

Understanding electric  
vehicles – research findings

TfL number: 14234

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V3.0





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# Objectives and method

# Objectives

## Business objective

- To support the uptake of EVs to replace conventionally-fuelled cars. Using customer research, TfL aims to provide strategic direction and knowledge to support charge point network operators, helping to ensure the infrastructure is in the right place and offers the right service for customers

## Research objectives

- The research sought to understand:
  - How EVs are currently used and for what types of journey
  - The current charging habits of EV users
  - The purchase process of buying an EV including motivations and concerns
  - Customers' perceptions of and priorities for the services offered by a charging network in London

# Method

A total of 373 online interviews were completed with EV users in March and April 2015:

## ULED customers

- 189 interviews with EV users who have signed up for the Ultra Low Emission Discount (ULED)

## Online panellists

- 104 interviews with members of one of Future Thinking's preferred online panel providers

## Open link

- 53 interviews with EV users responding to an online link posted on various websites

## Postcards

- 414 postcards were placed on electric vehicles at public charge points in London with a link to the online survey, to which there were 27 responses

- Throughout this report we refer to 'EV users' by which we mean users of electric or plug-in hybrid vehicles
- 'Public charge points users' are those ever use public charge points in London (62% of total sample)
- 'Personal EV users' are those who use an EV that was purchased / leased by someone in their household (80% of total sample)

The image features a solid teal background. At the top, there are white geometric shapes: a large arrow pointing right on the left side, and a diamond shape on the right side. The text "Key findings and recommendations" is centered in the lower half of the image in a white, sans-serif font.

Key findings and recommendations

# Key findings

## Perceptions of and priorities for the services offered by the charging network in London

- Largely negative current perceptions indicate a clear opportunity to improve the user experience by expanding and improving the network
- Proximity to their final destination is key for public charge point users – most would be likely to walk up to 10 minutes to their destination
- There is no clear preference for potential payment options

## How electric vehicles are currently charged

- EV users tend to charge at home, mainly with a charge point they had specially installed – three in five use public charge points
- Two thirds plug in at least once a day
- Digital sources are key to helping users find available public charge points – four in five use websites or apps to do so

## The electric vehicle purchase process

- Environmental and financial benefits are the key motivations behind buying an EV
- The main concerns are limited mileage range, poor provision of public charge points and the number of public points out of service
- Issues such as range anxiety that were a concern during the purchase process remain a concern to many EV users

## How electric vehicles are currently used

- The majority have access to a personal EV and most are the sole or main user in their household
- Two thirds have been driving an EV in London less than a year
- EVs are mainly used for leisure trips although commuting is the type of journey made most often, on weekdays as would be expected due to the nature of this travel

# Recommendations for the public charge point network in London

## Increase serviceability

- Users are currently concerned about the lack of working public charge points, indicating scope to improve this perception by upgrading and improving the reliability of the network. This should also help to allay concerns about public charge points expressed during the purchase process

## Expand the network

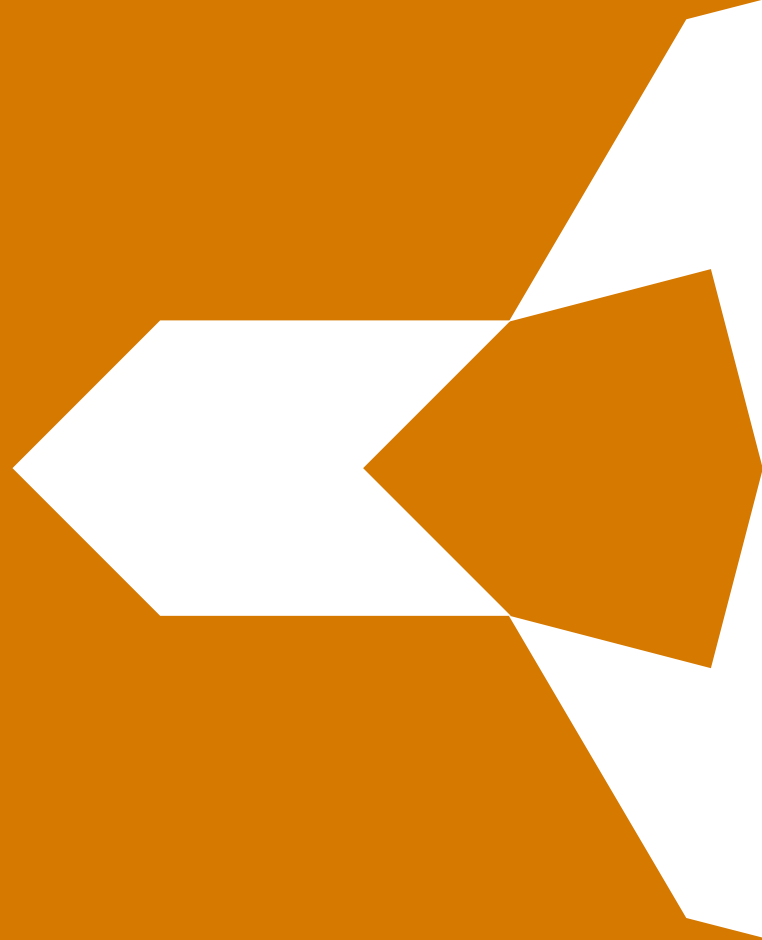
- Proximity of public charge points to a user's final destination is very important, therefore plans to significantly expand the existing network should help them to locate available points near to their destination more easily

## Provide clearer instructions

- Public charge points are not felt to be particularly easy to use, so consider providing step-by-step instructions to help users, similar to those available at Cycle Hire docking stations



# Perceptions of public charge points

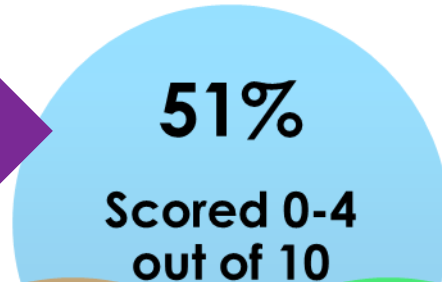




# Current perceptions of public charge points in London are largely negative

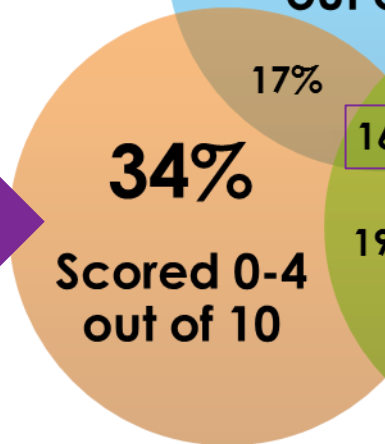
One in six (16%) are very dissatisfied with public charge points, find it difficult to locate available (and working) points and find them difficult to use

- Satisfaction with public charge points
  - Mean score of 3.8 out of 10

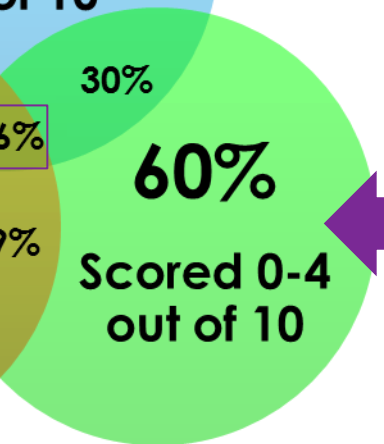


There is a clear opportunity to improve the user experience by expanding and upgrading the network

- Ease of using public charge points
  - Mean score of 5.5 out of 10



16%



- Ease of finding available (and working) points
  - Mean score of 3.9 out of 10

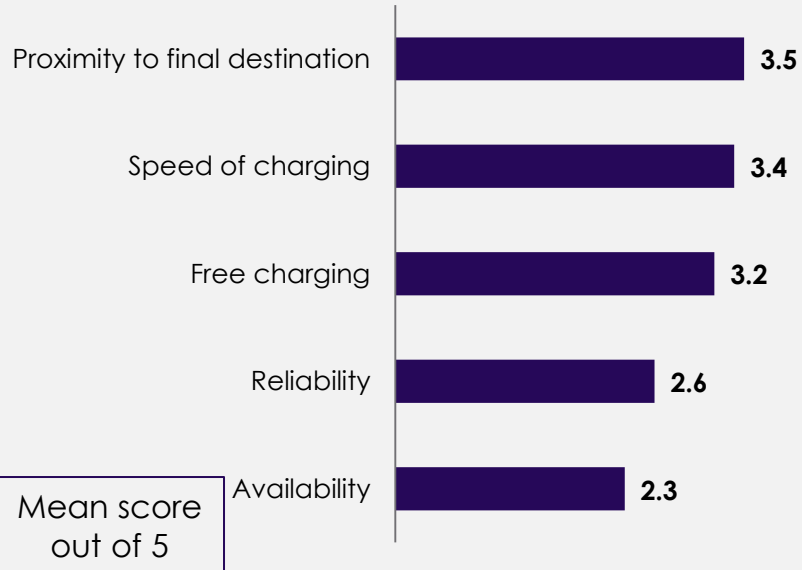
Base: All public charge point users (229)



