July 2022, and require all new domestic chargers to be smart capable.²⁸ The government is also planning new regulations to improve the consumer experience at public charge points.²⁹ These are likely to regulate payment systems and pricing transparency. Adapting with regulatory requirements may have slowed installations and delayed some plans. These should cease to be a problem over the coming years.

Electrical Connections

By far the most common practical obstacle raised by respondents were those surrounding connecting charge points to the electricity grid. Issues included securing planning consent, wayleave, the consent of the distribution network operator (DNO), as well as the cost of upgrades. One respondent told us that these issues can delay projects for between 6-12 months. We heard one case where a project had been delayed for 2 years due to issues related to securing an electrical connection. Broadly speaking, we can divide these issues into costs (i.e. the cost of upgrading electricity cabling), and land rights (including planning permission and wayleave).

The problems associated with costs revolve around the fact that at present, if a business requires more electricity than the local grid can supply, the DNO will charge them directly for the cost of the upgrade required. This creates the risk that the first few sites to seek a grid connection may be accommodated by the DNO, but the third or fourth may be faced with an enormous bill. This is a broader problem beyond EV charging infrastructure; it can also prevent the electrification of some industrial processes where the grid connections cannot accommodate additional demand for electricity. In general, the move to a decarbonised economy implies extra electricity demand, creating a general need to implement grid upgrades.

In May 2022, Ofgem announced the Access and Forward-Looking Charges Significant Code Review decision.³⁰ This decision changes the way that grid connections will be funded, removing the requirement for a new electricity demand project to contribute to wider network reinforcement. This decision, coming into force from April 2023, should significantly reduce a key barrier that currently holds back the installation of new public EV charge points.

²⁸ [The Electric Vehicles \(Smart Charging\) Regulations 2021 No. 1467](#)

²⁹ Mar 2022, DfT 'The consumer experience at public chargepoints'

³⁰ May 2022, Ofgem 'Access and Forward-Looking Charges Significant Code Review: Decision and Direction'

Land rights remain an issue. These range from generic difficulties obtaining planning consent for new infrastructure to the DNO being unable to obtain wayleave. In 2022, the government carried out a call for evidence on access rights for electricity network infrastructure.³¹ The government should build on responses and bring forward proposals with measures to make it easier to install electrical connection equipment across private land for the purposes of providing infrastructure.

Lack of User Demand

Another barrier raised by the vast majority of respondents was a lack of user demand for EV charging. This was also backed up with a number of respondents stating a lack of EV supply was harming the businesses' ability to grow. With only 500,000 fully electric cars on the road, most of which charge mostly at home, it is not surprising that the public charging infrastructure is seldom used. In both the interviews and the survey we heard that getting more EVs on British roads was essential to continuing to improve the infrastructure and ensuring the sector continues to grow.

We asked respondents about changes in utilisation rates at their charge points. Most reported that utilisation figures have gone up from the previous year. However, three businesses reported a 50% reduction in either destination charging or workplace/fleet charging. However, overall there was a tripling of utilisation with the largest jump being for transit and rapid charging which saw an average tripling of utilisation figures for those reporting.

We also heard that investment in EV infrastructure does not depend on the current use of the infrastructure, or current unmet need for EV charging. In the future, when the UK's 33 million cars are fully electric and charge points are regularly used, investment will likely be guided by driver behaviour. However, until electric cars become more ubiquitous, infrastructure is installed in anticipation of demand that does not currently exist.

The level of future demand will depend on the rate of future electric vehicle uptake. Government policy to support the rollout of electric vehicles is therefore very important for mobilising investment in new electric vehicle chargepoint infrastructure. The greater certainty about the level of EV uptake, the greater the certainty about the investments being made in charging infrastructure.

The UK is in the process of revising its policies to support EV uptake. Some fiscal incentives and grants are in the process of being ended,³² with most set to end by 2025, and the government is moving to regulate supply by introducing a zero emissions vehicle mandate (ZEV mandate).

