

# Electric Vehicles: Community Insights Report 2022

dg:cities

## Introduction

### PUBLIC EV UPTAKE TRENDS

The purpose of our study was to uncover current trends in electric vehicle (EV) uptake and more importantly, to understand the drivers behind these trends. At a national level, the government has set out its aims in the *Net Zero Strategy: Build Back Greener*, to decarbonise transport and achieve net zero by 2050<sup>1</sup>. As part of these plans, no new petrol or diesel cars and vans will be sold in the UK after 2030, in a move intended to drive the transition to alternative technologies. The technology that the majority of people will likely transition to is battery electric vehicles.

The UK government has set aspirational targets that will require a significant shift in purchasing behaviour over the coming decade. This has been made possible through considerable innovations in technology, in particular battery capacity, and EV charging technology, in order to reduce charge time and range anxiety. As a result, the market is growing: in the UK alone, EV sales have increased 160% over 2 years<sup>2</sup> and are predicted to continue to grow in this way.

There is, however, a significant challenge in supporting a more diverse selection of consumers in the switch to EVs, so if we are to better understand and encourage the transition to electric vehicles, it is important to understand the drivers and barriers of switching. This survey explores public attitudes and perceptions of EVs, and highlights opportunities for improving uptake for policy makers, Industry and the public sector.

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<sup>1</sup> <https://www.gov.uk/government/publications/net-zero-strategy>

<sup>2</sup> <https://www.zap-map.com/ev-market-statistics/>

## DG CITIES CASE STUDY: RURAL ELECTRIC MOBILITY ENABLER (REME)

The transition to EVs will not be evenly distributed across different areas. A great deal of attention and investment has been placed on urban centres, where market readiness and interest in EVs is high, but an area of growing importance to industry and policy makers is that of rural communities across the UK.

In 2021, DG Cities delivered the REME project alongside EDF, Field Dynamics, Bonnet and Devon County Council. Funded by Innovate UK, REME set out to explore rural electric vehicle charging in Devon, with the intention of learning about rural deployment in other parts of the country. Our work aimed to understand barriers to EV uptake in these areas and assess seasonal fluctuations in demand. From this research, we looked to scope potential technology solutions.

Working with Field Dynamics, the project created a replicable mapping tool which can give an overview of a number of variables, including grid capacity, connectivity, and kerbside and off-road capacity for infrastructure.

With project partner, EDF, the team conducted a survey of 1,000 targeted rural respondents. The survey was conducted to understand more about both rural EV and non-EV owners. This understanding of people's attitudes and barriers (actual and perceived) for those who do and don't own electric vehicles is vital to informing the strategy for growth in electric vehicles across the country.



## Methodology

An EV survey was distributed online to UK residents during January and February 2022. It was free and accessible via any digital device, promoted across social media and to the DG Research Community.

The survey was split into four sections:

- Likelihood of transitioning to an electric vehicle
- Barriers to uptake
- Charge time expectations
- EV charging infrastructure: who should be responsible?

In total, 415 good quality responses were analysed.

## Findings

**A fifth (19%) of respondents are very likely to purchase an EV in the coming 12 months:** although 50% of respondents are not likely to purchase an EV in the coming 12 months, we found that almost a fifth (19%) state that they “very likely” to purchase an EV, whilst just over 1 in 10 (12%) think that it is likely.

**The major barriers to EV adoption are cost, perceived lack of charging infrastructure, and range anxiety:** cost was cited by over a quarter (27%) of respondents as the biggest inhibitor to purchasing an EV, while issues relating to range were also noted, including lack of charging infrastructure (24%) and a perceived lack of range in current EV models (22%).

**Expectations for EV charge times away from home differ by sex:** the average time expected to charge an EV from empty to full charge at home was around 5 hours (300 minutes) for both men and women. However, when asked about charge times on public chargepoints away from home, women were significantly more likely to expect longer charge times (169 minutes) compared to men (93 minutes).

**Responsibility for installing chargers is split across groups:** the public believes that energy companies should be responsible for installing chargepoints (60%) whilst local authorities were also cited (54%). Few believed that private vehicle owners should carry the responsibility.

## ANALYSIS

In the next section, we explore research findings in the following themes:

- Likelihood of transitioning to an electric vehicle
- Barriers to uptake
- Charge time expectations
- EV charging infrastructure: who should be responsible?

### LIKELIHOOD OF TRANSITIONING TO EV

A good starting point is to understand what people's current expectations are regarding transitioning to an electric vehicle.

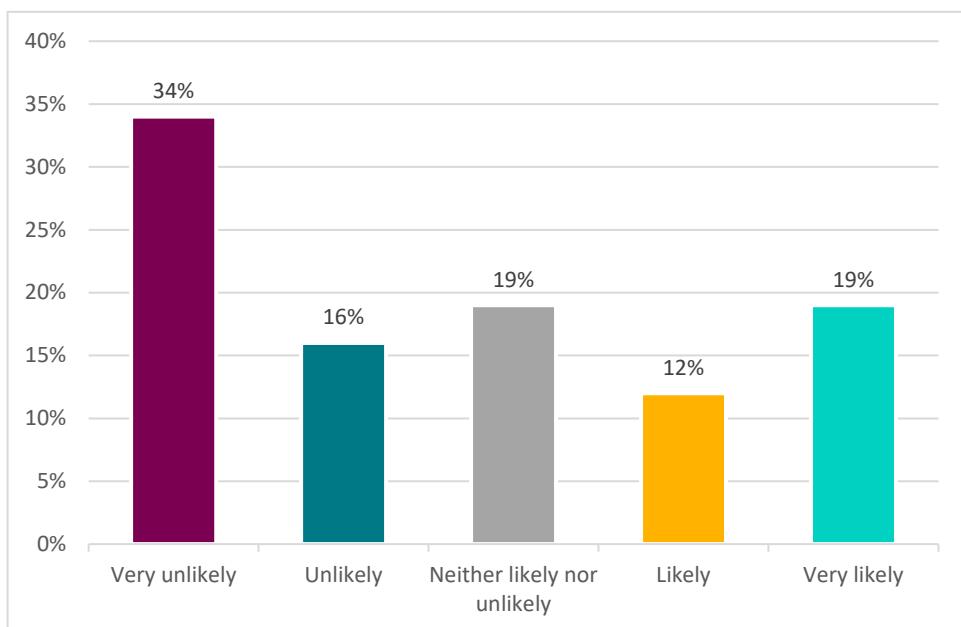
Interestingly, quite a large proportion (31%) of respondents consider it *likely* or *very likely* to switch to an EV over the next 12 months. This is quite promising when you consider the 2030 ban on the sale of new petrol or diesel cars and vans. As we move closer to this date, it is likely that more people will consider switching to an electric vehicle in the coming years.