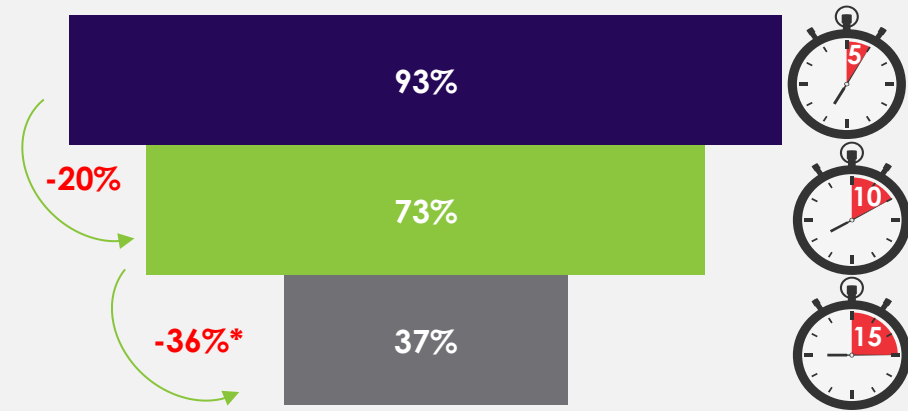
# Proximity to their final destination is the most important factor for public charge point users, followed by speed of charging

Low appeal of a charge point located 15 minutes' walk away

## Most important factor when using public charge points



## Likelihood of choosing to use public charge point ... minutes' walk from final destination



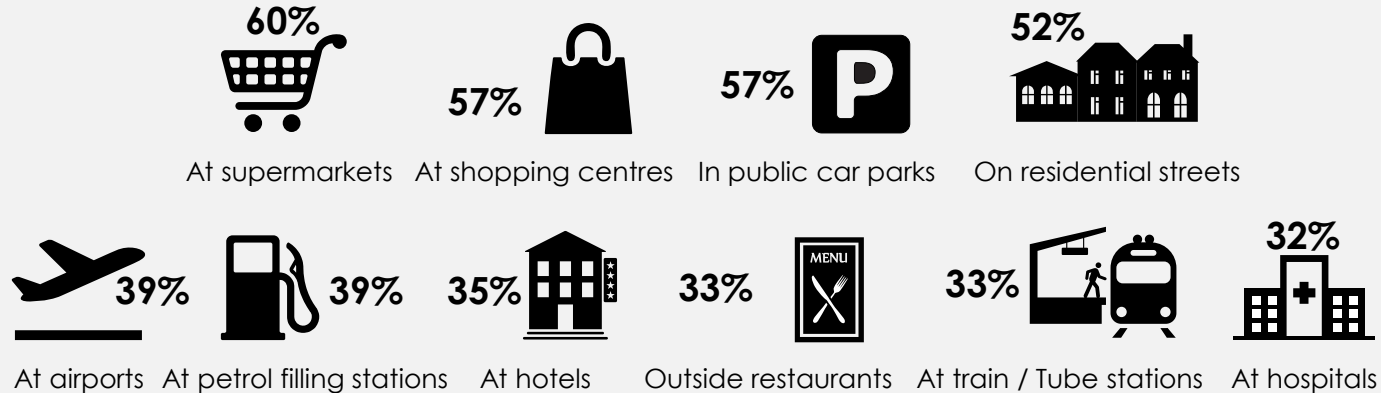
\*significantly different

D2 - Thinking about using public charge points, which of the following factors would be the most important to you? D1: Thinking about when you use public charge points, how likely would you be to choose to use one if it meant...  
Base: All public charge point users (229)

# Nearly all (95%) EV users would like to see more public charge points in London

Mainly at supermarkets, shopping centres, in public car parks and on residential streets

## Where EV users would like to see more public charge points

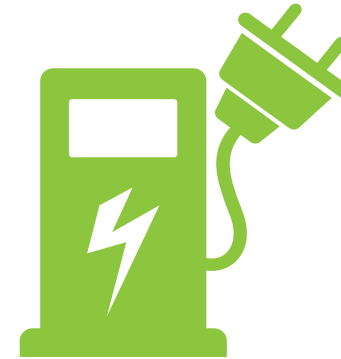
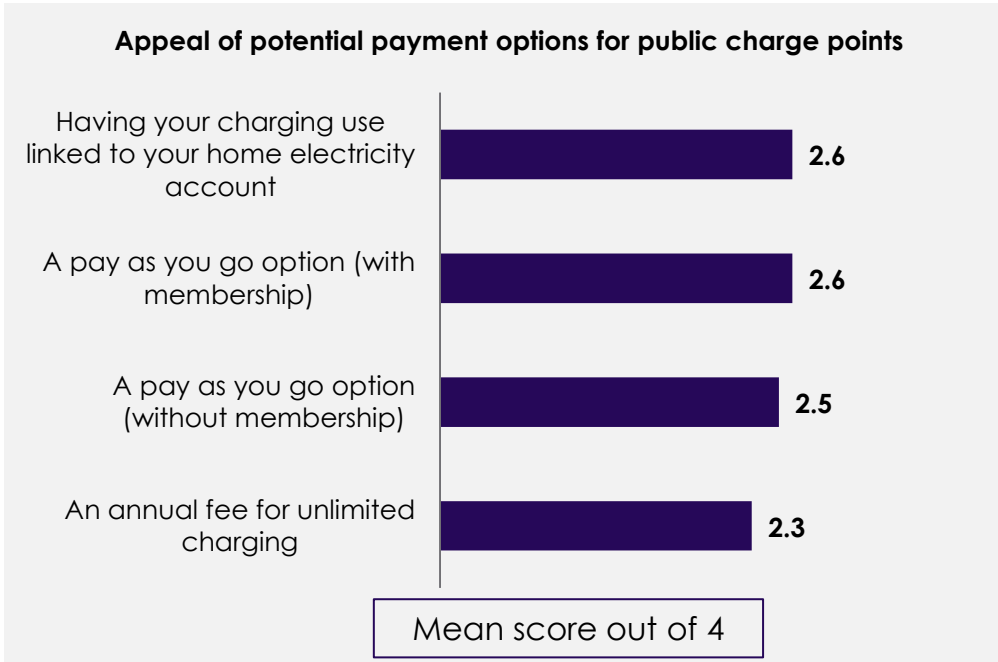


And when asked what they would campaign for if they were part of a committee responsible for expanding the public charge point network in London, **33%** mentioned additional charge points

C22 Imagine you were part of a committee responsible for expanding the network of public charge points in London, what would be the one thing you would campaign for? C23 In your opinion, are there any places in London where you would like to see more public charge points?

Base: All respondents (373)

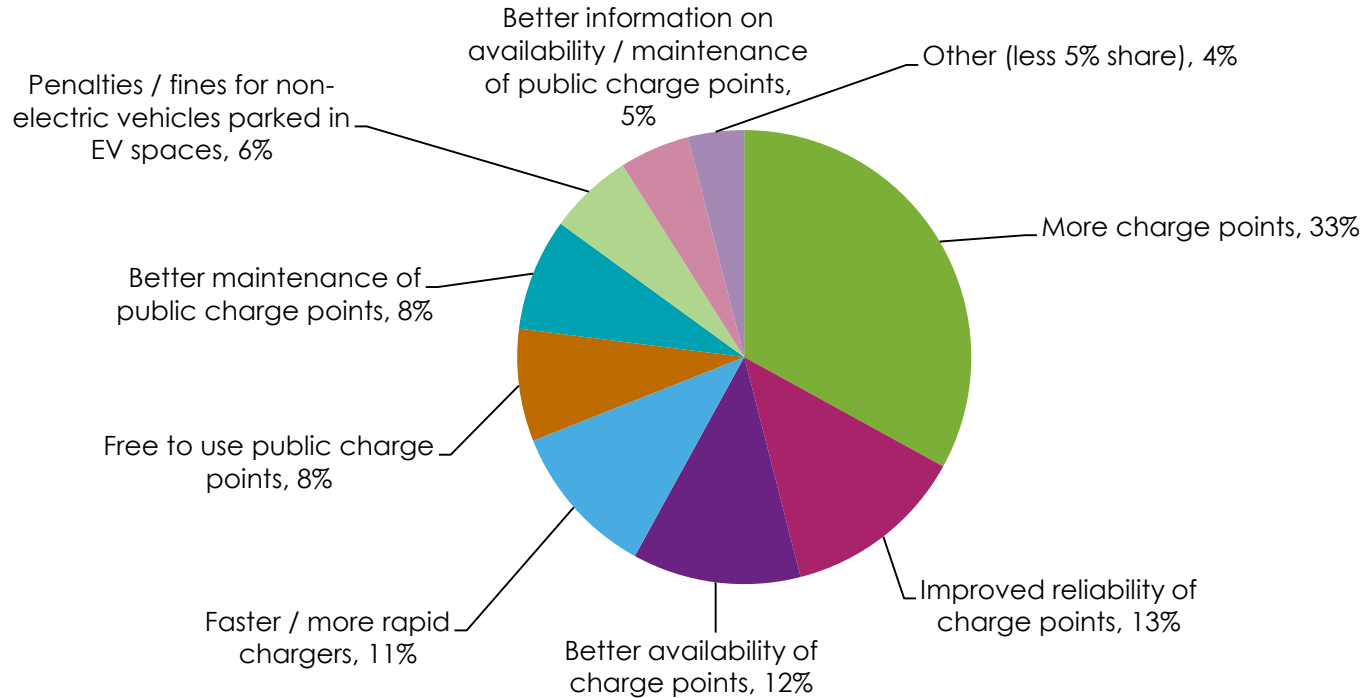
# Appeal of potential payment options for public charge points is broadly similar with no clear preference