³¹ Aug 2022, BEIS, [Land rights and consents for electricity network infrastructure: call for evidence](#)

³² June 2022, DfT ['Plug-in grant for cars to end as focus moves to improving electric vehicle charging'](#)

ZEV MANDATE EXPLAINED

The government is committed to implementing a 'Zero Emissions Vehicle Mandate',³³ known more commonly as a ZEV mandate. The ZEV mandate is a system of legally binding targets that requires car and van manufacturers to sell an increasing number of zero emissions cars and vans as a proportion of all the cars and vans they sell.

The scheme will be introduced using powers in the Climate Change Act 2008, which makes provision for the introduction of trading schemes for the purposes of directly or indirectly reducing emissions. The scheme will bear some similarity to other existing trading schemes, such as the Renewables Obligation or the UK's Emissions Trading Scheme, in that it will involve a legally binding target that can be met by through a system of tradable obligations as a result of achieving emissions reductions (in this case, selling zero emissions vehicles).³⁴

The government has published initial proposals for the design of the mandate, with a consultation process on these proposals taking place over summer 2022. The initial proposed targets are set as a percentage figure, and are due to begin in 2024 with a target of 22% of new car sales to be zero emissions and 8% of new van sales. That means that in 2024, 22% of all cars sold by any manufacturer must be zero emissions. Those that exceed this target and sell more zero emissions vehicles than necessary can sell their excess credits; those that underperform will need to purchase credits from a competitor or pay a 'buy-out' fee.

The scheme should guarantee that more and more EVs will hit British roads in the near future. This should help give both investors and businesses greater confidence in the level of demand for charging infrastructure, EV batteries, and electric cars themselves. However, there are a number of uncertainties surrounding the final implementation of the scheme which may risk undermining its original intended purpose. A second consultation on the draft regulations that will underpin the scheme were to be published by the government at the end of 2022, but have been delayed, leading to concern that the scheme may not begin in early 2024 as was originally planned.³⁵

There is also a risk that the final design of the scheme will be too flexible, allowing car manufacturers to delay complying with targets and therefore delay the number of EVs being produced and sold in the UK. Allowing flexibilities such as 'borrowing', which would allow manufacturers to borrow credits on future sales of their EVs, would mean manufacturers meet their targets without increasing the number of EVs supplied.

³³ April 2022, *Department for Transport 'Policy design features for the car and van zero emission vehicle mandate'*

³⁴ UKPGA 2008 c. 27, see part 3

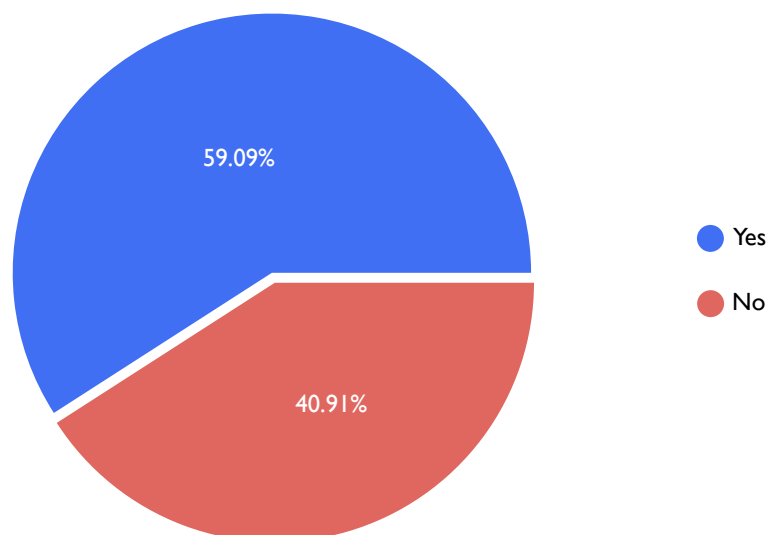
³⁵ See, for example: Dec 2022 *Transport & Environment 'How is combustion engine phase-out going in the UK?'*

