



Project INFLEXION

Vehicle-to-everything (V2X) Consumer Survey Report 2023

In partnership with Strive Insight



Volkswagen



Understanding consumer attitudes is key to unlocking the potential of V2X

EV adoption is booming across the globe. To responsibly integrate these vehicles into existing energy systems and create a healthy grid, the industry needs to examine its charging infrastructure and strategy.

Through bidirectional charging, EVs can push excess energy back into homes and the grid - unlocking true transformation for customers, utilities and system operators. This technology is already here and it is known as vehicle-to-everything (V2X). V2X not only benefits customers with free driving miles, cheaper household energy bills and lower carbon footprints, but enables a more affordable and resilient

energy transition. Kaluza, Volkswagen Group, OVO Energy and Indra recently completed [Project INFLEXION](#), part of the V2X Innovation Programme, funded by DESNZ and delivered by Innovate UK.

As a consortium, we knew we needed to fully understand consumers' perceptions and attitudes to V2X so that we could identify ways to scale V2X for the future. We surveyed a nationally representative sample of over 2,000 EV drivers and 'EV considerers', across the UK. This represents the world's first V2X focused consumer survey, and hopefully not the last.



Understand the opportunity for bi-directional EV charging in the UK market

EV behaviour and attitudes

What are the opportunities amongst the EV target audience?

What are the behaviours and expectations around charging currently?

What are the key drivers, barriers and attitudes in the market?

Engagement with the V2X idea

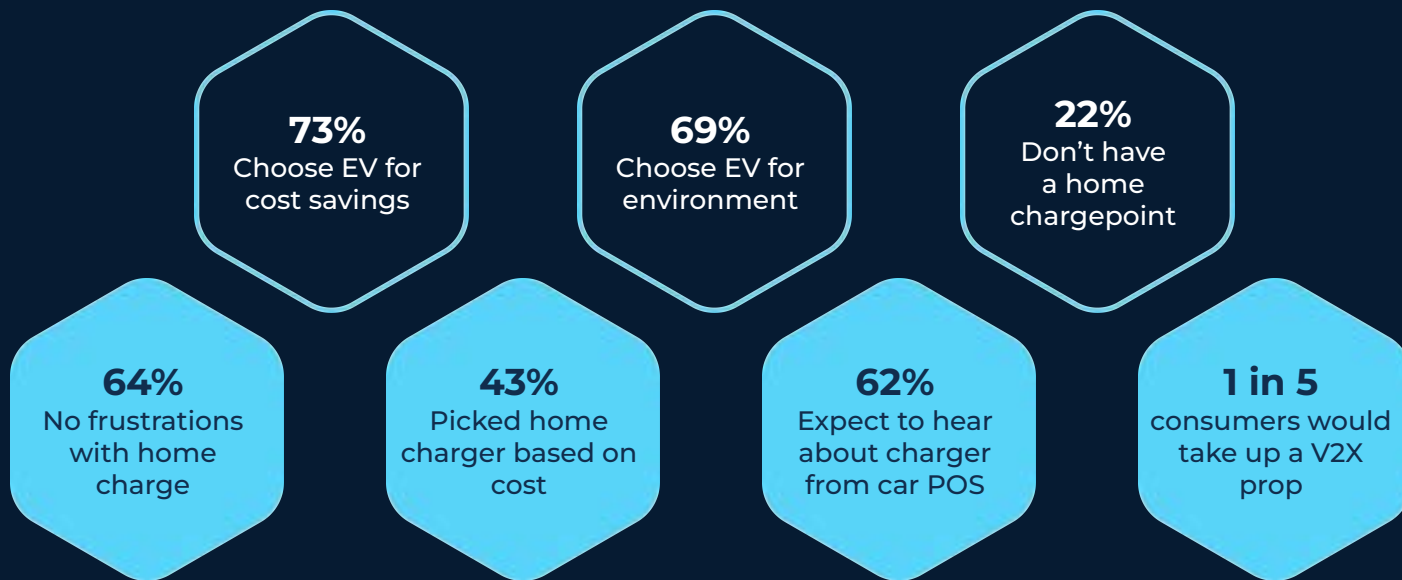
What is the appeal of our idea and who is most engaged?

What are the potential drivers and barriers to take up?

What do we need to do to increase consideration of the idea?



Summary of key findings



Contents

Context: Understanding the audience

What is current charging behaviour?

How appealing is V2X charging?

How does the audience react to V2X propositions?



Context: Understanding our core targets



We spoke to both EV drivers and EV considerer

2,003 personal car driver/decision makers across the UK
(15 minute online survey)



493 EV drivers

Fully EV drivers
(no hybrid or PHEV)



1,510 EV considerers

Will consider full EV for next
car purchase



EV drivers are slightly more 'engaged' with their vehicles than considerers



EV drivers

Drive their cars much more on more frequent trips

80% ↑

Drive 5,000+ miles a year

Bought their car more recently so not in the market again for a while

79% ↑

Bought car L24M

Are most focused on reducing high car running costs

80%

Chose car for cheap running costs



EV considerers

Drive less generally

67%

Drive 5,000+ miles a year

Have older cars, much more likely to be in the market soon

35%

Bought car L24M

Are driven by a broader range of purchase factors

46%

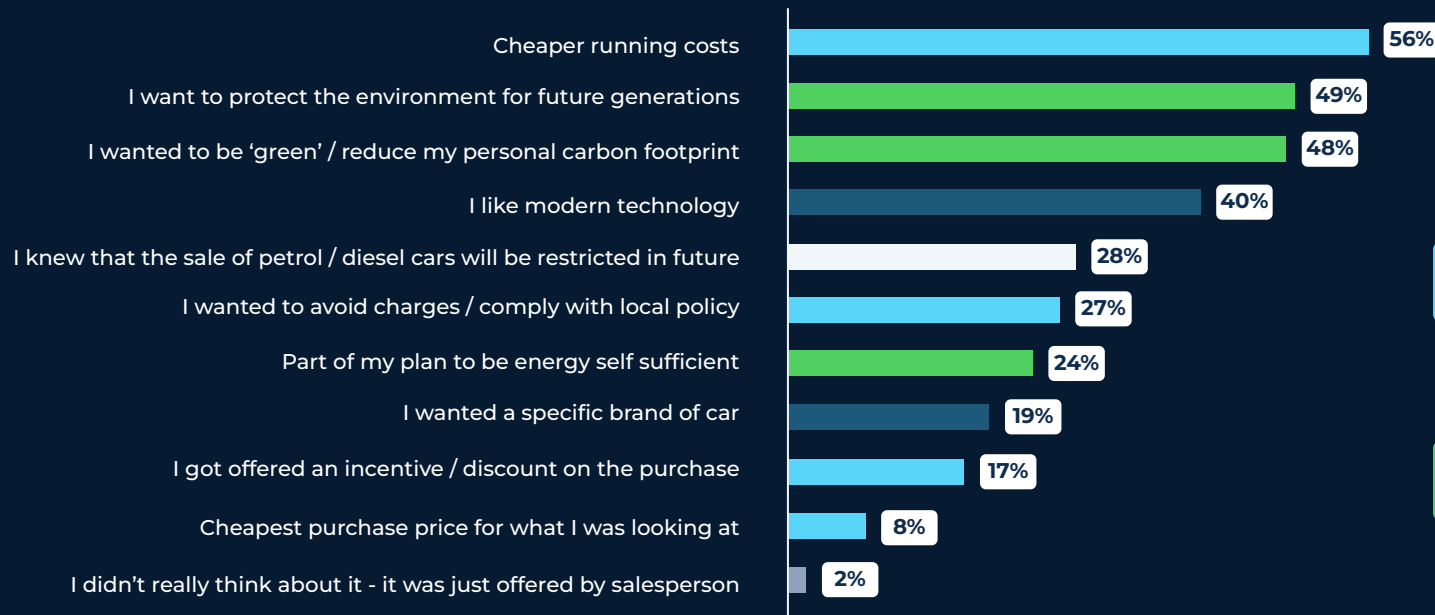
Chose car for cheap running costs



For drivers, reducing costs and environmental concerns have been key in EV take up



Reasons to choose an EV EV drivers



73%

Total choosing
for cost

69%

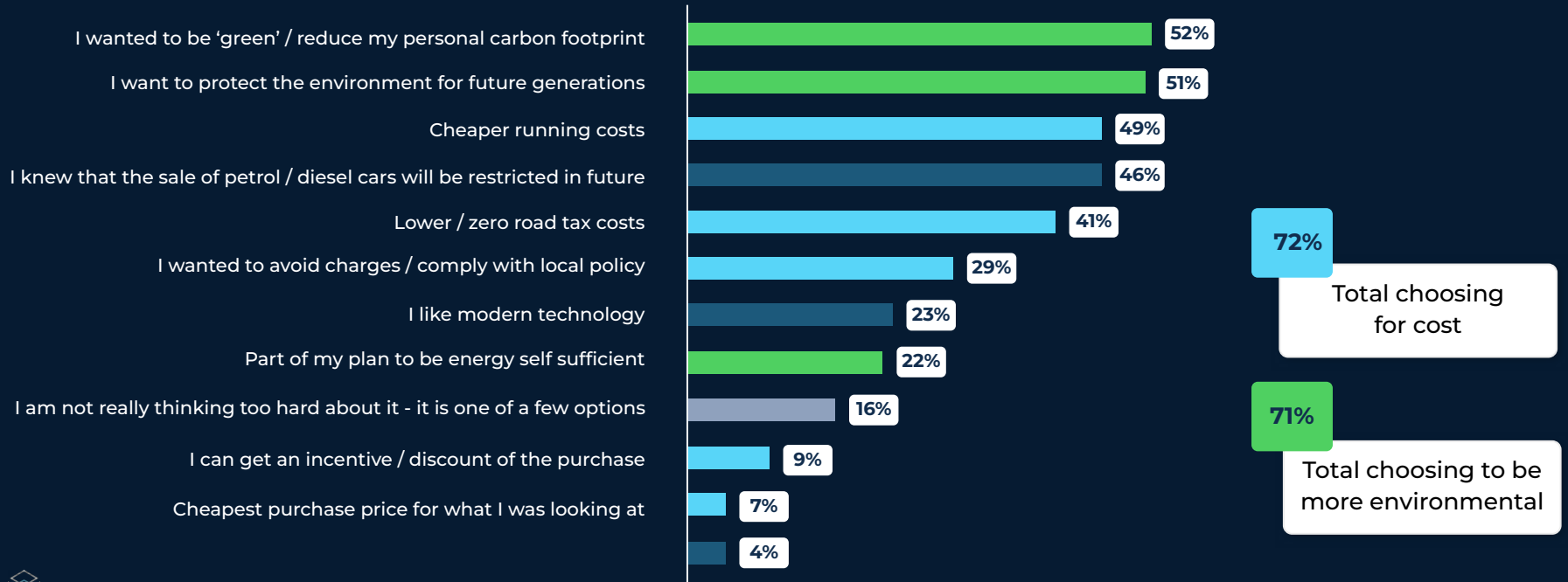
Total choosing to be
more environmental



EV considerers are slightly more environmentally driven but still want value



Reasons to choose an EV EV considerers



Base: EV considerers (1,510)

What is current charging behaviour?