D3 If you had to pay to use public charge points in London, which of the following options would be the most appealing to you?  
Base: All public charge point users (229)

# A third of EV users would campaign for additional charge points if they were part of a committee

What EV users would campaign for if part of a committee



C22 Imagine you were part of a committee responsible for expanding the network of public charge points in London, what would be the one thing you would campaign for? Base: All respondents (373)



Current charging habits

# Overview of current charging habits

67%  
of all EV  
users



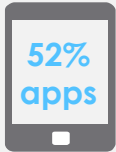
plug in at least  
once a day

56%  
of all EV  
users

choose to plug in  
when their state of  
charge is <50%.  
25% plug in whenever  
they can

81%  
of public  
charge point  
users

use digital sources  
to help them find  
available points

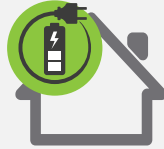


52%  
apps



80%  
websites

Among all EV users...



73%

charge  
at  
home



62%

charge  
in  
public

(59% at least once a week)

out of

8

10

Proximity to final destination is very  
important to **public charge point users**



61% of all respondents  
are Source London  
members

27%

use Source London points at  
least once a day

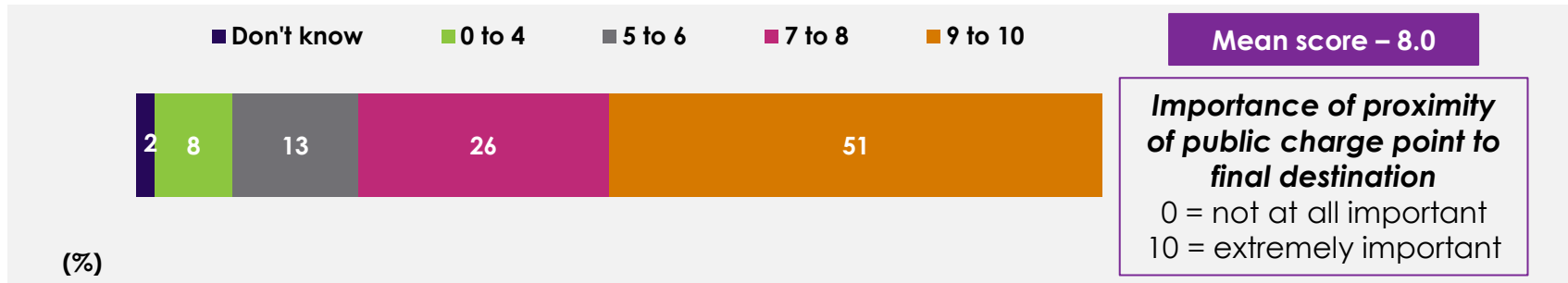


of **public charge  
point users**  
currently park  
within **15 minutes'**  
walk of their  
destination



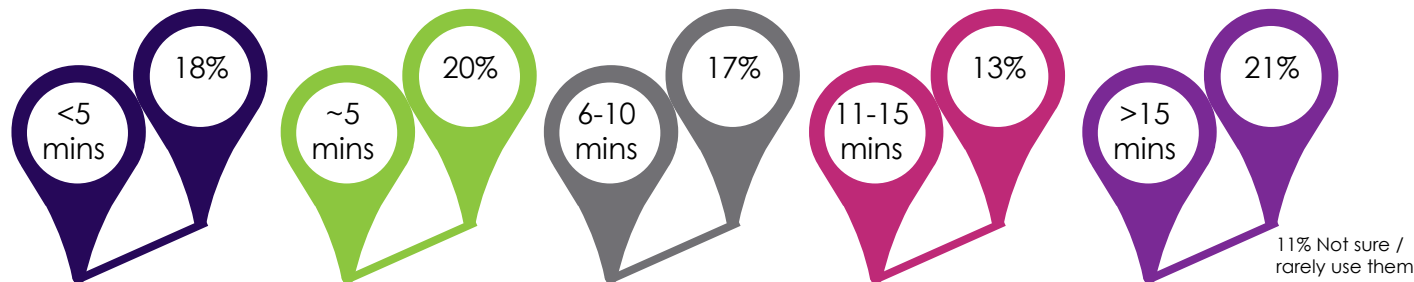
# Proximity to their final destination is very important to current public charge point users

Just over half currently park within 10 minutes' walk of their destination but a third park more than 10 minutes away



## Distance currently walked from public charge points to destination

Based on claimed preference, the decision to walk more than 10 minutes is not made by choice



C6 When you use a public charge point to charge this electric / plug-in hybrid vehicle, how far from your final destination do you usually charge it?

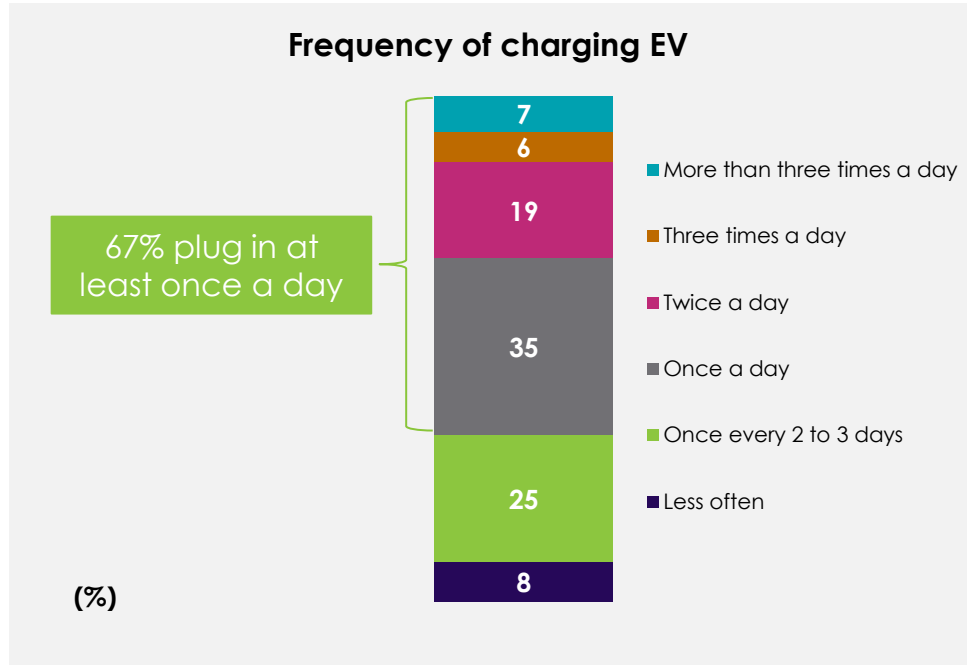
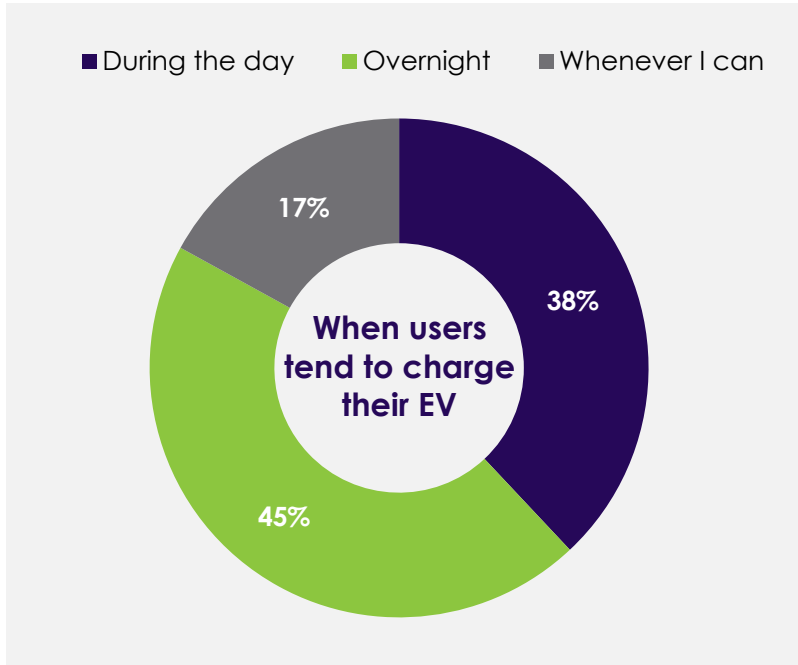
C8 When looking for a place to charge your electric / plug-in hybrid vehicle, how important to you is the proximity of the charge point to your final destination?

Base: All public charge point users (229)



# Most EV users charge their vehicles at least once a day

Overnight charging slightly more common than during the day



C4 When do you tend to charge this electric / plug-in hybrid vehicle? C5 How often do you usually charge this electric / plug-in hybrid vehicle?