The 2030 goal

The Committee on Climate Change estimates that by 2030, 20% to 30% of vehicles on the road will be electric. This is exponentially higher than the 2% figure for 2022. The government has set an aim of 300,000 public chargers by 2030, to support the increased number of EVs within the British car parc.³⁶ With the number of public chargers in Britain currently at 34,637, the infrastructure industry must add at least an extra 33,170 chargers each year in order to meet this target. To put this target in the context of current rates of growth, in October 2021 a total of 8,710 chargers were installed, increasing the size of the public charging network 34%.³⁷

Respondents were somewhat split in their views on whether the 300,000 target was a reasonable assessment of need, with 59% stating they agreed it was and 41% stating that they did not think the estimate was correct (see graph 3.1) Those who agreed with the target provided a number of reasons for why they believed it accurately reflected future need, but there was no clear consensus amongst respondents as to why it was correct. A number of respondents stated that there would be adequate demand for a network of such size and that this would mean the market would respond. Another respondent stated that it may be correct, but it would be the market that would make the final determination on exactly how many chargers were required by the 2030 date. Additionally, some respondents indicated the target was required to help quieten public anxiety around charging network growth.

Graph 3.1: Is 300,000 chargepoints by 2030 a reasonable assessment of need?



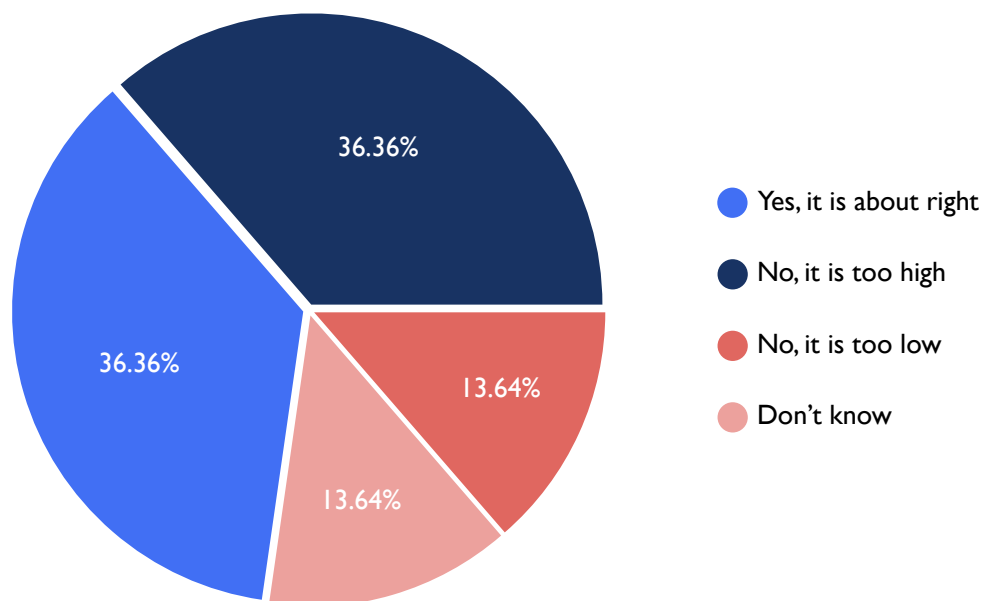
³⁶ Mar 2022 Gov, [Tenfold expansion in chargepoints by 2030 as government drives EV revolution](#)

³⁷ Oct 2022 Gov, [Electric vehicle charging device statistics: October 2022](#)

Those who did not agree with the 300,000 target also offered a range of views supporting their position. There was more of a consensus between those who opposed the target on the reasons for opposition than there was between those in agreement with the target. A number of respondents agreed that the number was too low and more chargers would be needed in order to support an effective transition. Another group of respondents stated that the number was too arbitrary, and that there needed to be a breakdown of charging speed in order to work out the number of chargers required in the country.