It is important to note that the likelihood for people to transition to EV will vary across different regions and areas. The REME study, which focused on rural areas, found that 10% of rural respondents without an EV stated that they are 'extremely likely' to purchase an electric vehicle in the next few years. 19% of respondents to the DG Cities Research Community survey stated that they are "very likely" to purchase an EV. The research community sample is a mix of both urban and rural residents, and highlights a reduced likelihood of people switching to an EV in rural areas.

### EV MARKET

In May 2022, 12.4% of new vehicles purchased were electric, up from less than 10% in 2021. This is, however, much lower than the values indicated by our survey. We believe this is a result of three trends; an expected continued growth in EV purchases over the coming year, usage of EVs, not only as a traditional private vehicle but also as a leasing option, and a behavioural willingness/aspiration. There are also long waiting times for many popular EV models, so a supply shortage might also be responsible for lower new EV registrations compared to popular demand.

Figure 1: Likelihood of switching to an EV in the next 12 months



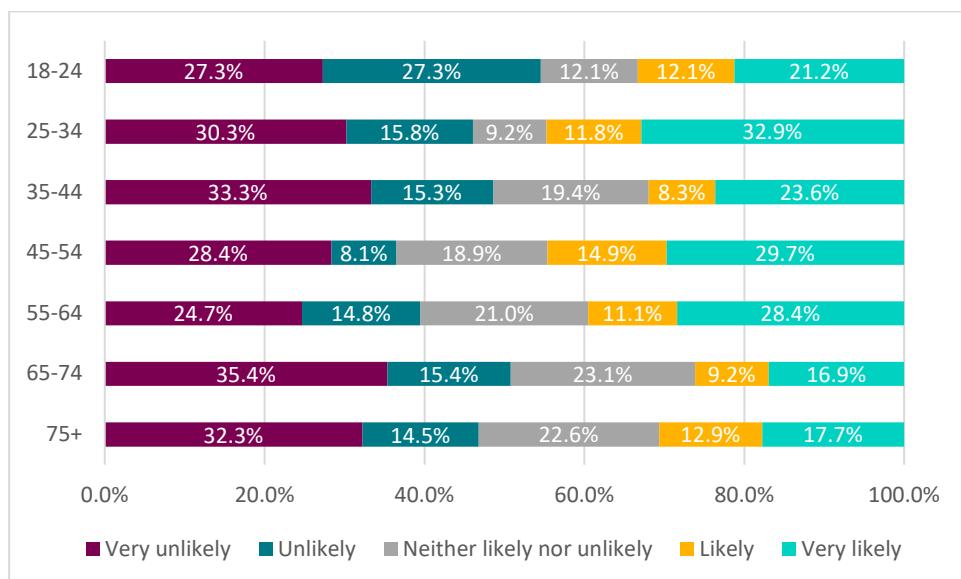
Base = 415 (weighted); EV Owners excluded; "I don't know" excluded.

Below we highlight three potential factors that influence interest in switching to an EV:

#### FACTOR 1: INDIVIDUAL AGE

Our data includes several interesting trends worth exploring. Age, for instance, does not seem to have a big impact on people's attitude towards their eagerness to use EVs. The likelihood of people switching has been very consistent across all age groups.

Figure 2: Likelihood of switching to EVs by age



#### FACTOR 2: CHARGEPOINT AVAILABILITY

Availability of EV charging points is thought to be a key indicator of EV uptake. Whilst this is definitely the case on the macro level, the impact might be less than you would think on a personal level. A related factor

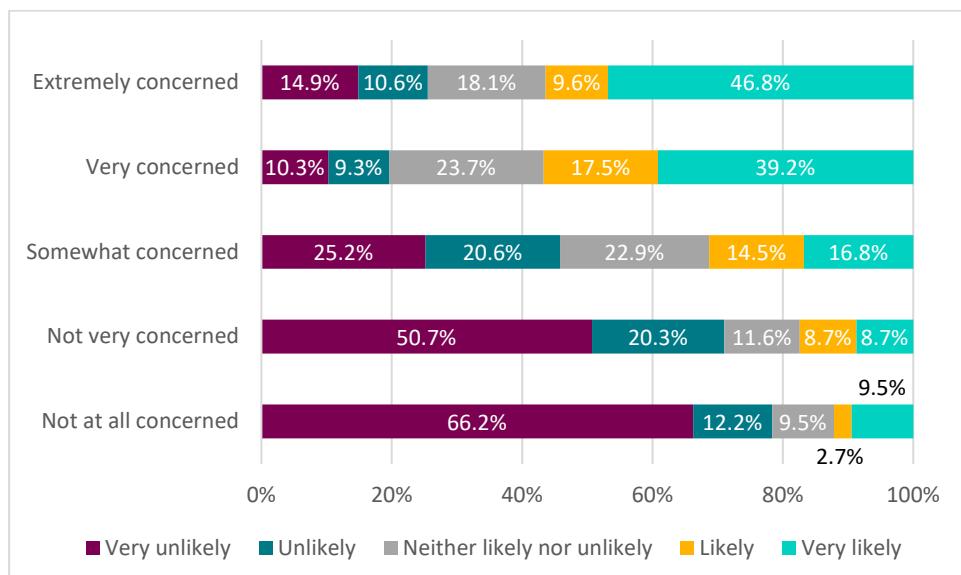
for those who were considering a switch was availability of new smart chargers in their local area, but this was not a driving factor. Many respondents who did say that EV charge-points have become more available near them still think it *unlikely* or *very unlikely* they would switch to EVs. It is also worth noting that 32% of households outside of London do not have access to off-street parking at their home<sup>3</sup>. These households would not be able to install a home charger to charge their vehicle at home, meaning that at least 7.8 million households would ultimately be reliant on public charging. This emphasises the need for accessible public charging infrastructure.