Base: All respondents (373)

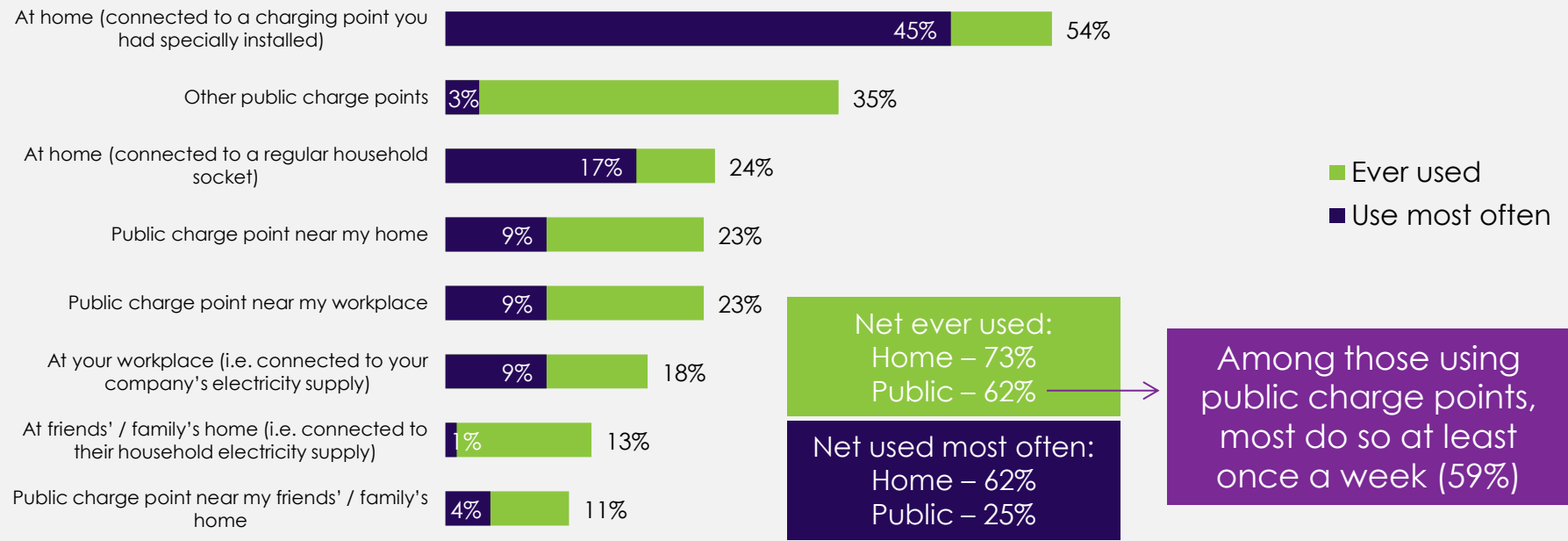




# They tend to charge at home, mainly using a charge point that was specially installed

Most public charge point users do so regularly (at least once a week)

## Where EV users charge their vehicles



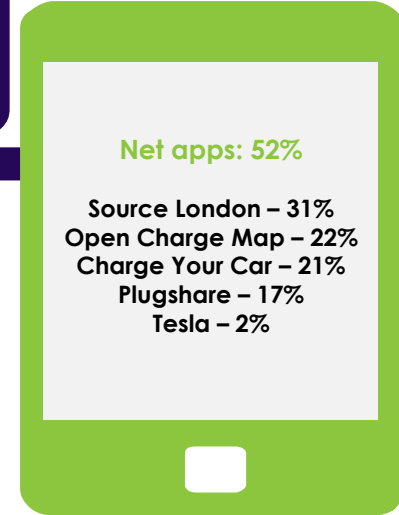
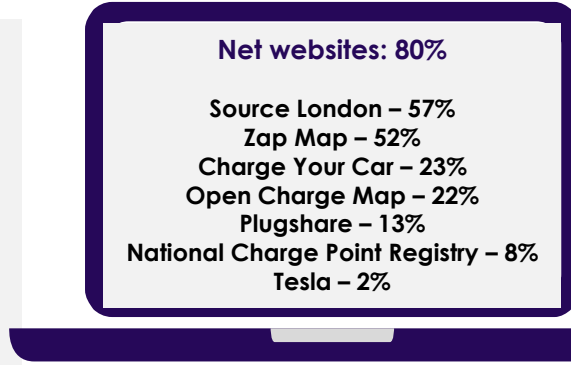
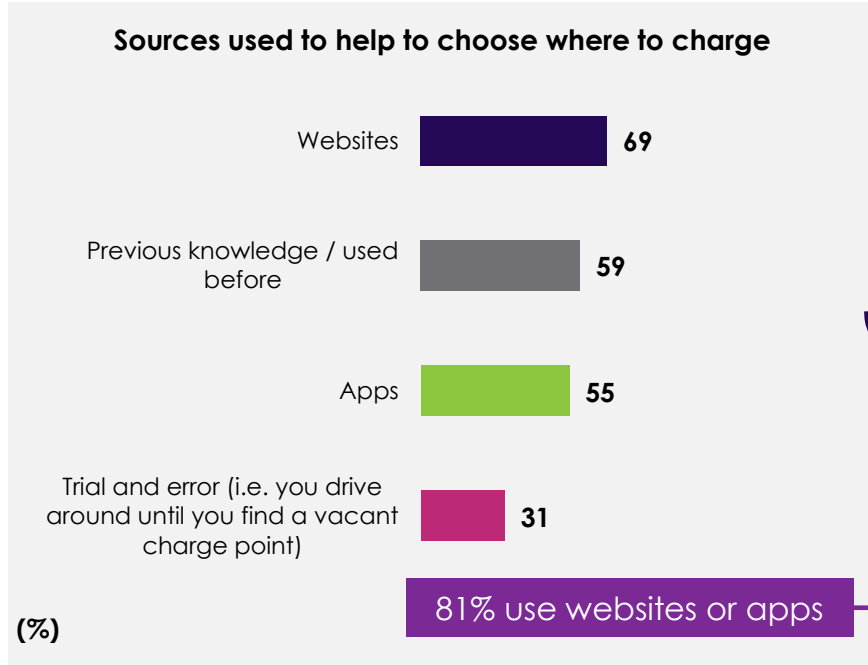
C1 Where do you charge this electric / plug-in hybrid vehicle? C2 And which of these do you tend to use most often? Base: All respondents (373)  
 C3 How often do you use public charge points in London? Base: All public charge point users (229)





# Digital sources are used by most public charge point users to help them find available points

Source London is the most commonly used website and app



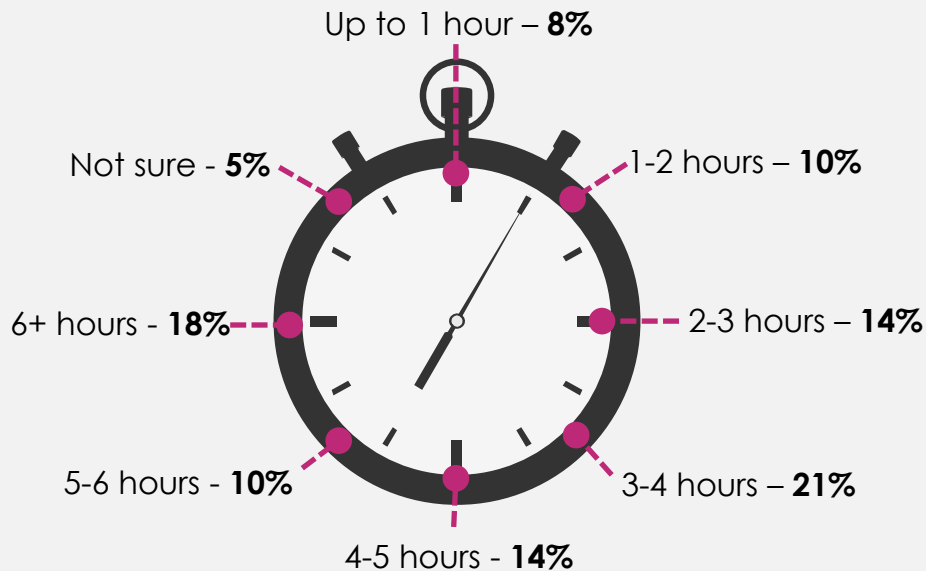
C14 Which of the following sources, if any, do you use to help you choose where to charge your electric / plug-in hybrid vehicle in public? Base: All public charge point users (229)

C15 Which of the following Websites/Apps have you used to help you find available charge points in London? Base: All using websites or apps (186)

# Most feel the need to charge their vehicle when it is less than half full, while a quarter charge whenever they can

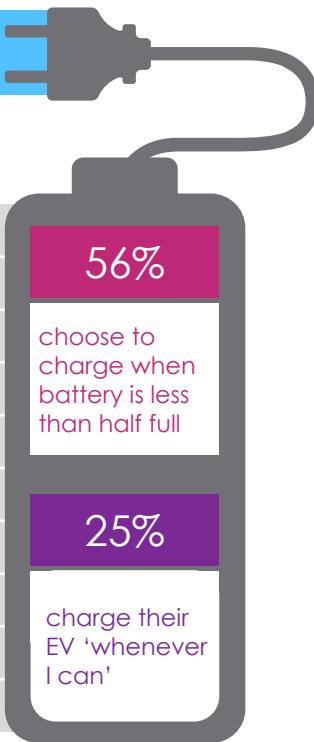
It takes at least two hours to full charge the majority of users' EVs

## Time taken to fully charge EV from an empty battery



## State of charge at which EV users feel the need to stop and charge

91-99%	2%
81-90%	1%
71-80%	3%
61-70%	3%
51-60%	6%
41-50%	5%
31-40%	10%
21-30%	15%
11-20%	16%
10% or less	10%



C9 How long does it usually take to fully charge your electric / plug-in hybrid vehicle (i.e. from an empty battery)?