In summary – What is current charging behaviour?



The majority of EV drivers have an established home base charging set up but less than half are charging on a regular, frequent basis.



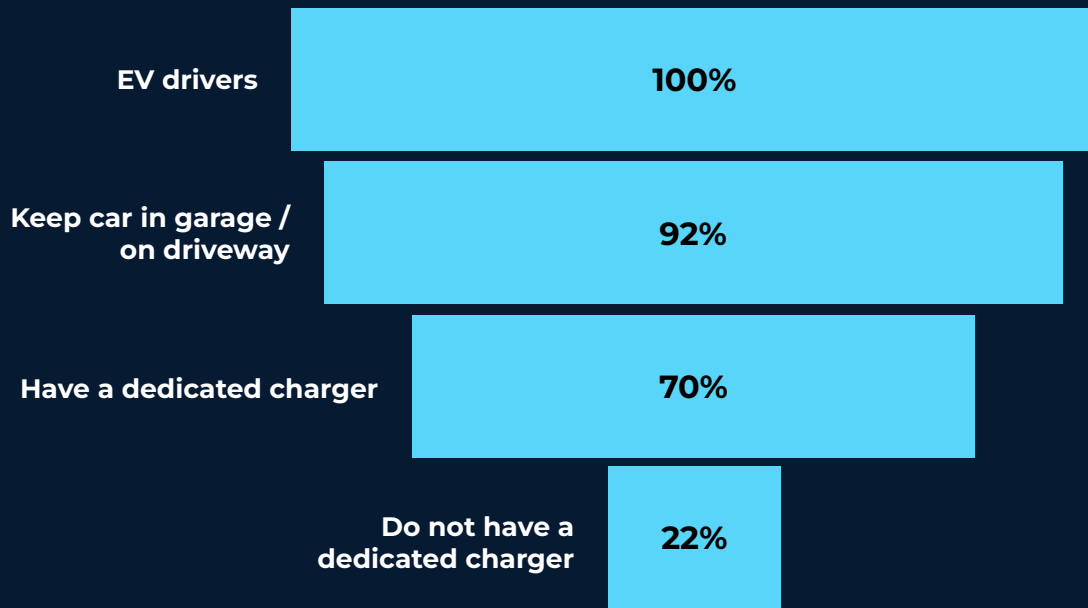
At-home charging isn't a pain point for drivers. The core frustrations are around out-of-home charging.



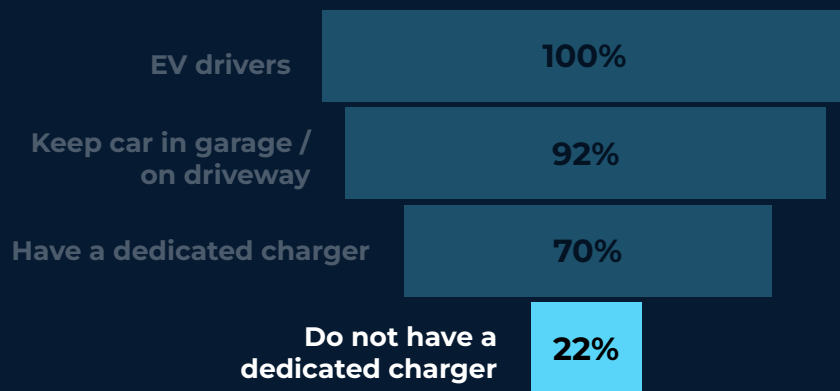
The main criteria, by far for choosing a dedicated charger is value.

Most drivers have a dedicated home charging solution

The home charging opportunity



EV drivers without a home charger are more restricted in their parking situation



Live in a less optimal property type for Home EV charging

44% ↑

Live in flat or terraced house

More likely to keep their EV away from home

30% ↑

Keep car on street or in a car park



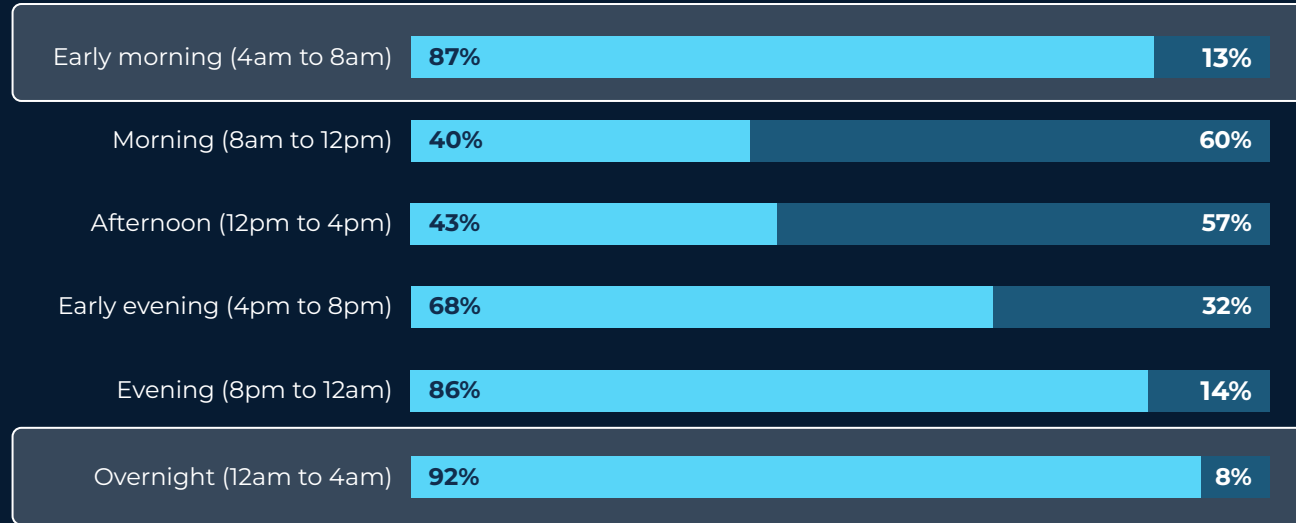
The majority of EV drivers will have their car parked at home during prime charging times

Where car is parked on a typical weekday



■ Mostly at or near home

■ Mostly being used



Prime off peak
charging times



Base: EV drivers (493)

However, less than half of EV drivers are 'regular chargers'



Regular Chargers
43%

Charge car whenever there is an opportunity to do so, or when car gets to 75% battery / range



Fill up from half
24%

Charge when car gets to 50% battery / range

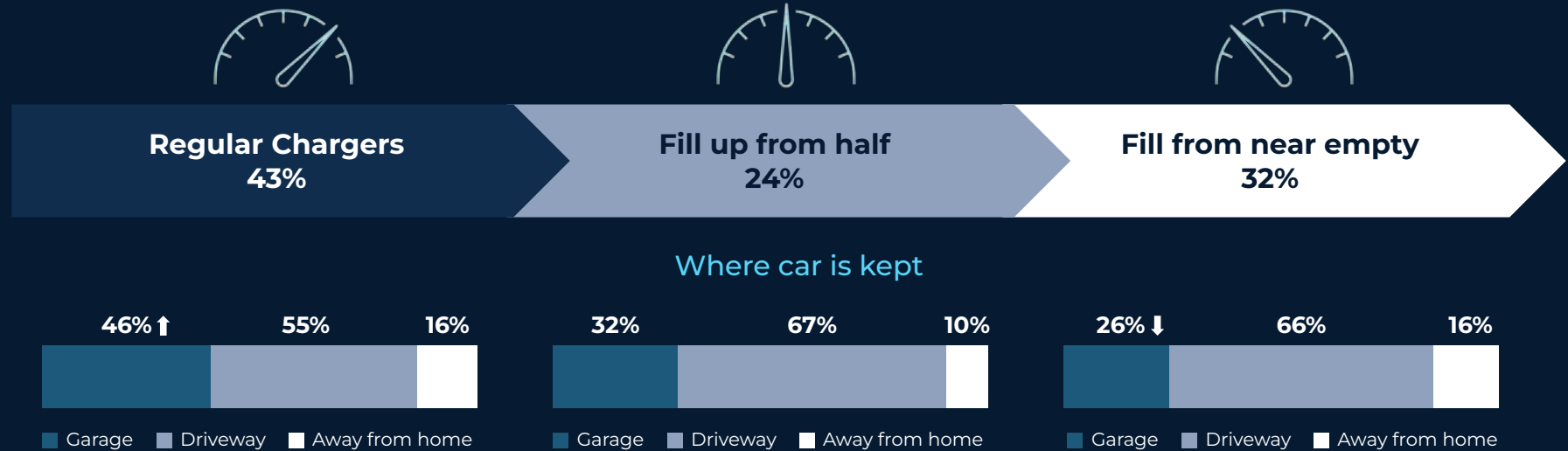


Fill from near empty
32%

Charge whenever there is a warning that range is low, or when car gets to 25% battery / range