Further to this question, respondents were asked whether they thought the 300,000 target was realistic for the industry to achieve within the timescale outlined by the government. Again, there was a broad range of answers. 36% thought it was a realistic target, while a further 36% thought it was unrealistic. Only 14% of respondents thought it was too low, and the same again stated they did not know. Of those respondents who thought it was achievable, several stated that it was in line with predicted availability of power within the grid, and was therefore within the parameters of what industry could effectively deliver given current constraints. An equal number to those who thought it was achievable believed the target was simply too high to be practically achievable. The overwhelming majority within this segment of respondents stated that the barriers faced by the businesses in this sector would mean this aim was missed.

Chart 3.2: Is 300,000 a realistic target for the industry to meet?

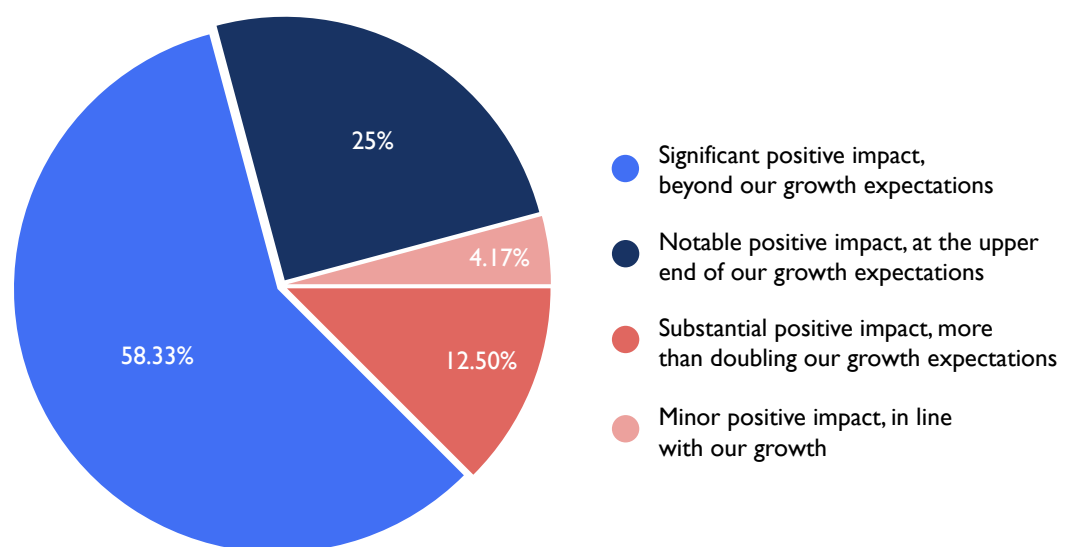


The key and obvious takeaway from the vastly differing views of the 2030 300,000 target is that there is no clear consensus on this target. The majority thought it was broadly correct, and achievable, but the reasoning that led to this conclusion varied greatly between respondents. The most cohesive consensus on the target was between those companies who believed the target was not achievable, with this segment of respondents all believing that there were too many barriers in place for the industry to be able to effectively meet the target by 2030.

Conclusion

The majority of businesses that participated in our research indicated very strongly that removing the barriers previously mentioned in this paper would have a significant positive impact on their growth expectations. A quarter of respondents stated they would see a notable positive impact at the upper end of growth expectations, and 71% of respondents stated it would improve their growth expectations beyond existing projections. Only 4% of respondents stated that they would not see any serious improvements in their growth expectations if the identified barriers were addressed. Given this, it is important that any plan to help enable the industry to grow beyond current expectations would adequately address and limit the negative impact of the barriers to growth that are currently in play.

Chart 3.3: Assessment of top 3 barriers being removed



Part 03

On the Road to 2030

Conclusion and recommendations

Recommendations

This report has sought to unlock insight into the views held by the UK's charging infrastructure industry, and identify how best to unlock the growth necessary for the industry to effectively support the UK's EV transition in the lead up to 2030. The recommendations made below reflect what needs to happen in order to make sure the UK continues to develop an effective infrastructure network, of both private and public chargers, capable of servicing the increasing number of electric cars on British roads.