C10 At what state of charge do you normally feel the need to stop and charge your electric / plug-in hybrid vehicle? Base: All respondents (373)

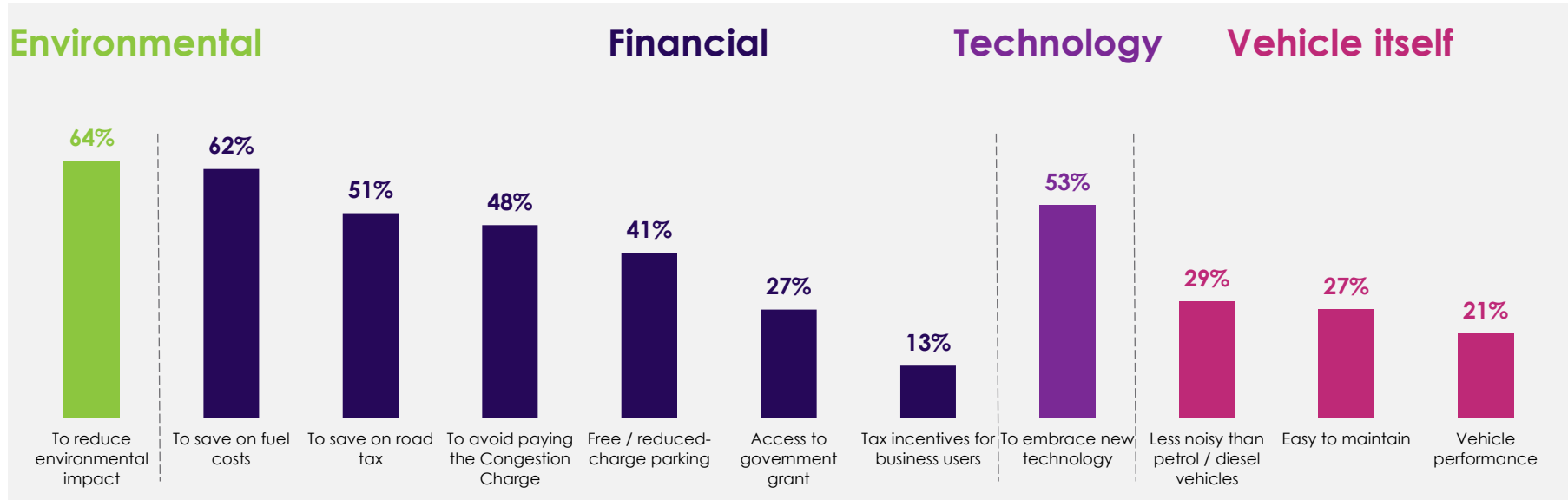


# The purchase process



# The main motivations behind EV purchase are environmental and financial benefits

Just over half (53%) said they were motivated by a desire to embrace new technology



B4 Which of the following, if any, motivated you to buy an electric / plug-in hybrid vehicle?

B6 How important to you was the battery charging speed when you were deciding which electric / plug-in hybrid vehicle to buy?

Base: All personal EV users (299)

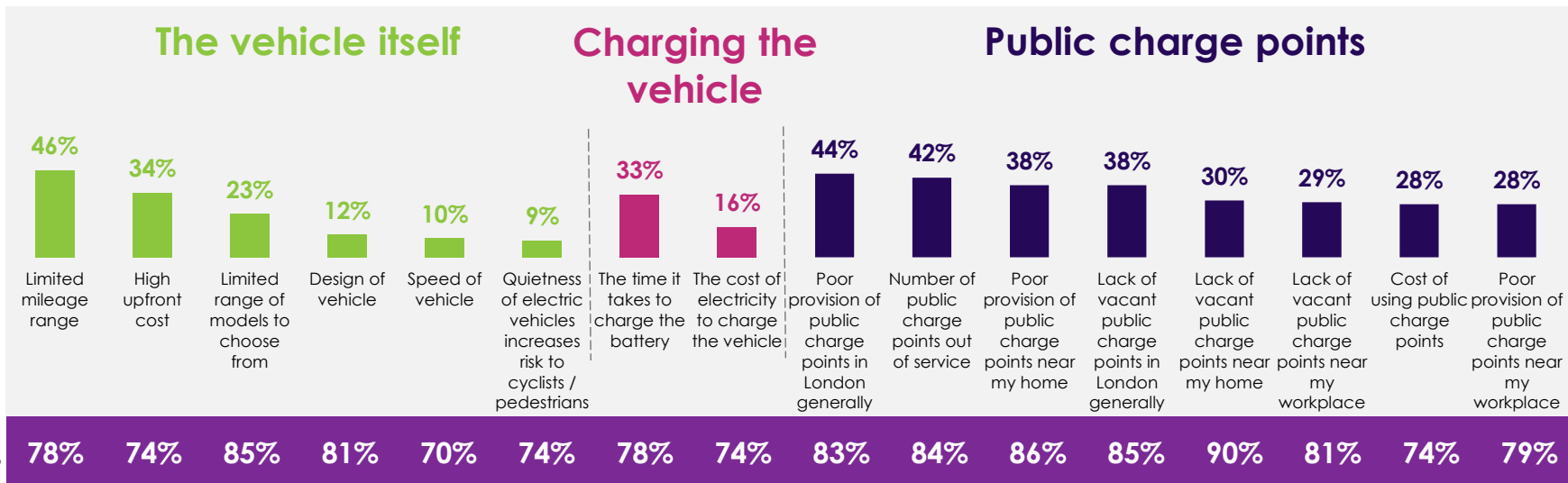
Importance of **battery charging speed** when deciding which EV to buy:  
**6.4 out of 10**



# Concerns expressed during the purchase process still appear to be an issue for the majority of personal EV users

Limited mileage range, poor provision of public charge points and the number of public charge points out of service are the most commonly recalled issues

However, it is worth noting that over half (54%) did not feel mileage range was an issue, and 22% of those initially concerned no longer consider it to be an issue



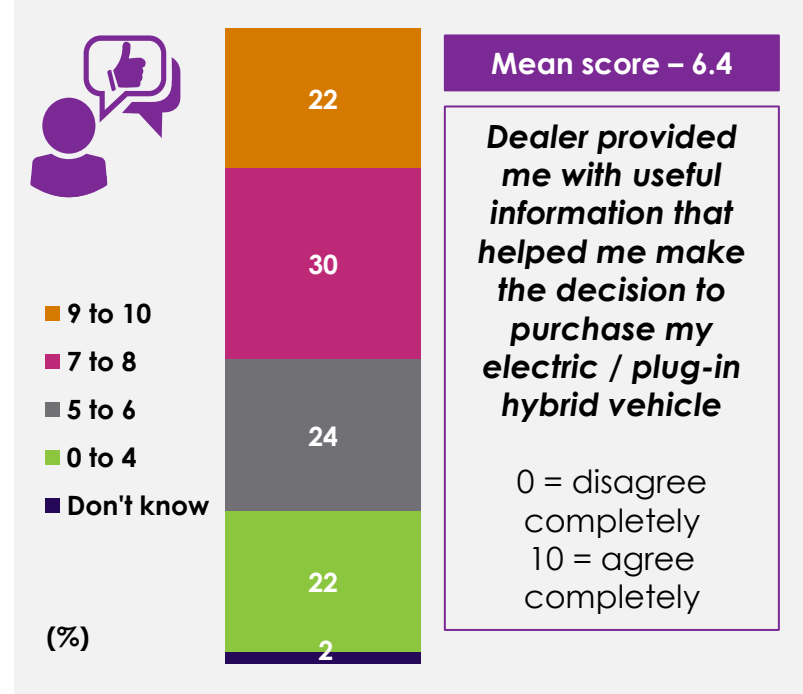
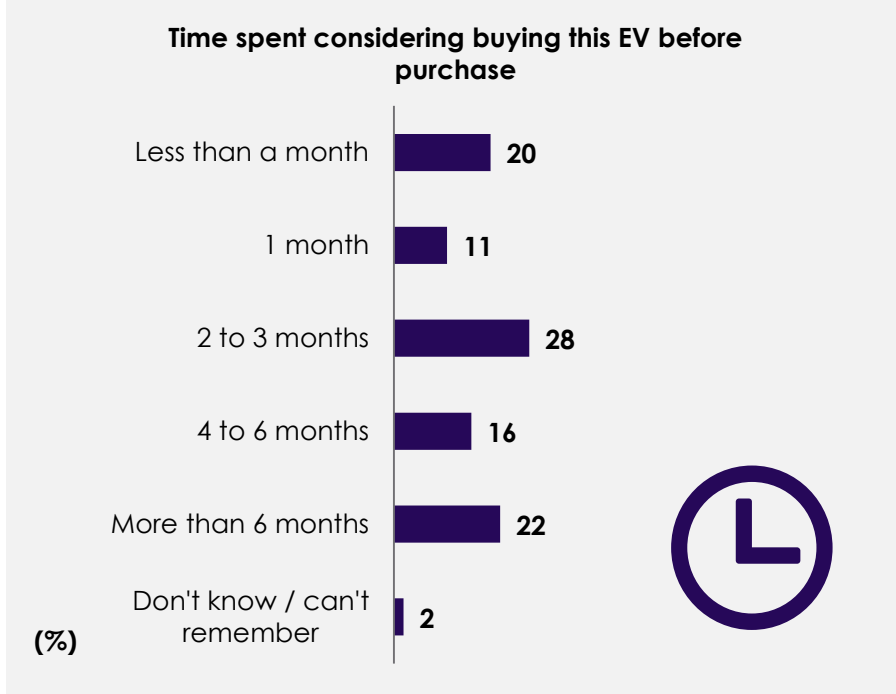
B2 Which of the following concerns, if any, did you have about buying this electric / plug-in hybrid vehicle? Base: All personal EV users (299)