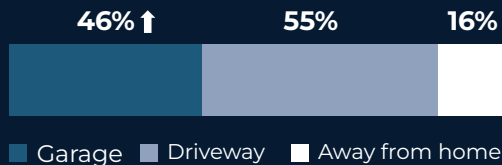
Regular chargers are significantly more likely to be garage based



And are much more likely to be driving longer distances

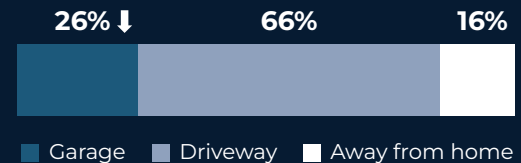
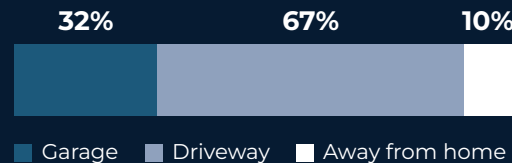


Where car is kept



28% ↑

More likely to drive
+10,000 miles a year

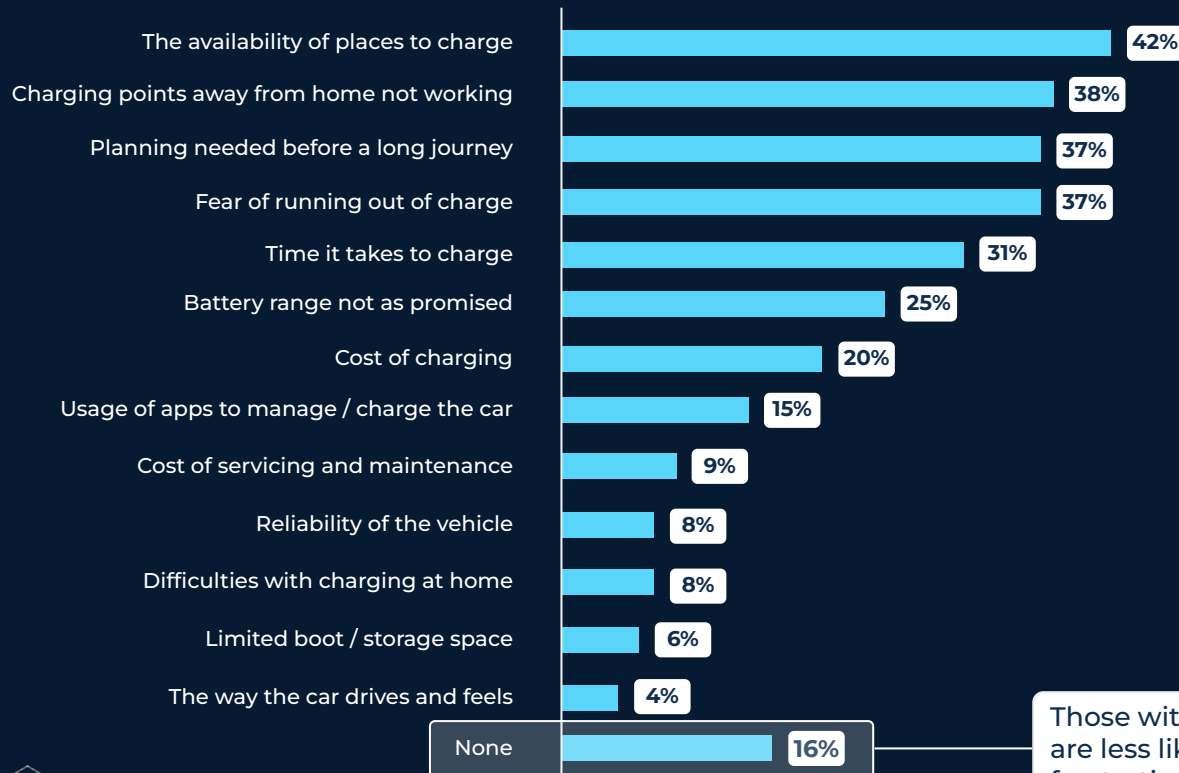


68% ↑

More likely to have owned
EV for more than 18 months

EV frustrations are common across all driver types

Frustrations of driving an EV



"Frustrations do not vary between regular and infrequent chargers (people who charge their car most days vs people who charge their car 1-2 times a week)"

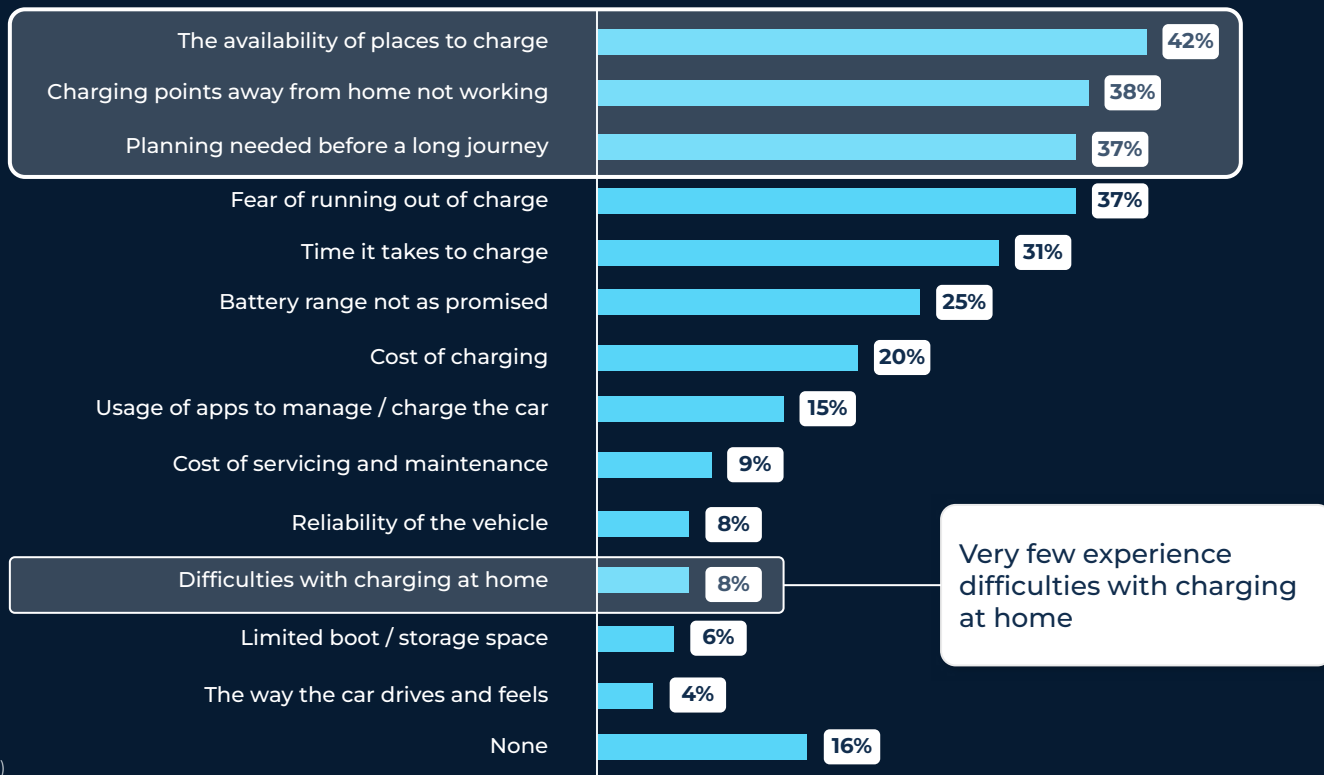
Those with a dedicated charger are less likely to experience any frustrations



Base: EV drivers (493)

The main frustrations with EVs are around charging *away from home*

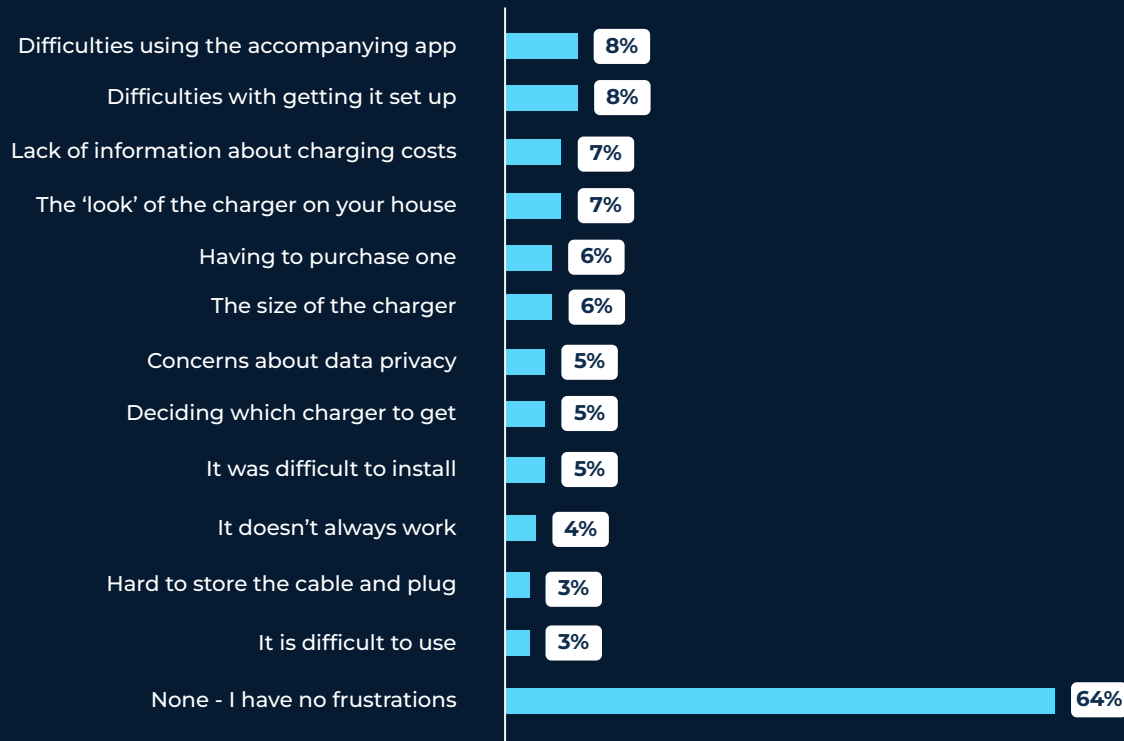
Frustrations of driving an EV



Base: EV drivers (493)