#### FACTOR 3: CONCERN OVER CLIMATE CHANGE

A much clearer driver for the EV switch is climate concern. A very strong correlation can be seen amongst respondents who are concerned about climate change and those intending to switch to EVs in the coming year. Meanwhile, people who are not concerned are a lot less likely to switch to EVs.

This finding can suggest that while installing EV charging points is definitely a useful and important action for government to do, further education and awareness raising of the impacts of climate change will be necessary to encourage a people-led EV transition.

*Figure 3: Likelihood of switching to an EV versus concern over climate change*



Base = 465 (weighted); EV Owners excluded; "I don't know" excluded.

<sup>3</sup> [http://www.field-dynamics.co.uk/wp-content/uploads/2020/09/On-Street-Households\\_The-next-EV-Challenge-and-Opportunity-1.pdf](http://www.field-dynamics.co.uk/wp-content/uploads/2020/09/On-Street-Households_The-next-EV-Challenge-and-Opportunity-1.pdf)

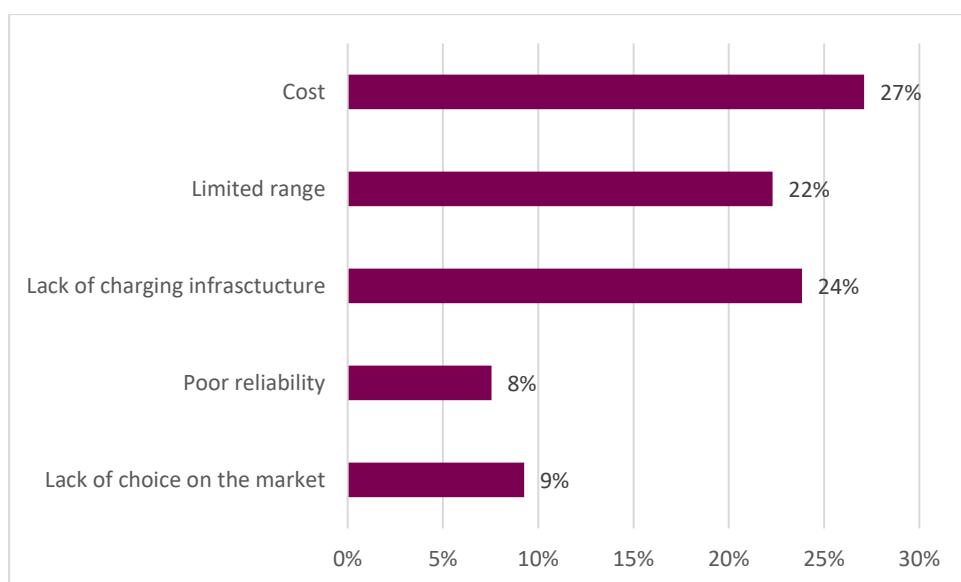
## BARRIERS TO UPTAKE

In the second part of our analysis, we look at the barriers to EV uptake. When looking at perceived barriers, the trident of cost, range and limited infrastructure frequently come up. These are commonly cited barriers of EVs<sup>4</sup> and were the most often mentioned in this study by individuals who are not looking to switch to EVs.

As EV purchase costs continue to decrease, it can be expected that vehicles purchased in the second half of the decade will be significantly cheaper. Analysis from Bloomberg New Energy Finance (BNEF) identifies that electric cars and vans should be cheaper to produce than ICE vehicles by 2027, with some vehicle segments achieving price parity from 2026<sup>5</sup>. Price parity refers to the point in time where an automaker can build and sell an electric vehicle with the same margin as a comparable combustion vehicle, assuming no subsidies are available. As we move towards price parity for electric vehicles, we could expect to see an increase in individuals moving from ICE vehicles to EVs.

Perceived barriers among the public differ, however - only a quarter of responses refer to the above barriers. Instead, a majority of respondents don't recognise any barriers to uptake of EVs.

*Figure 4: Perceived barriers to uptake*



Base N (weighted): 583

Whilst cost was the most often cited barrier, when asked to prioritise solutions that would improve EV uptake, respondents clearly focused on the ease of making trips (e.g., range, charging speed, and charging

<sup>4</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/914111/driving-and-accelerating-the-adoption-of-electric-vehicles-in-the-uk.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/914111/driving-and-accelerating-the-adoption-of-electric-vehicles-in-the-uk.pdf)

<sup>5</sup> <https://www.transportenvironment.org/discover/hitting-the-ev-inflection-point/>

locations). These solutions highlight a clear need among the public to maintain a similar journey comfort that is possible with ICE vehicles.