B3b Is this still a concern for you as an electric / plug-in vehicle user? Base: All who had concerns when buying an EV (232)



# Those purchasing an EV generally felt the dealer was able to provide them with useful information

Two thirds considered buying an EV for at least two months before the actual purchase



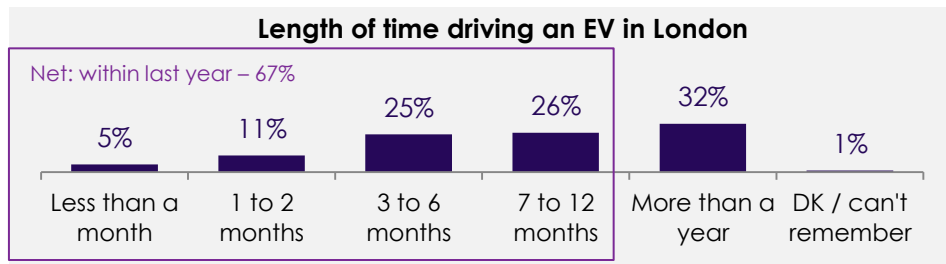
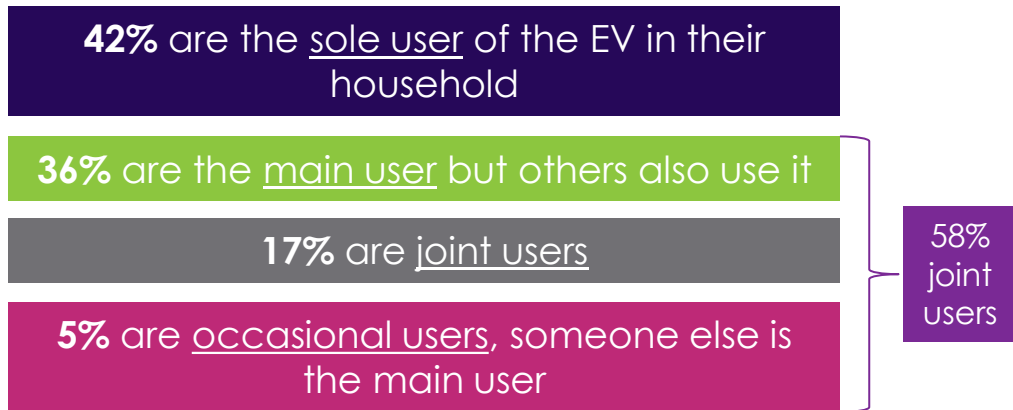
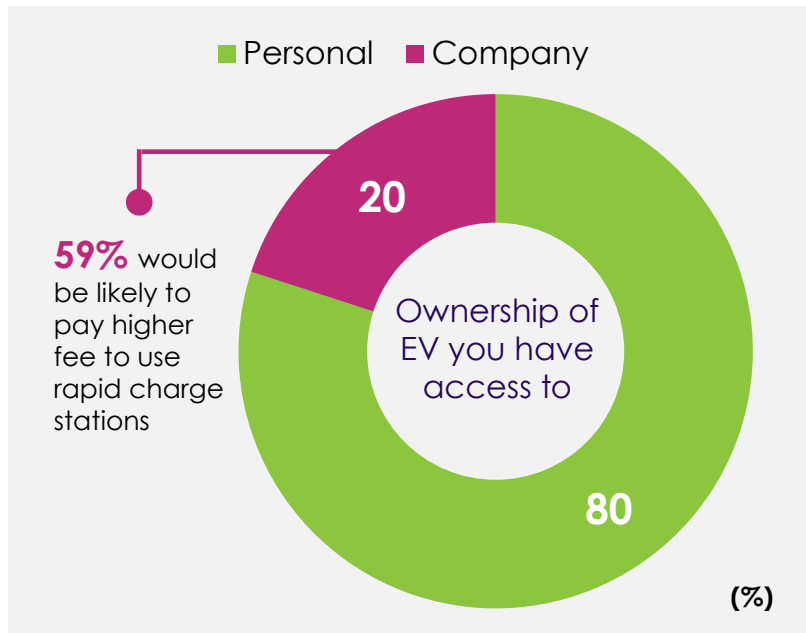
B1 Approximately how long did you think about buying this electric / plug-in hybrid vehicle before you actually purchased one? B7 During the purchase stage, how much do you agree or disagree that the dealer was able to provide you with useful information that helped you make the decision to purchase your electric / plug-in hybrid vehicle? Base: All personal EV users (299)



Electric vehicle usage

# The majority have access to a personal EV and have been driving an EV in London for less than a year

And most EV users are the sole or main user of this vehicle



A2 Which of the following best describes your use of the electric / plug-in hybrid vehicles in your household / your workplace? A3 Which of the following best describes this electric / plug-in hybrid vehicle? A4 How long have you been driving this electric / plug-in hybrid vehicle in London?

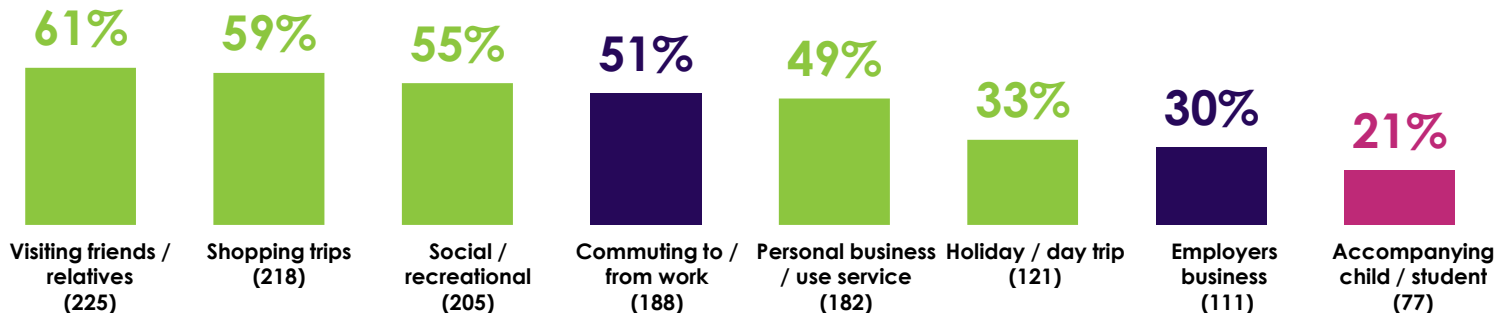
Base: All respondents (373)



# EVs are mostly used for leisure purposes

However, commuting trips are made most often, as would be expected given the nature of this type of travel

Net:  
Leisure trips – 85%  
Leisure trips only – 28%  
Work trips – 63%  
Work trips only – 13%