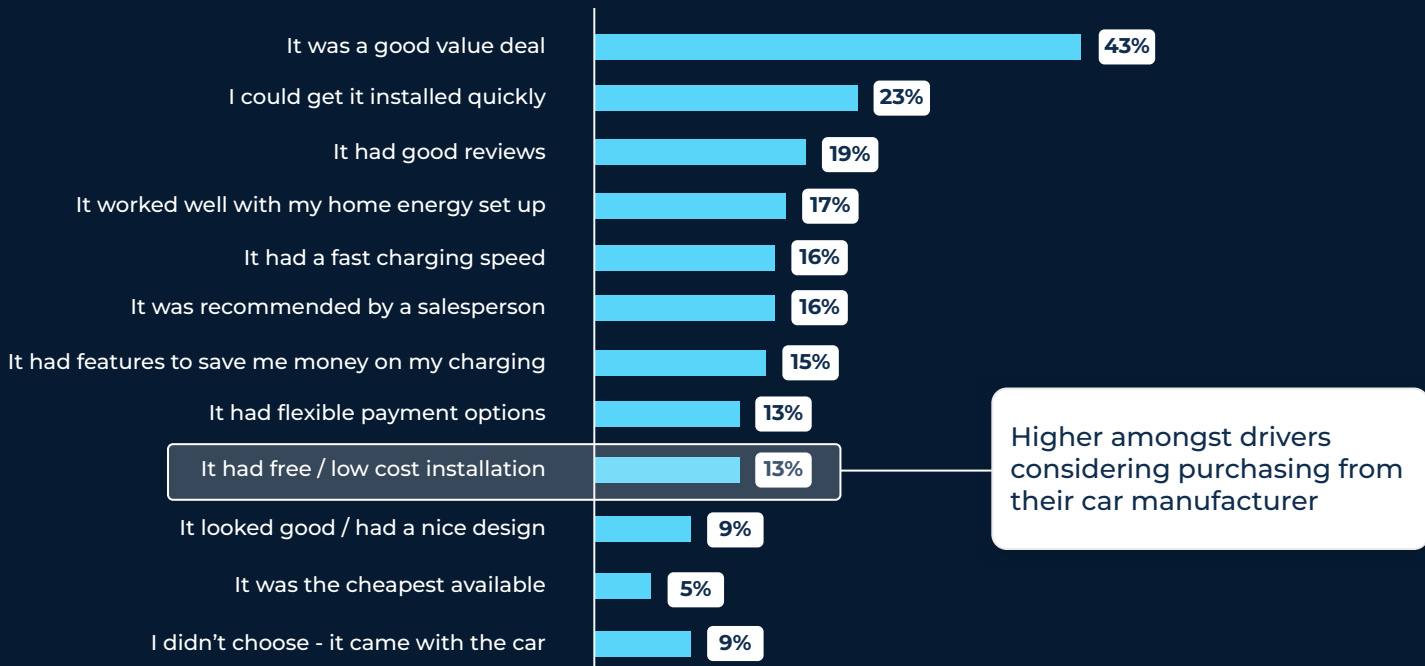
There are no clear or obvious frustrations with home charging

Frustrations with charging at home



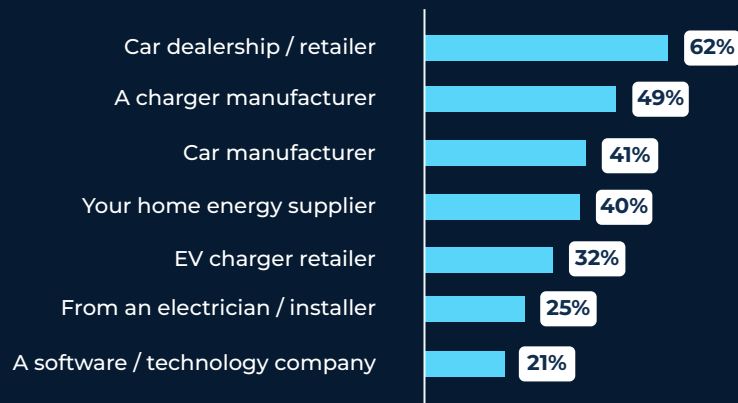
Value has been the key driver in home charger choice

Reasons to choose a dedicated charger

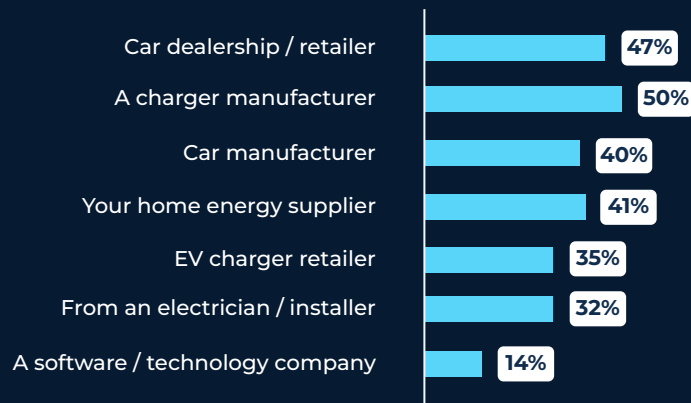


The main channels to research and purchase chargers are automotive specialists

Where they expect to hear about chargers



Where they consider purchasing chargers



Current charging behaviour – key implications



An existing set up at home



...which works well



Driven by value

EV drivers won't be looking proactively for improved solutions at home - and cost will be key. We'll have to work harder to create awareness and demonstrate the need and value of our V2X idea with them.

How appealing is V2X charging?



In summary – How appealing is V2X charging?



The general reaction to V2X is positive, but not overly strong. It is slightly higher amongst considerers.



Consumers do see the financial and environmental benefits the V2X solution can bring.



However they have concerns around the V2X charger's ability to protect battery health and provide value (issues that will be fundamental to driving purchase).

We showed survey respondents this stimulus

2 way (bi-directional) charging



A 2-way charger allows you to put in **and** take out energy from an electric car

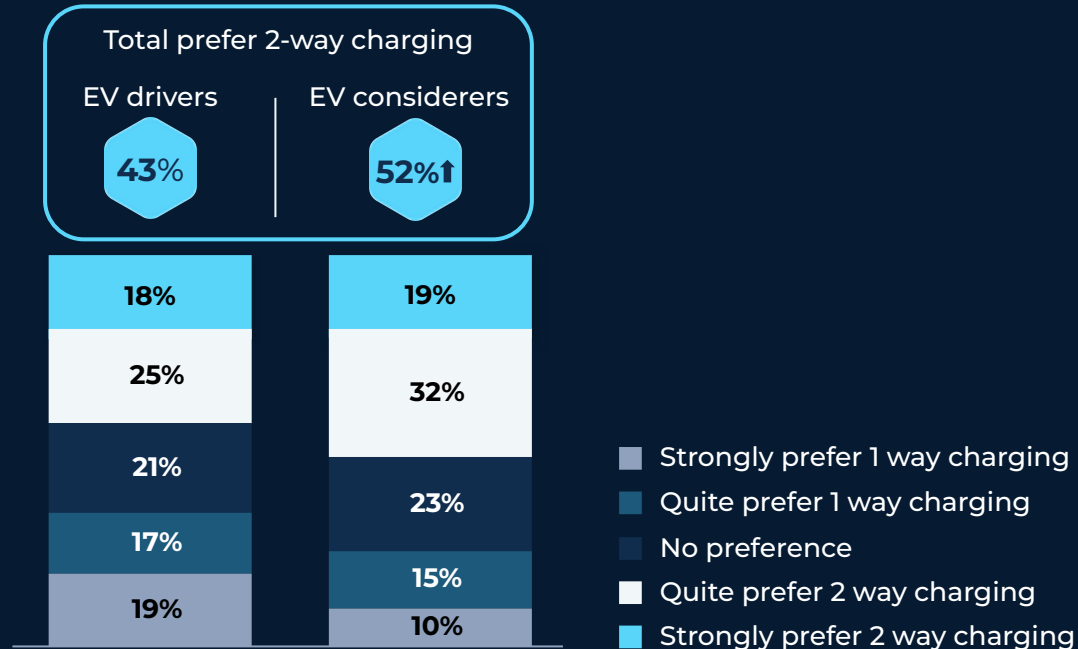


It costs more than a standard EV charger but it gives you more benefits

- It can **earn you money** by selling energy to the grid when prices are high
- It can **save you money** by using energy from your car to power your home rather than buying more energy
- Charge your vehicle at times when demand is low for **cheaper and greener energy**
- **Help the national grid** to efficiently balance demand and supply, and reduce reliance on fossil fuels

V2X has some appeal but it is not strong - and slightly higher amongst EV considerers