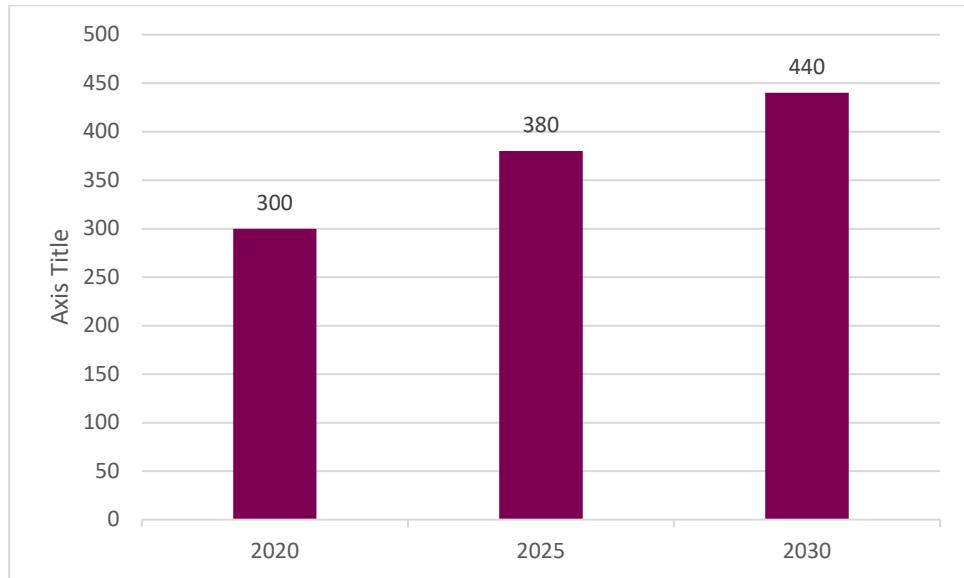
*Table 1: Solutions to improve EV uptake, ranked mean scores (1 = most important, 6 = least important)*

|                            | Solution  | Mean score |
|----------------------------|---|------------|
| <b>Most important (1)</b>  | Improving EV range                              | 2.44       |
|                            | Increasing charge speed                         | 3.03       |
|                            | Increasing number of charge locations           | 3.07       |
|                            | Making more grants available                    | 3.63       |
|                            | Increasing vehicle choice                       | 3.98       |
| <b>Least important (6)</b> | Offering membership to multiple EV ChargePoints | 4.85       |

Base N(weighted) = 583

Range is clearly an important factor to consumers. Range is expected to increase over time as battery technology improves. By 2030, it is predicted that the average range of electric vehicles will be 440 kilometres. This potential range increase will be a comfort to those experiencing range anxiety. As we begin to see electric vehicles draw closer to ranges similar to ICE vehicles, we should expect to see rising numbers of electric vehicle uptake.

*Figure 5: Projected average range of electric vehicles between 2020 and 2030. Source: Statista, 2022.*



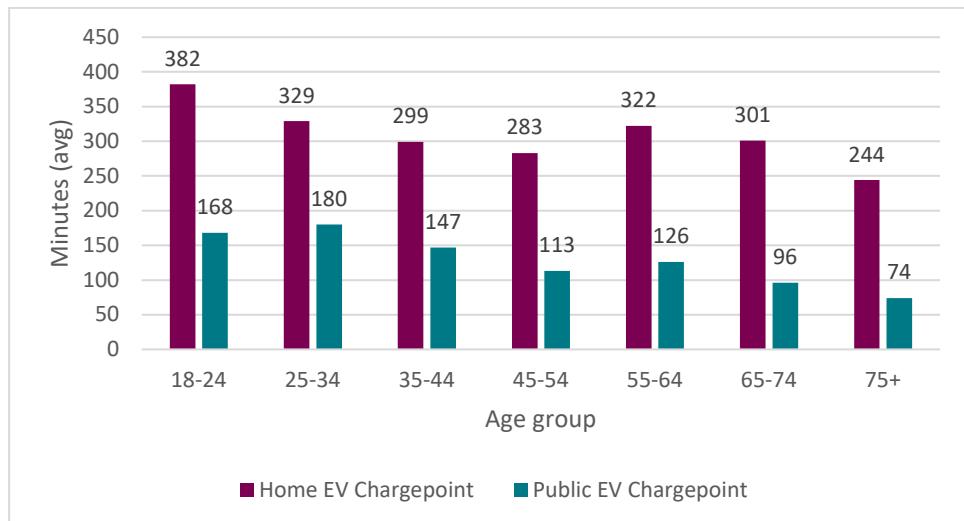
## CHARGE TIME EXPECTATIONS

The requirement to charge an EV is a clear difference, in behaviour terms, to the process of refuelling current ICE vehicles. Therefore, it is important to understand attitudes and perceptions towards charge time among consumers.

Our data highlights a potential relationship between charge time expectations and age: older cohorts expect faster charge times. For home charging, the expectation ranges between four and six hours, and for public charging it ranges between one and three hours. These figures are fairly reasonable and similar to what electric vehicle charging points can achieve today. Home chargers can typically charge at 7kW, meaning that smaller vehicles can receive a full charge within approximately six hours. A Tesla Model X with a larger battery requires up to 10 hours charging time, though its range is almost 600 KMs.

Public electric vehicle chargers can also meet the one-to-three-hour charge time, but time to charge is related to the type of charge point being used. For example, a lamp column charger would typically charge at similar rates to a home charger, whilst some rapid charging hubs can fully charge a vehicle within 30 minutes. Modern 50kW rapid chargers, which are increasingly available at key destinations such as shopping outlets, can fully charge a vehicle within 60 to 90 minutes.