01 ▶ Implement an industry leading ZEV mandate in order to ensure adequate supply of vehicles.

The government must speed up the process of implementing a ZEV Mandate in the UK which will help to secure supply chains for EVs. This will help to ensure the charging industry can still plan for future growth while it is slowing in the short term. An industry leading ZEV mandate will enshrine the 2030 phase-out of petrol and diesel vehicles into law and create a pathway to the date. It is important that the date for implementation (January 2024) is not pushed back significantly and no large concessions are given to manufacturers that risk the mandate becoming a tick boxing exercise.

02 ▶ Do not slow the uptake of EVs in order for infrastructure to 'catch-up'.

The UK must avoid a chicken and egg scenario and not risk the transition to zero emission vehicles by pausing uptake in order for infrastructure to catch up. The UK is on track to hit the 300,000 minimum set by the government according to New AutoMotive projections and the industry believes that if key barriers are removed their rate of installations will improve significantly. The infrastructure industry is largely being driven by the private sector and in order to continue to secure funding to carry on improving, the supply of vehicles must also continue to grow. This will ensure utilisation figures are high enough to enable growth in the public network, as well as ensuring there is adequate demand for home chargers.



03 ▶ Listen to industry voices and enable the removal of key barriers identified.

There are a number of potential barriers which are currently slowing down growth in the sector. The government should act with the industry to ensure that the industry can expand the network robustly. A key barrier to the length of securing and installing a site were grid problems such as wayleave, leasing issues, connection problems etc. It is important these, along with other key barriers identified, are removed. The government has taken positive steps towards this with the removal of X but this needs to be replicated across key barriers.

04 ▶ Maintain ease of accessing data

A snapshot of the state of the whole network was possible due to figures from the quarterly published data for the public network and the historical figures from the EVHS and WCS schemes. Without data on home and work networks an important part of the overall UK charging infrastructure will be lost. It is important that the government continues to track the number of private and semi-private chargers, this could be done by working with the industry to monitor and aggregate the data given to them.

05 ▶ Help the industry navigate the energy crisis

The recent announcement that the energy support for businesses will be reduced from April means infrastructure businesses may have to pass the increases in electricity prices onto the consumer. The government has stated that high energy-using sectors will get a larger discount. In order to help ensure that those relying on public infrastructure can access the savings that those with private charging can, it is important that the industry is allowed to access the larger discount.

Conclusions

The UK infrastructure industry is going through a pivotal moment, as it navigates a period of slower growth in the electric vehicle market as Britain progresses further toward the 2030 phase-out of petrol and diesel vehicles. It is now more important than ever that the views of industry stakeholders are listened to, especially on how to overcome barriers to growth. The barriers identified in this paper are causing significant issues within the industry. However, infrastructure providers have a strong understanding of how these barriers can be overcome, and the government must make sure that any attempts to ‘barrier bust’ takes these views into account in order to focus on a market first approach.

The government must implement strong legislation and create an ideal environment so that the industry is able to drive forward towards the target of 300,000 chargers by 2030 as a minimum. At the moment, the industry does not have a unified position on whether the aim is achievable or the correct amount. It will be important to track the industry in the coming years in order to make sure that an approach is being decided on by the market, if this does not happen further intervention may be necessary in order to guarantee the correct infrastructure mix.

The survey was a first attempt at mapping the infrastructure industry in the UK across all types of charging and it is important that further research is done on the industry and an attempt at tracking the industry as the transition to electric occurs will be important in making sure that barriers are being broken down in ways which benefit the industry. Another piece of further research which should be prioritised is one which accurately maps out the total number of those employed in the industry and the total amount it contributes to the economy. This will help to create an understanding of just how much the industry contributes to the economy and what its growth prospects are likely to be.

Contact

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