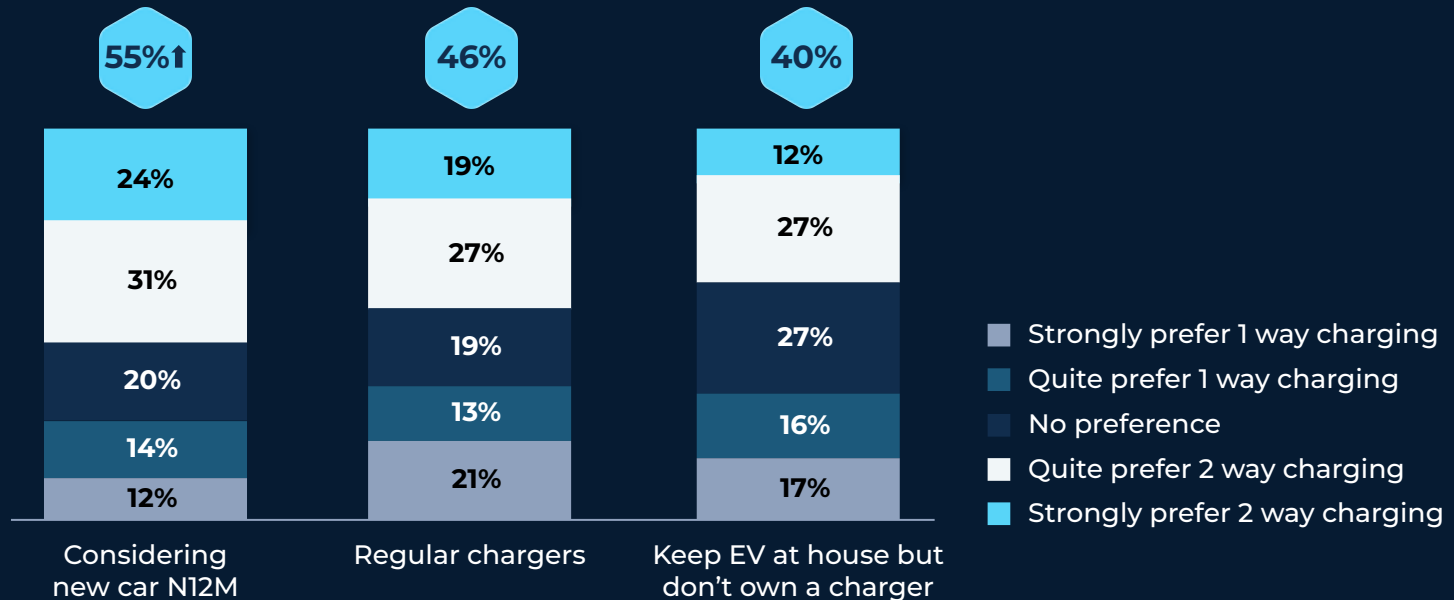
Preference for 2-way charging



Base: EV drivers (493), EV considerers (1,510)

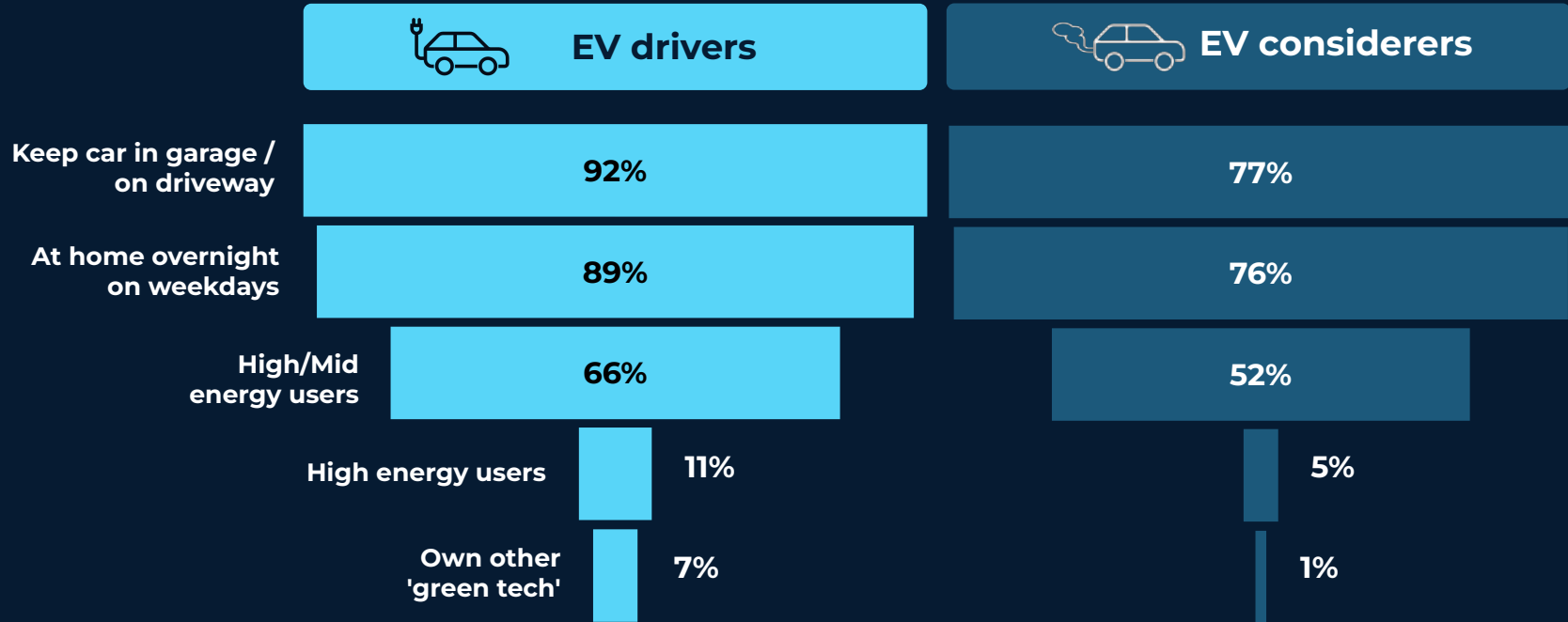
Appeal is also slightly higher with new car buyers and regular chargers

Preference for 2-way charging



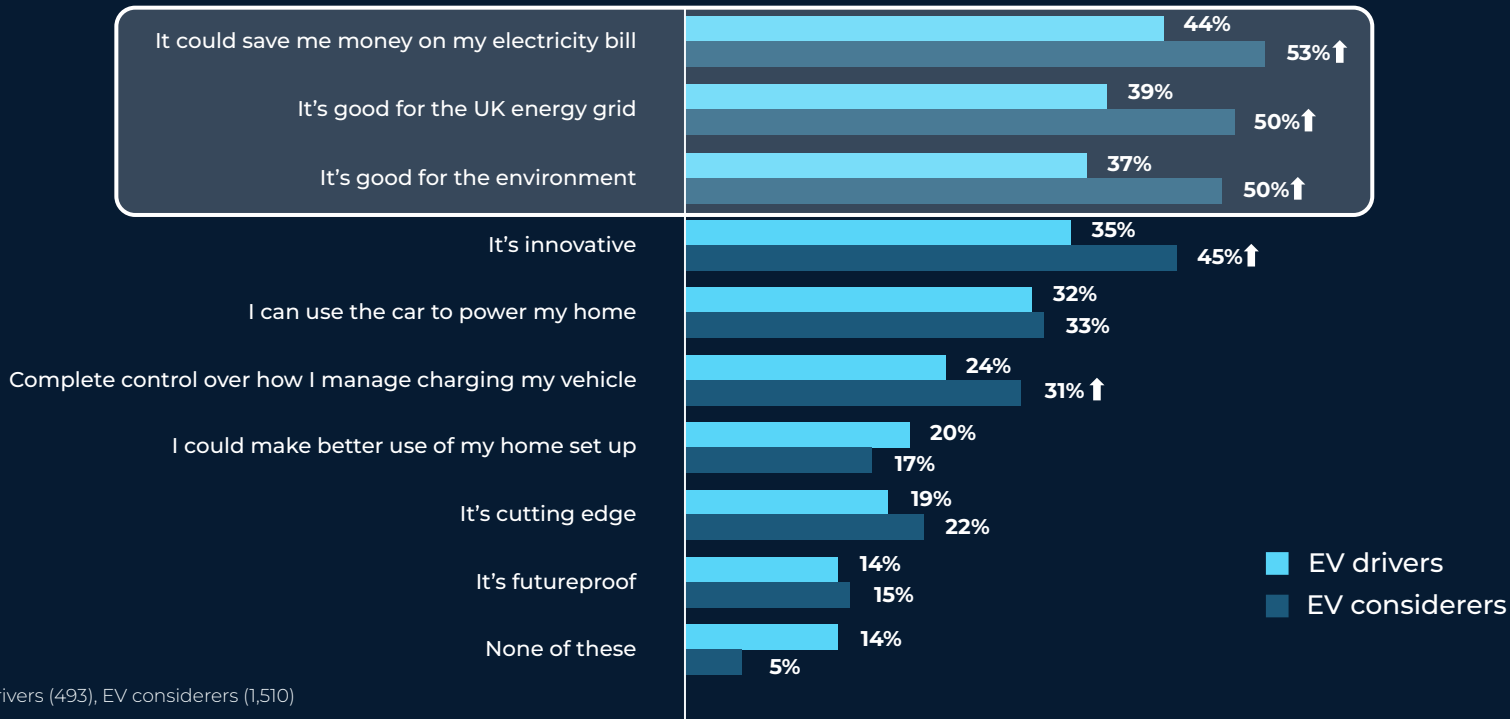
Base: EV drivers (493), EV considerers (1,510)

The 'prime opportunity' for V2X is relatively limited at present, so we will need strong appeal to succeed