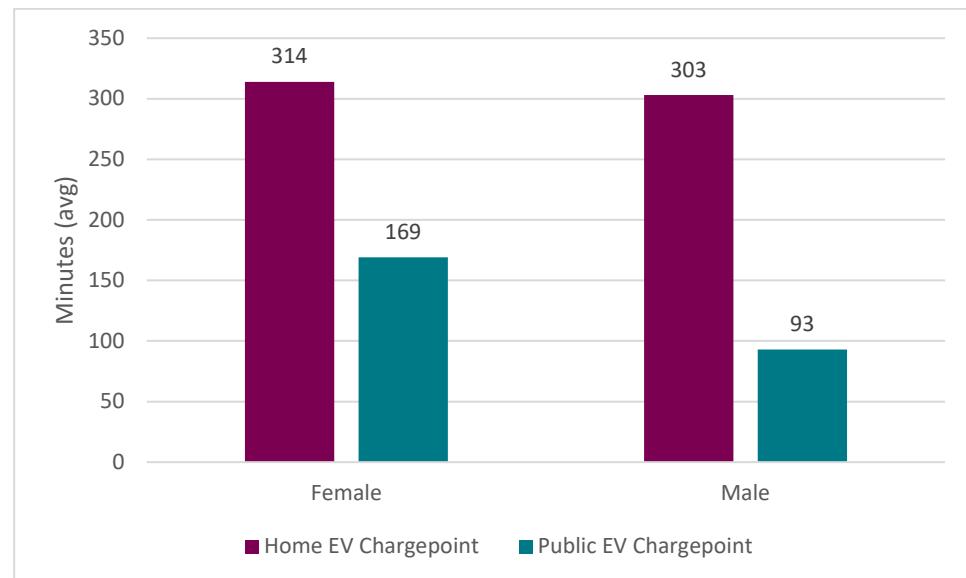
*Figure 6: Expected EV charge times from empty to full charge, by age group*



Base: Home EV Chargepoint, N(weighted) = 543; Public EV Chargepoint, N(weighted) = 541

In terms of male and female requirements, we can observe that while both expect a similar level of home charging (~5 hours on average), men expect full-charge to take over an hour at public charge points.

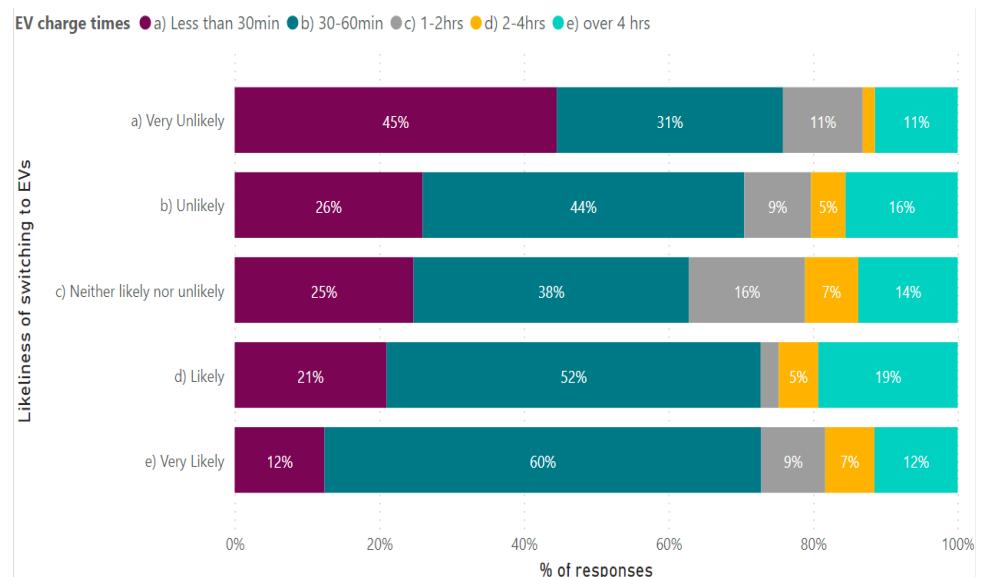
Figure 7: Expected EV charge times from empty to full charge, by sex



Base: Home EV Chargepoint, N(weighted) = 543; Public EV Chargepoint, N(weighted) = 541

Finally, we can look at the expectations of individuals who are likely or unlikely to switch to EVs. There is a definite correlation between people wanting below 30-minute charging times at a public charge point and considering it unlikely to change to EVs. However, it's important to note that people across the range predominantly expect a charging time below one hour at an EV charging station.

Figure 8: Expected charging times vs likeliness of switching to an EV



Base N(weighted) = 433

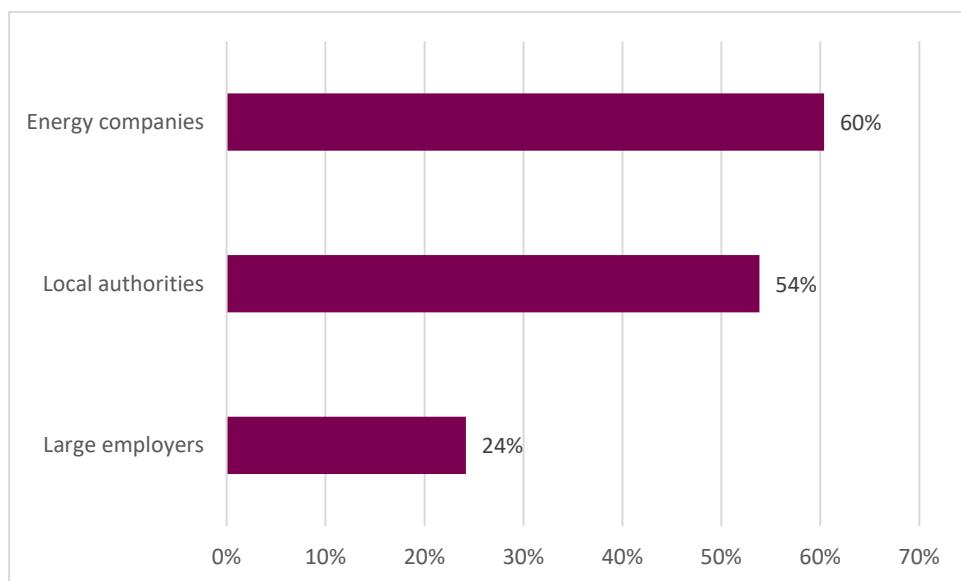
## EV CHARGING INFRASTRUCTURE: WHO SHOULD BE RESPONSIBLE?

Charge point access and availability is also a clear factor influencing attitudes towards EVs. Approximately 50% of respondents reported an increase in number of charge points in their local neighbourhoods. Two thirds of the people we surveyed indicated that there are charging points within a 15-minute walk of their homes.