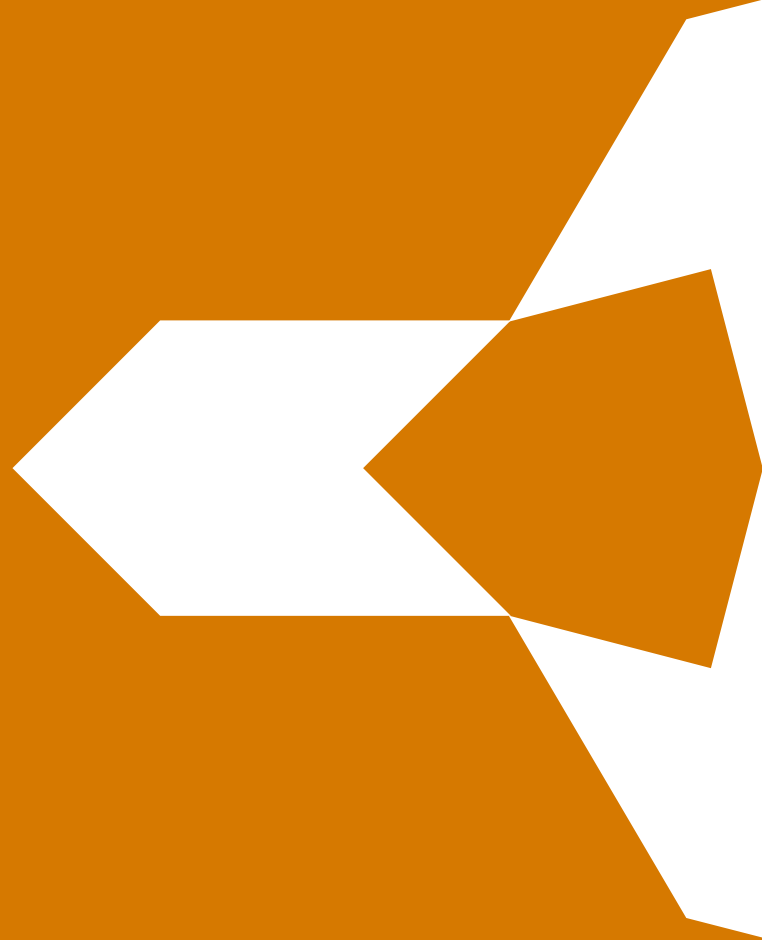
Types of journey made by EV	Visiting friends / relatives (225)	Shopping trips (218)	Social / recreational (205)	Commuting to / from work (188)	Personal business / use service (182)	Holiday / day trip (121)	Employers business (111)	Accompanying child / student (77)
Regular (at least once a week)	70%	78%	66%	89%	72%	22%	78%	81%
Occasional (less often)	30%	22%	34%	11%	28%	78%	22%	19%
Only make this type of journey by EV	4%	1%	3%	7%	3%	1%	4%	1%

A5 What types of journey do you make in London using this electric / plug-in hybrid vehicle? Base: All respondents (373)

A7 How often do you make these types of journey in London? Base: All making these journeys by EV (in brackets above)













# Appendix





# Makes of EV that users have access to

20%	15%	13%	12%	10%
				
9%	7%	4%	3%	3%
				

Other makes mentioned by less than 3% of respondents

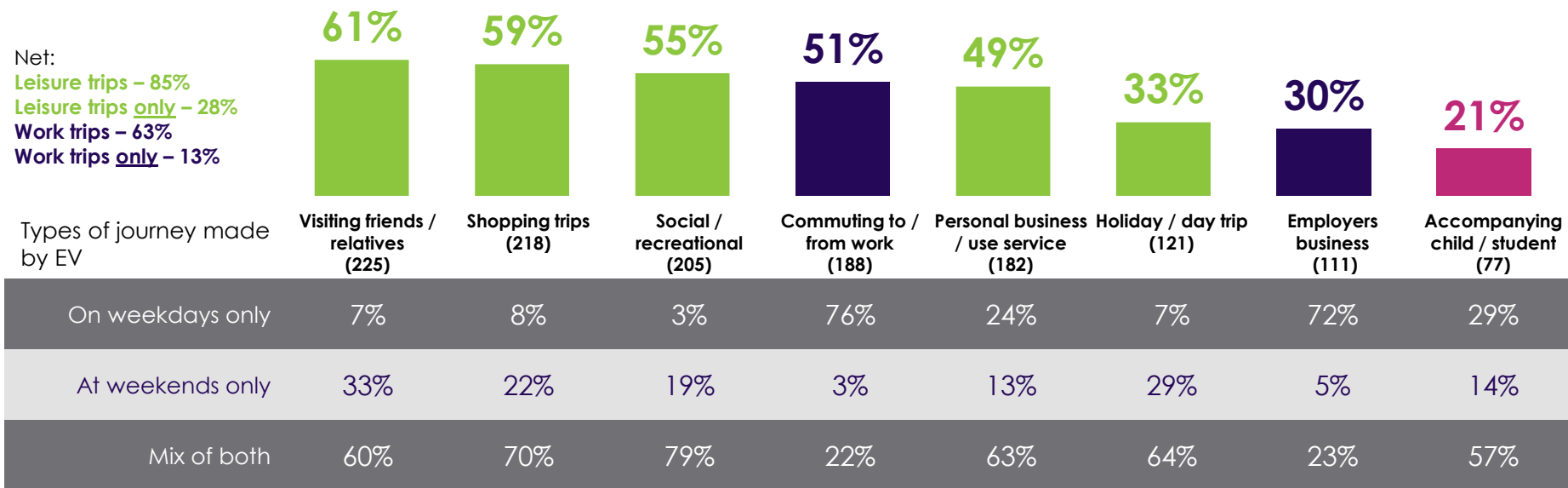
A1 Which of the following electric / plug-in hybrid vehicles do you have access to either in your household or through your work?

Base: All respondents (373)



# Work trips tend to be made on weekdays, while leisure trips are made on a mix of both weekdays and weekends

Net:  
 Leisure trips – 85%  
 Leisure trips only – 28%  
 Work trips – 63%  
 Work trips only – 13%

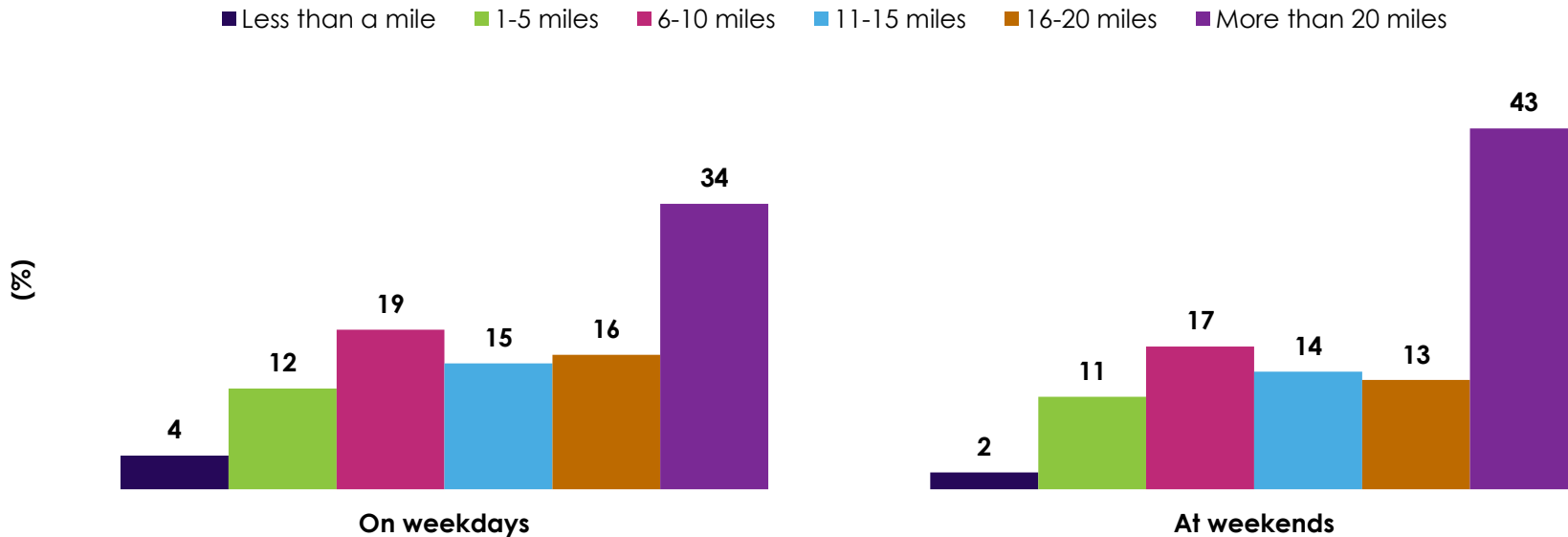


A5 What types of journey do you make in London using this electric / plug-in hybrid vehicle? Base: All respondents (373)

A6 When do you make these types of journey in London? Base: All making these journeys by EV (in brackets above)



# Many EV users travel more than 20 miles on weekdays or at weekends



A8 How far do you usually travel on an average day in your electric / plug-in hybrid vehicle?