The main benefits of V2X are seen as financial and environmental

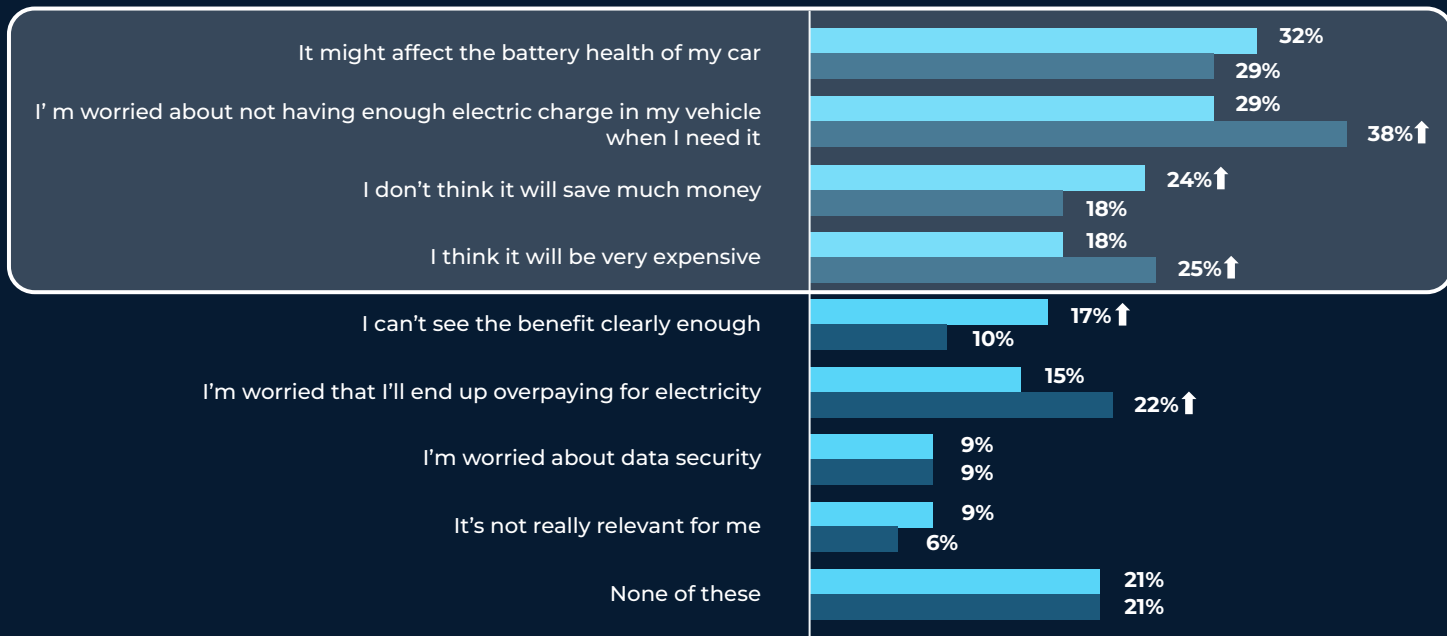
Perceived benefits of V2X



Base: EV drivers (493), EV considerers (1,510)

However there are credibility concerns around performance and value we will need to address

Barriers for V2X



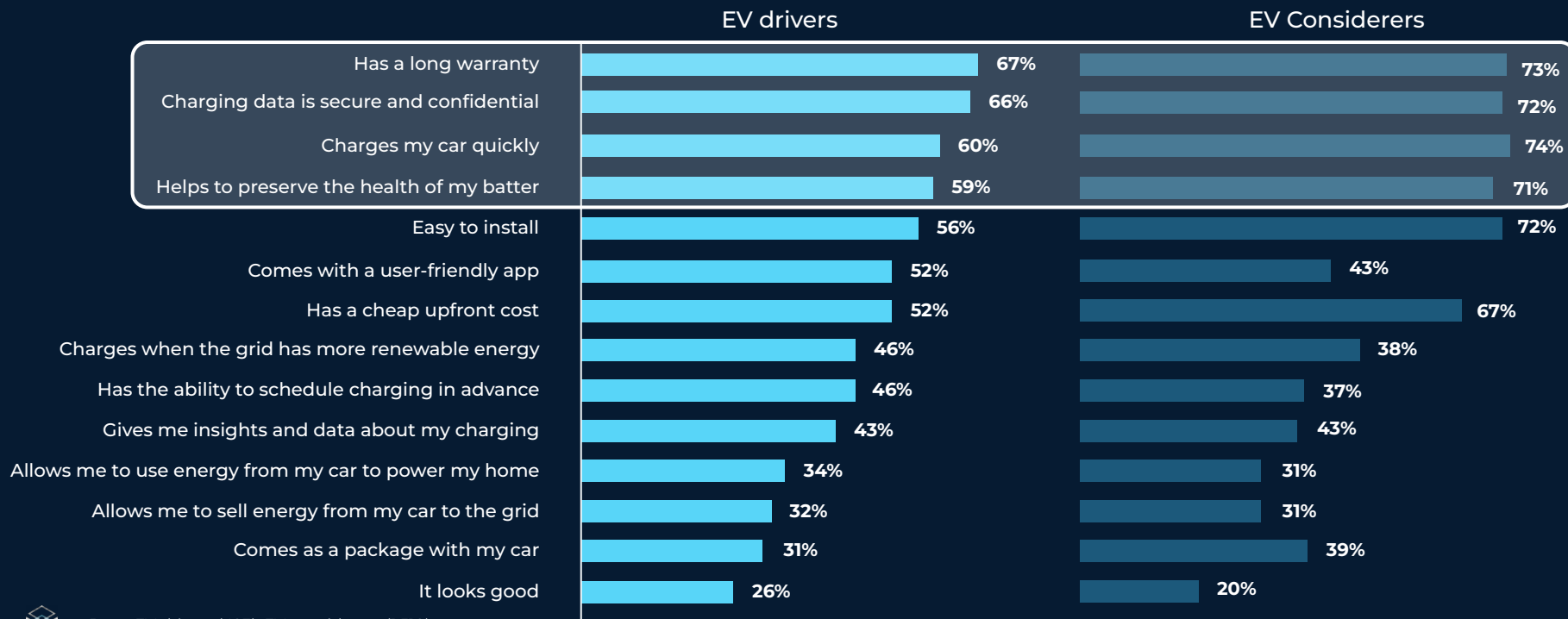
**Cost and value are
a key driver of
charger purchase**



Base: EV drivers (493), EV considerers (1,510)

Drivers will be looking for strong performance and protection from their EV chargers

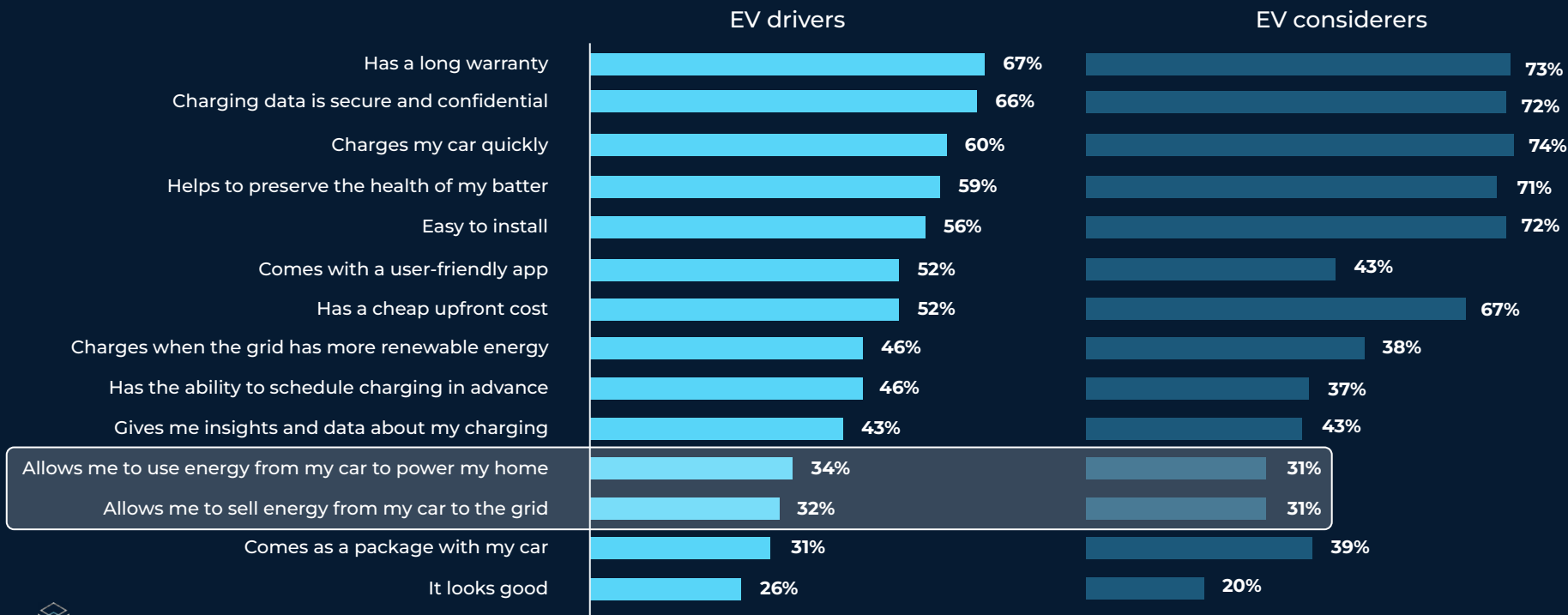
Features considered 'essential' for an EV charger



Base: EV drivers (493), EV considerers (1,510)

The specific benefits of bi-directional charging are not considered essential as yet

Features considered 'essential' for an EV charger



Base: EV drivers (493), EV considerers (1,510)

The appeal of V2X charging – key implications



Positive reaction (not strong)



See some potential benefits



But still fundamental concerns

Value and environmental benefits will resonate but we are going to provide credibility and reassurance around key fundamental needs in cost and performance

How does the audience react to our propositions?



In summary – How does the audience react to our propositions?



There is warmth rather than excitement towards our propositions. It is strongest among regular chargers and those seriously considering a new car.



A separate EV tariff is not a barrier to take up, consumers may prefer this as it gives them more transparency on their EV running costs.



There is strong preference towards a subsidised upfront cost for a V2X charger (choosing to delay their ability to make money).

We showed survey respondents this stimulus

EV driving package

Everything you need to start enjoying your EV - in one simple monthly fee.