When asked about who is responsible to install a charging network, the responses included both energy companies and local authorities. Whilst local authorities led the way in many instances with commissioning EV charging points over the previous five years, the expectation for future deployments is that private companies, often energy companies, will lead on scaling the network across the country. This approach would allow local authorities to encourage the private sector to roll out electric vehicle infrastructure, while filling in the gaps using their own resources. This approach will have the benefits of drawing on private capital and resources, but also ensuring there is an equitable EV charging point distribution.

The survey respondents did allocate a level of responsibility to large employers, who would have the option of enabling workplace charging, but most think it will not be a major solution.

*Figure 9: Who should be responsible for installing EV charging infrastructure?*

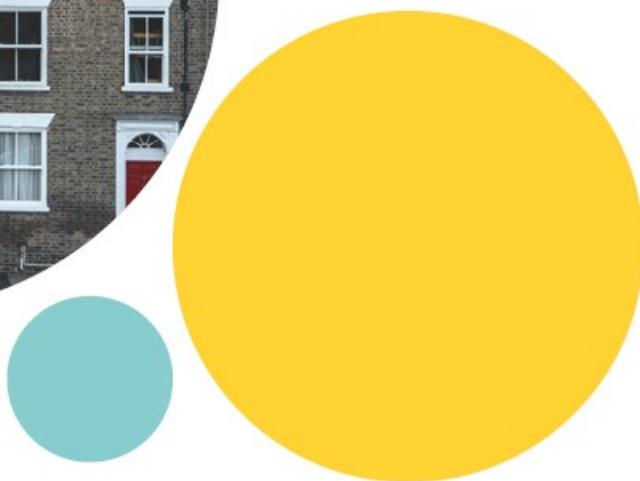
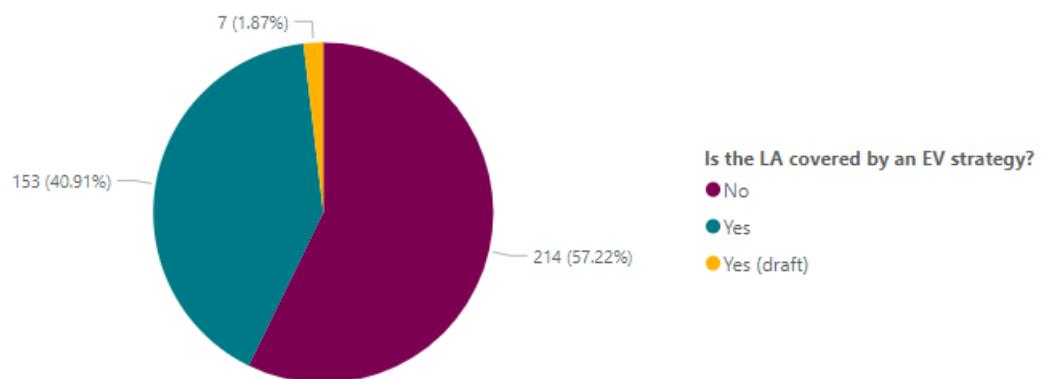


## LOCAL AUTHORITIES

Local authorities play a crucial role in enabling future EV charging infrastructure. Clear planning and development regulations will allow charging infrastructure to be distributed equitably with minimal adverse impacts on communities. If local authorities fail to act with suitable policy, it could lead to inadequate public charging infrastructure alongside inappropriate planning decisions around charge points.

The figure below shows the number and proportion of UK local authorities covered by one or more EV strategies at either a local, county, or regional combined scale (e.g., Black Country Transport Ultra-Low Emission Strategy). As of the end of March 2022, only 40.91% of UK local authorities are covered by an adopted EV strategy at either local, county, or regional level. Less than 2% of UK local authorities have an EV strategy currently in draft. The majority (57.22%) of UK local authorities are not covered by an EV strategy at either local, county, or regional level.

*Figure 10: Proportion of local authorities covered by an EV strategy.*



The figure below shows the number of public charging devices by local authority and their electric vehicle strategy status. There is a slight positive trend where local authorities with existing strategies in place tend to have a higher number of charge points installed.

*Figure 11: All public charging devices (Jan 22) by local authority and EV strategy status*