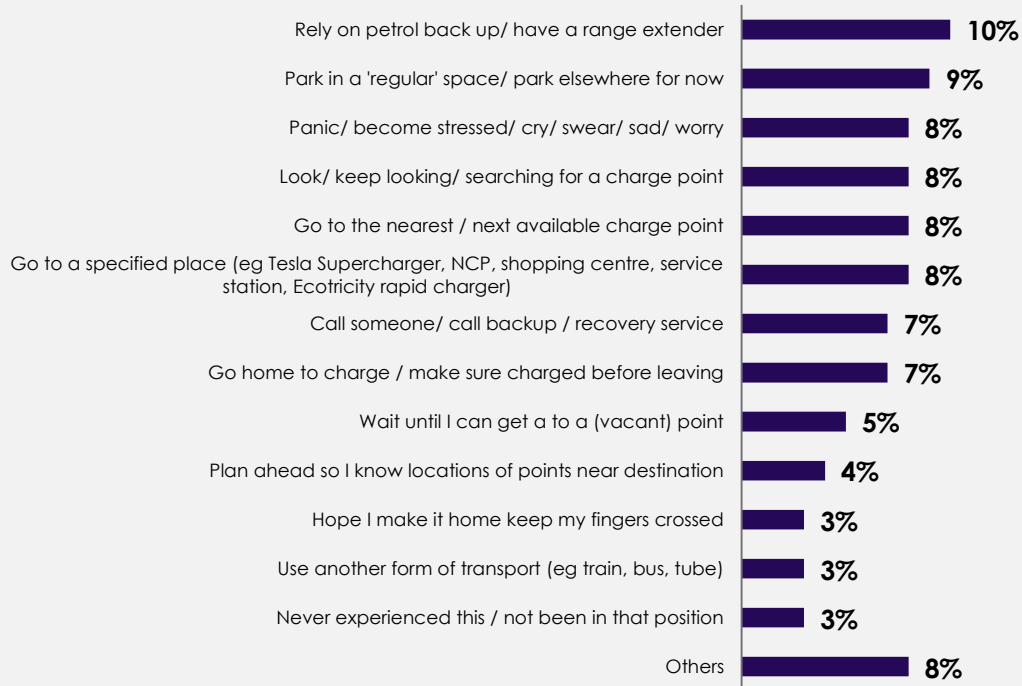
Base: All respondents (373)





# Actions taken when unable to find an available (and working) public charge point

## What EV users do when they can't find an available (and working) public charge point



Mentions below 3% not shown

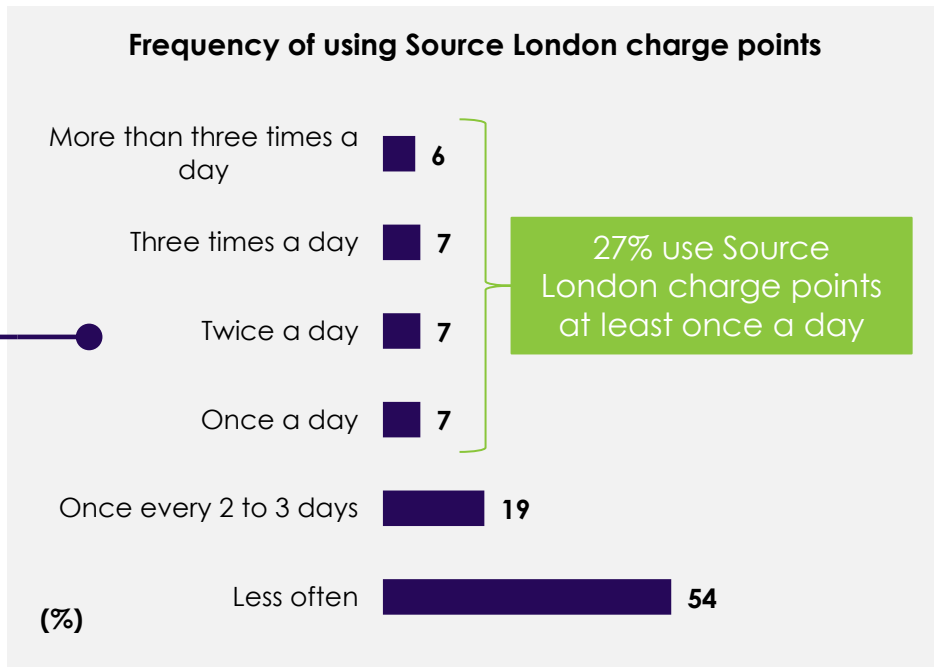
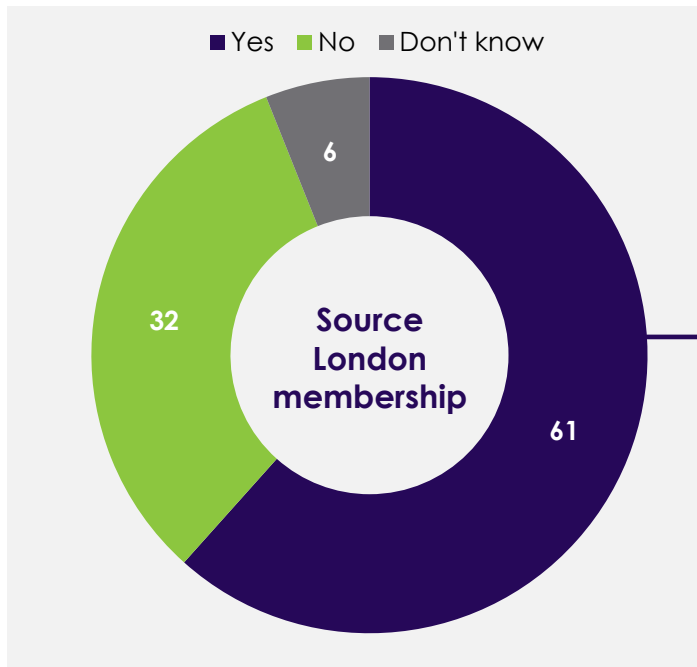
C18 What do you do in the event that you can't find an available (and working) public charge point?

Base: All public charge point users (229)



# Three fifths of respondents are Source London members

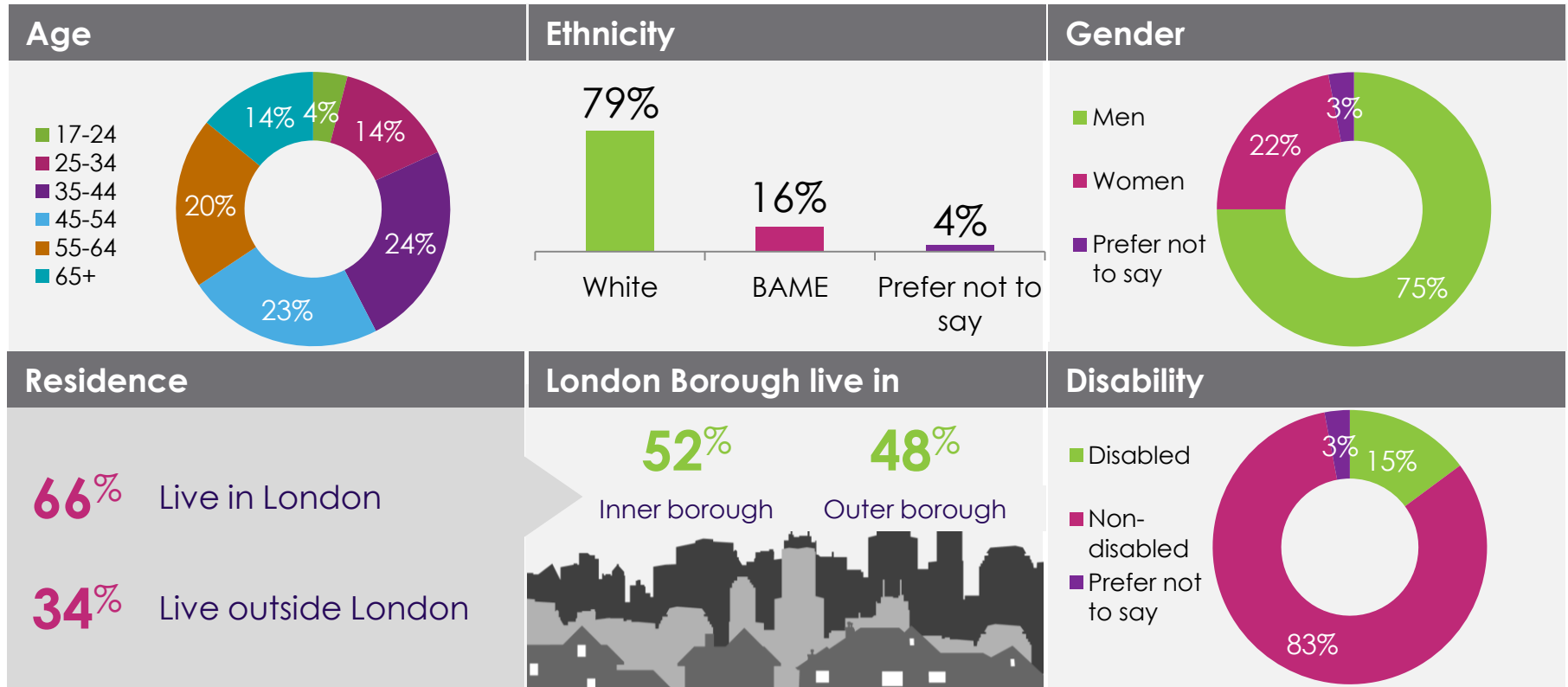
Around a quarter of Source London members use their charge points at least once a day



C20 Are you a member of Source London? Base: All respondents (373)

C21 How often do you use Source London public charge points? Base: All Source London members (229)

# We spoke to 373 EV users overall...



# future thinking

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- Corporate members of ESOMAR, the world association for market, social and opinion researchers
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- Future Thinking manage sensitive projects for UK Police and other UK Government departments where secure systems and data management is fundamental