One combined 'package' to make the transition to an EV simple

- Electric Vehicle
- 2-way charger (worth £3,000) installed at home
- All the electricity you need to drive around
- Access to public charging
- Annual car servicing and battery health check up
- Fully comprehensive insurance
- Simple app to control your charging

For a small addition to your normal monthly car payments

Add an 8% fee to the cost of the car and take out a standard 3 year PCP contract (longer if you prefer)

At the end of the contract:

- Buy the car or get a new one as normal
- Keep the charger and earn up to £1,000 a year

Bi-directional charger purchase options

Get the latest 2 way charger (worth £3,000)



Choose how much to pay upfront and when you'd like to start earning money

1

Pay nothing upfront - earn money after 3 years

- Use the charger as normal - after 3 years you own the charger and can earn +1000 a year

2

Pay something upfront - earn money later

- Use the charger as normal
- Pay an upfront amount towards the charger and start earning +£300 a year from month 1

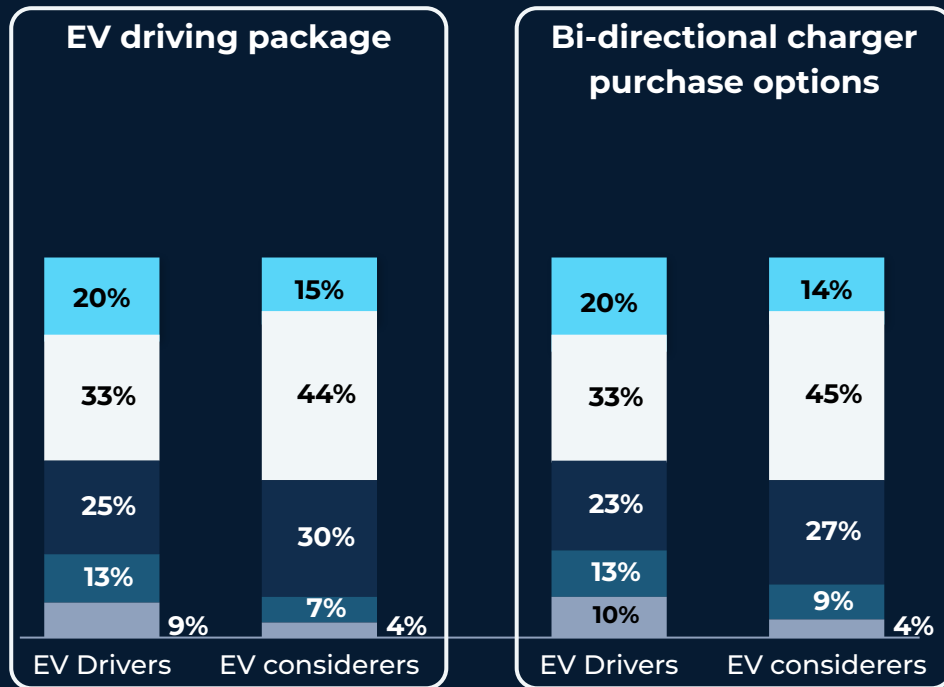
3

Pay £3,000 upfront - earn money immediately

- You own the charger outright
- Earn +£300 a year in energy rebates depending on your plug-in behaviour

There is warmth to our propositions rather than excitement

Likelihood to take up



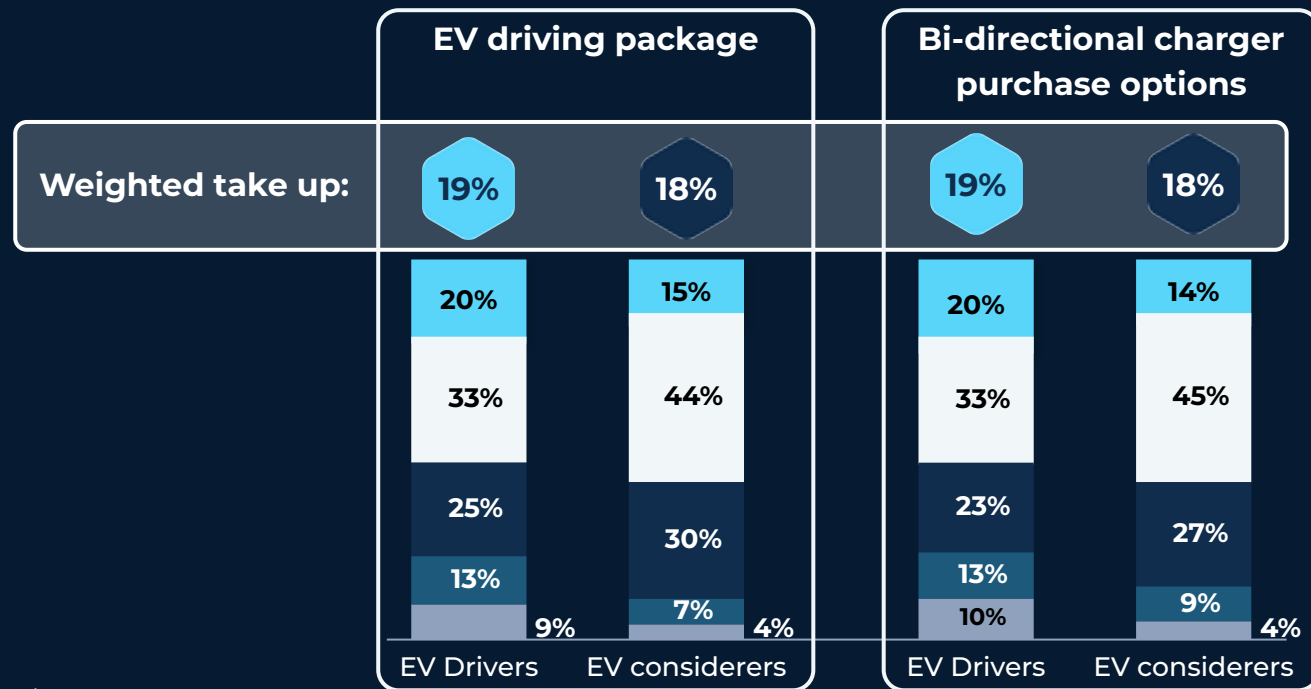
- Very unlikely
- Quite unlikely
- Neither likely nor unlikely
- Quite likely
- Very likely



Base: EV drivers (493), EV considerers (1,510)

The realistic opportunity for our ideas is small but significant at present

Likelihood to take up



We can 'dampen' scores in innovation research to account for human bias to give a more realistic weighted measure

(0.5 x Very Likely, 0.25 x Quite Likely)

- Very unlikely
- Quite unlikely
- Neither likely nor unlikely
- Quite likely
- Very likely

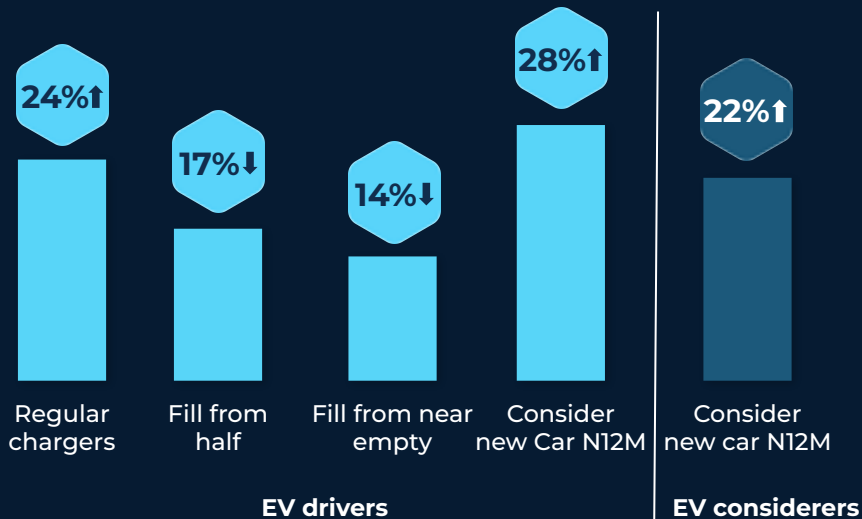


Base: EV drivers (493), EV considerers (1,510)

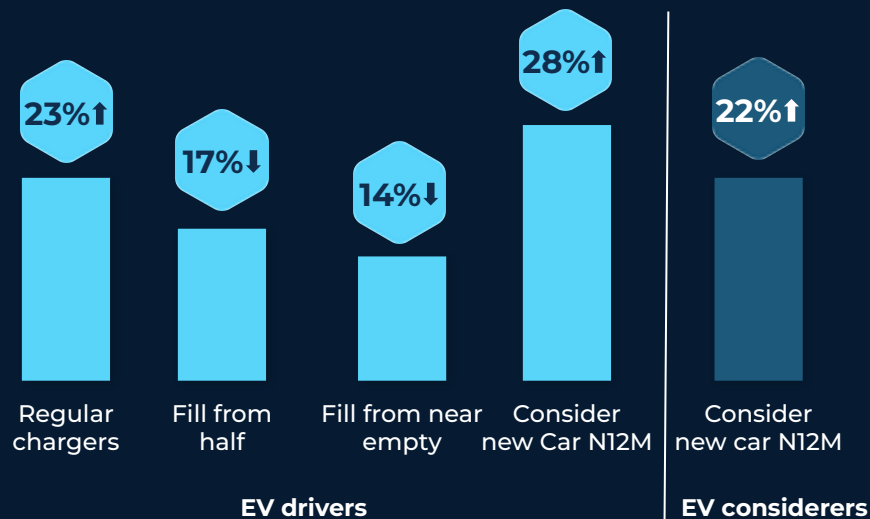
Those considering a new car, and regular chargers are more likely to be interested