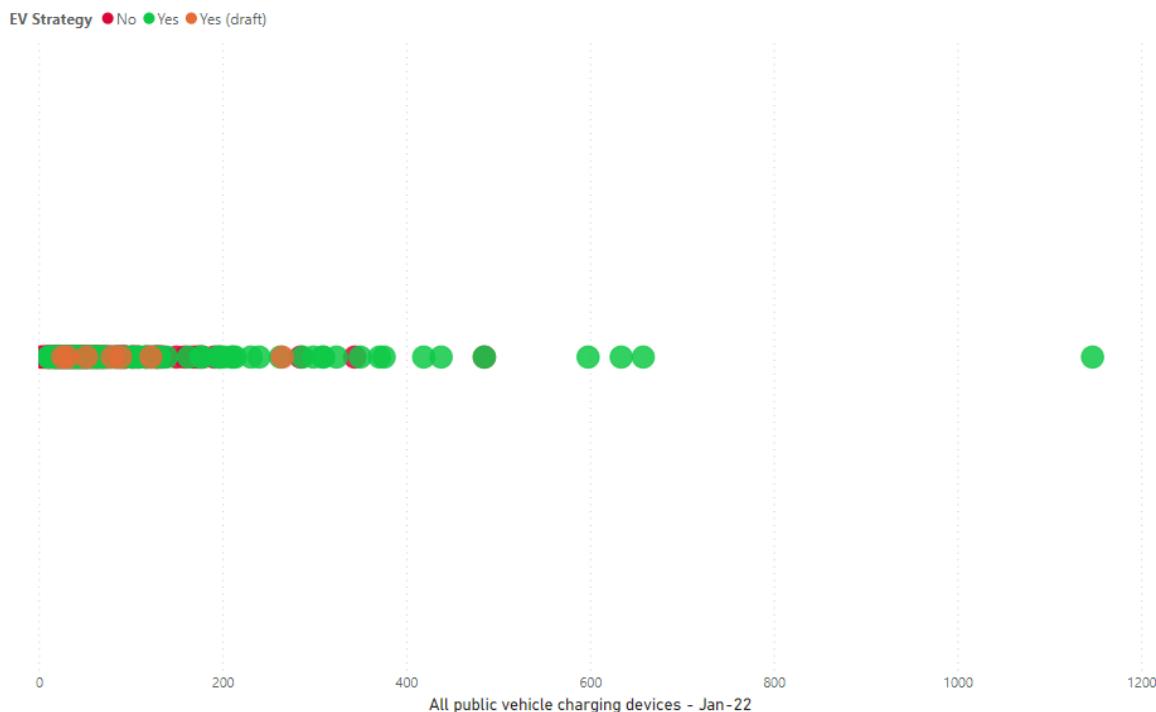


Figure 11 shows the relationship between the percentage of BEVs as a proportion of the total vehicle fleet, and public electric vehicle charging point availability per 100,000 people for local authorities across all regions (excluding London). Figure 12 overleaf also highlights whether a local authority is covered by an EV strategy and shows whether residents of local authorities with a higher proportion of battery electric vehicles (BEVs) also have greater access to public EV charging points

The data highlights that there is only a small positive trend between BEVs as a proportion of the total vehicle fleet and public electric vehicle charging point availability when viewed across all UK regions (excluding London). When looking at the data more closely, several local authorities with higher proportions of BEVs as a percentage of total vehicles fall within the lowest quantile of public vehicle charging points per 100,000 people (0 to <50). This suggests that the growing vehicle share of BEVs across some local authorities is not having a material effect on the availability of public EV charging points.

*Figure 12: Relationship between BEV percentage, public electric vehicle charging point and availability per 100,000 people, and EV strategies by region (excluding London)*

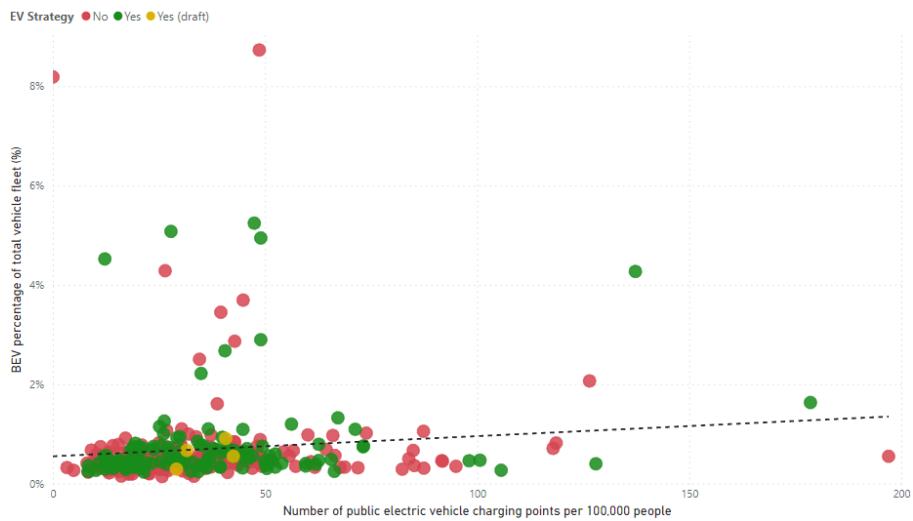
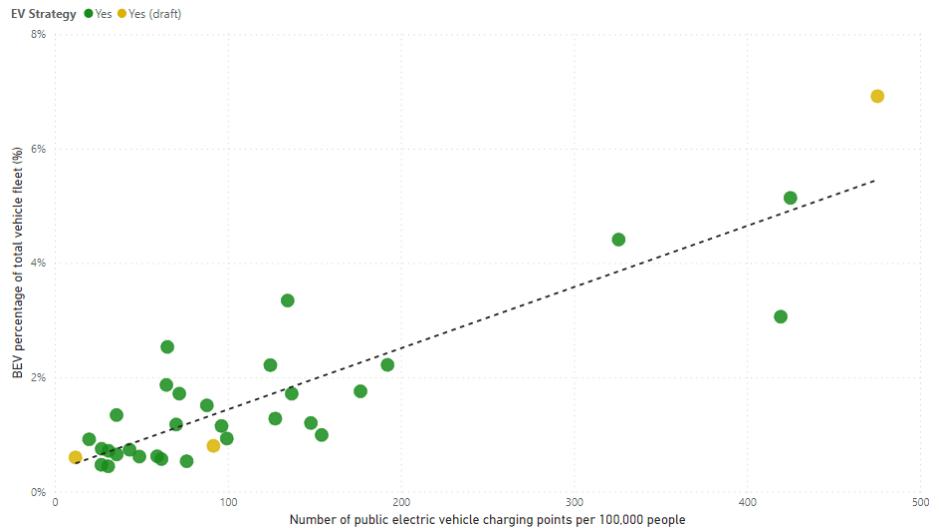


Figure 13 shows the results of the previous analysis in Figure 12 presented for all London boroughs. Across London, there is a clear positive correlation between BEVs, as a proportion of the total vehicle fleet, and public electric vehicle charging point availability, with no notable outliers in the data. This suggests that the growing vehicle share of BEVs across London boroughs is being translated into an increased availability of public EV charging points.

*Figure 13: Relationship between BEV percentage of total vehicle fleet, public electric vehicle charging point availability per 100,000 people, and ev strategies for all London boroughs*



# Discussion

We believe that these findings give an indication that most people are not necessarily far away from transitioning to EVs.

- A large proportion of the public requires further engagement through action and demonstration.
- Ideology will help to convert many, but not all drivers.
- Subtle differences in response between men and women might indicate that women may be easier to convince.

Our data shows that individuals aren't necessarily too far from the realities from EV charging, but there is a need for extra support and reassurance to enable the transition. There are several policy and practice interventions which can be put in place. For example, local government could develop communication campaigns which provide individuals reliable, accurate and informed information regarding EVs and charging infrastructure.

Engagement with businesses, residents and specific user groups could also be undertaken at scale. Local authorities are an important actor for supporting their communities to transition, and could therefore support adoption by various means, including facilitating demonstration events to familiarise individuals with electric vehicles and charging infrastructure, hosting education and information sharing seminars and workshops with key groups, and more actively measuring and understanding the attitudes and perceptions of local residents towards EVs. At this stage, many people require action and demonstration to be convinced to make the switch to electric.

BEVs are at the beginning of their adoption curve. Currently, we are seeing early adopters make the transition. These adopters often have easier access to charging stations (at home or at work) and tend to have a good knowledge regarding charging types, locations and prices.

As technology and infrastructure develops, EVs will become more mainstream. To make the switch, these people will require a wider range of makes and models, along with a smaller gap between the price of ICE vehicles and their EV alternatives. A risk, however, is that mainstream uptake of electric vehicles will be delayed if there is not sufficient distribution of accessible charging infrastructure – and as we are drawing closer to the 2030 ban on the sale of new petrol or diesel cars and vans, it's essential that all actors play their role in supporting the transition.



Despite the fact that education and engagement are important, it will not solve this challenge alone. Our research highlights that the cost, reduced range and lack of charging infrastructure are still major barriers, which delay the uptake of electric vehicles. Without improvement in these areas, it will be difficult to encourage the mainstream use of EVs. As EV vehicle costs continue to decrease, it can be expected that vehicles purchased in the second half of the decade will be significantly cheaper and closer to price parity. We hope to see similar progression with electric vehicle range too – by 2030, it is predicted that the average range of electric vehicles will be 440 kilometres. This will ease range anxiety, especially as they draw closer to ranges similar of ICE vehicles. The research findings did identify a general improvement in the number of chargers present, however there is a long way to go to ensure that we reach and maintain an adequate distribution of charging infrastructure. It is important that the need for charge points is continuously monitored and that infrastructure is deployed ahead of demand. Both local authorities and private suppliers should coordinate their investment and activity to meet demand.

As soon as we start to see progress in these areas, it is likely that more individuals will consider transitioning and we will witness the mainstream uptake of electric vehicles. The remaining years of this decade are going to be extremely significant and will play a huge role in achieving major adoption of EVs.

## RECOMMENDATIONS

There are several key takeaways from this study and recommendations that we make to local authorities and policy makers with regards to EV adoption:

**Recommendation 1: Develop, follow and monitor an electric vehicle strategy to encourage electric vehicle uptake**

This will support and encourage focused activity to enable electric vehicle uptake. A strategy will help councils establish their role in the uptake of electric vehicles and keep on track.

**Recommendation 2: Examine and evaluate existing policies and develop new policies to support the uptake of electric vehicles**

This will ensure that all existing and new policies are up to date and support the uptake of electric vehicles in the most effective way possible.

**Recommendation 3: Focus on engagement and education to encourage a people-led transition**

This will help councils and policy-makers understand and measure the attitudes and perceptions of local residents towards electric vehicles. Councils would then be able to develop targeted approaches to encourage the transition.

**Recommendation 4: Coordinate the deployment and distribution of charging infrastructure with engagement**

This will help ensure the equitable and justified distribution of charging infrastructure that is aligned with the needs of the public. This will support and encourage the uptake of electric vehicles, as charging infrastructure will be more accessible.



# Conclusion

Despite the fact that individuals are becoming more familiar with the realities of electric vehicle charging and moving closer towards making the transition, there is still lots more work to be done. A relatively large proportion (31%) of respondents consider it likely or very likely to switch to an electric vehicle over the next 12 months. This highlights that the work done to date has been effective in encouraging individuals, especially early adopters, in transitioning to an electric vehicle. However, 50% of respondents consider it unlikely or very unlikely that they will make the switch within the next 12 months. To encourage these individuals, we need to address the barriers that are preventing this mainstream uptake of EVs.

It is still so important to maintain the acceleration within the EV space if we want to keep seeing progress in the uptake of electric vehicles. The 2030 ban is drawing closer and it's becoming more important than ever to all do our part to enable a successful transition. It's clear that the transition to EVs is underway, our research shows that it can be further accelerated through deep engagement with the public, and a focus on strategies for delivery.



# About the authors

## DG CITIES

DG Cities is an urban innovation consultancy, specialising in helping clients harness the power of technology and data to transform the places we live and work.



**Ed Houghton, Head of Research and Service Design, DG Cities**

Ed is a thought leader in systems-thinking, system resilience, and AI in different contexts. He is a mixed-methods researcher who specialises in evidence-based policy and practice development.



**Balazs Csuvár, Head of Delivery, DG Cities**

Balazs leads the delivery of our innovation projects, solving challenges through the integration of new technologies and holistic thinking. His approach is founded in strategy consultancy with technical expertise in the EV, CAV and smart cities sectors.



**Ashleigh Burton, Electric Vehicle Infrastructure Specialist at DG Cities**

Ash brings a background in EV infrastructure and electrification, and has worked across public and private sectors. Ash contributes her expertise to a range of innovation and electrification projects, including rural electric mobility growth, fleet electrification and improving fleet charging solutions.

*To learn more about our cold mapping tool, designed to help local authorities identify areas where EV infrastructure is most needed, [watch our short film](#). If you would like to find out more about our projects, read our [blog](#), follow us on [Twitter](#), [LinkedIn](#) or [get in touch](#).*

The background features a large teal circle containing the white text "dg:cities". To the left of the teal circle, there is a yellow shape resembling a stylized 'd' or a mountain range, and a smaller yellow circle below it.

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