Weighted Likelihood to take up

EV driving package

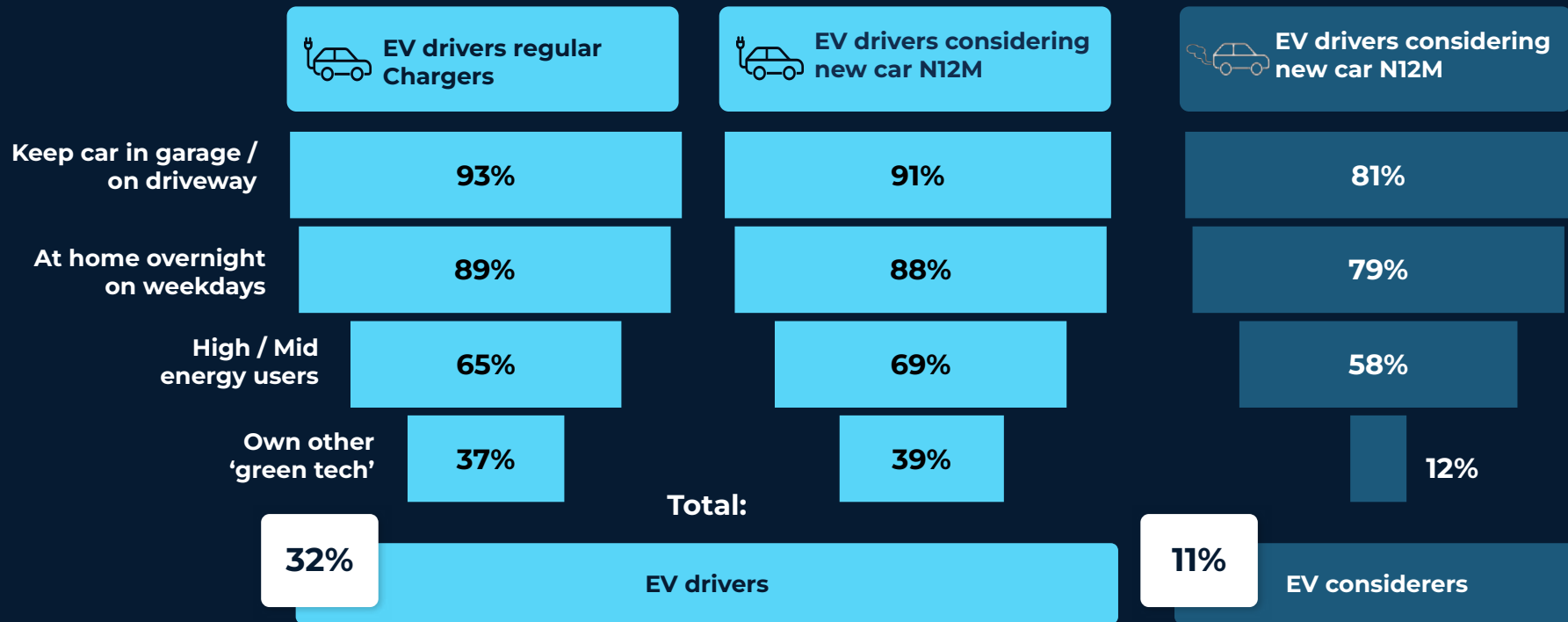


Bi-directional charger purchase options



Base: EV drivers (493), EV considerers (1,510), considering new car N12M (drivers: 176, considerers: 534), regular chargers (212), fill from half (116), fill from empty (160), Low energy (535), mid energy (859), high energy (88)

Our most interested driver groups are slightly more likely to be in our 'prime opportunity'



Other 'green tech' ownership does make our core opportunity slightly more likely to take up

Weighted Likelihood to take up

Opportunity funnel levels

Keep car
in garage /
on driveway

At home
overnight
on weekdays

High / Mid
energy users

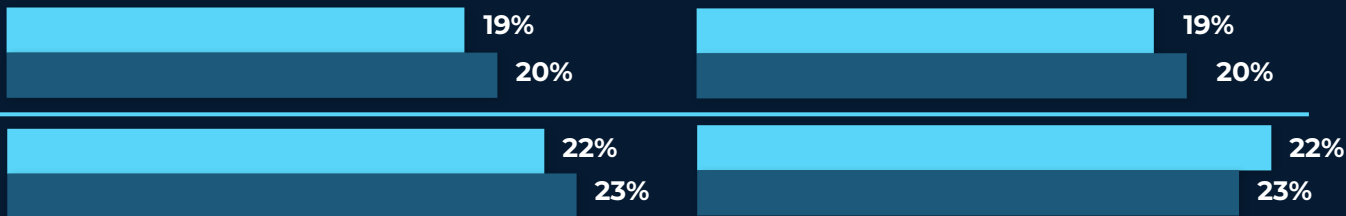
Own other
'green tech'



EV driving package



Bi-directional charger purchase options



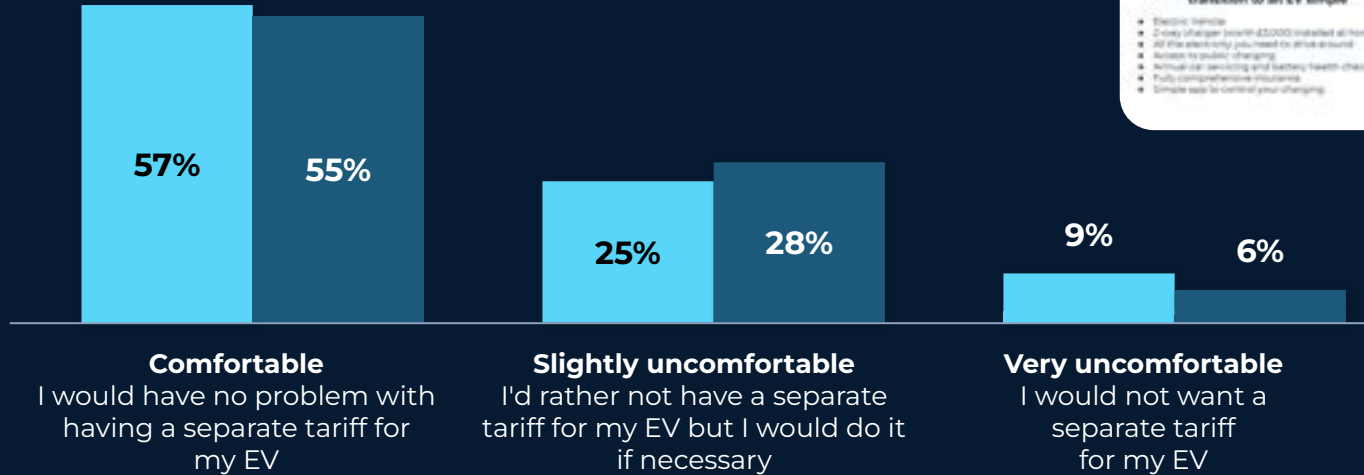
■ EV drivers ■ EV considerers



Base: EV drivers (493), EV considerers (1,510), drivers in high / mid energy funnel level (325), considerers in high / mid energy funnel level (429), drivers in green tech funnel level (158), considerers in green tech funnel level (160)

The majority of consumers are comfortable with having a separate EV tariff, in theory

EV driving package comfort with separate energy tariff for EV



Everything you need to start enjoying your EV - in one simple monthly fee.



One combined 'package' to make the transition to an EV simple

- Electric vehicle
- 2-way charger (worth £3,000 installed at home)
- All the electricity you need to drive around
- Access to public charging
- Annual car servicing and battery health check up
- Fully comprehensive insurance
- Simple app to control your charging

For a small addition to your normal monthly car payments

Add an £10 fee to the cost of the car and take out a standard 3 year RCP contract (longer if you prefer)

At the end of the contract:

- Buy the car or get a new one at normal
- Keep the charger and save up to £3,000 a year

■ EV drivers ■ EV considerers

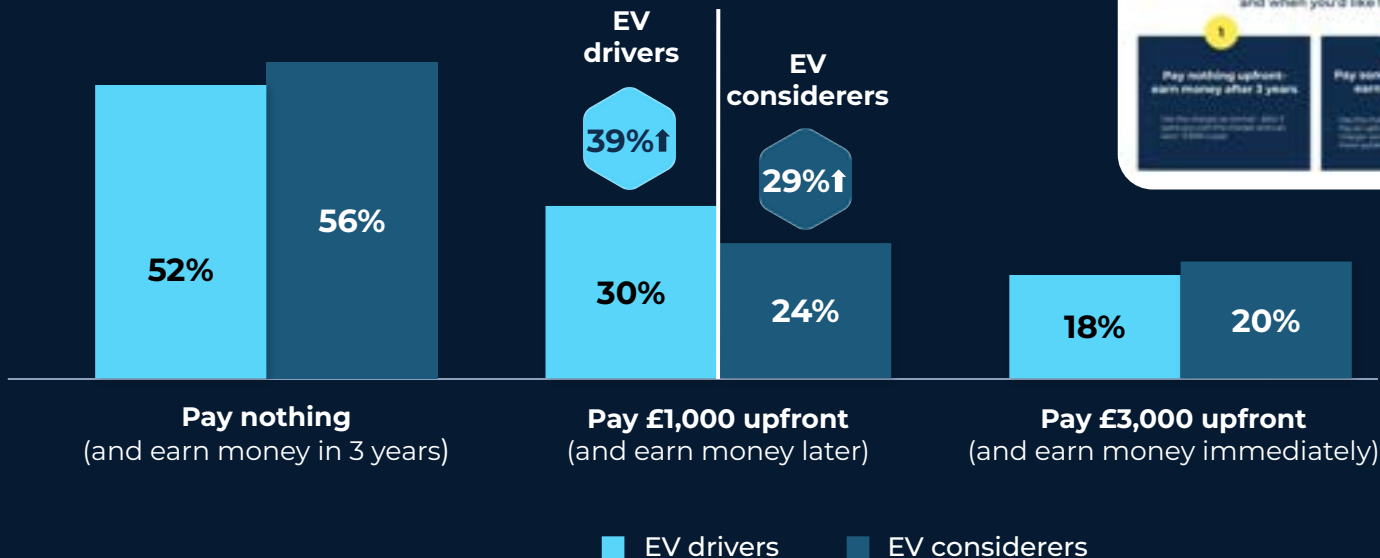


Base: EV drivers (493), EV considerers (1,510)

And most would prefer to delay earning from their V2X charger than paying upfront

Bi-directional purchase options
purchase preference

Considering a new car N12M



Base: EV drivers (493), EV considerers (1,510), considering new car N12M (drivers: 176, considerers: 534)

In summary – How does the audience react to our propositions?



Warmth in core audiences



EV specific tariff appeals



Prefer less upfront cost

Our propositions have appeal but this is driven strongly by the ability to access value and reduce upfront cost. Communicating the value elements of these propositions (more than simplicity or flexibility) will be key to their success.

In summary

If we are to change behaviour and drive V2X, we will need to demonstrate compelling value benefits

There is not an obvious consumer need for V2X yet

There are very few pain points around home charging, with 'value' chargers performing well

...there is more opportunity with new EV drivers

Existing EV drivers have invested in a solution they are happy with and will be hard to switch

...but there are credibility concerns to address

There are concerns around real savings and performance which could be big barriers to take up

We should consider targeting the new generation of EV drivers - providing tangible and credible assurances around performance and value that will allow customers to make an informed 'investment vs benefit' decision.



To find out more, contact us via:
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