KALUZA

Vehicle-to-Everything

Kaluza's findings on customers' attitudes towards bidirectional EV charging

V2X today

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.

In the US, there are 15+ bidirectional-ready EV models announced for launch this year and a growing number of V2X-enabled bidirectional chargers that use the CCS charging standard. And in the UK, this technology is already being used and tested. Kaluza, OVO Energy and Indra ran the world's largest domestic V2X pilot with Nissan Motor Company, and they've now partnered with Volkswagen Group UK on Project INFLEXION to further validate this technology.

What We've Learned

Kaluza's partnership with OVO, Nissan and Indra resulted in 330 vehicle-to-grid (V2G) devices installed across the country and over 3 million free miles made available to customers who exported energy back to the grid during peak times.

This project showed that bidirectional charging has the potential to save $3.7bn (£3.5bn) per year on grid infrastructure reinforcement, and that customers can earn an average of $477 (£420) per year without needing to do anything except keep their cars plugged in when they are not in use.

One of the main challenges with V2X implementation at scale is customer adoption and creating a commercially viable proposition. Project INFLEXION is all about building on the technical success of the previous trial and focuses on developing a sustainable and viable V2X business model that can scale.

World's largest domestic V2G trial

$477/£420
average customer savings per year

93%
customer satisfaction rate

> 3 million
'free' miles driven

2.19 GWh
demand shifted

Potential to
save 10%
in electricity system infrastructure costs

46.8 tonnes
of CO2 saved

INFLEXION

The INFLEXION Project, part of the V2X Innovation Programme, is funded by the Department for Energy Security & Net Zero (DESNZ), delivered by Innovate-UK. Partners include Volkswagen Group UK, OVO Energy, and Indra.

So far, INFLEXION has led us to these two main takeaways:

V2X IS GENERATING VALUE

Our calculations indicate that up to $1,573 (£1,260) of value can be generated per year from V2X. The amount varies depending on a customer's home set up (i.e. if they have solar or not) and whether the customer is exporting energy to the grid (V2G) and/or using their vehicle to power their home (V2H). According to project partner Indra, the current upfront V2G costs are approximately $3,725 (£3,000) including installation, meaning these initial costs can essentially be paid back within three years.

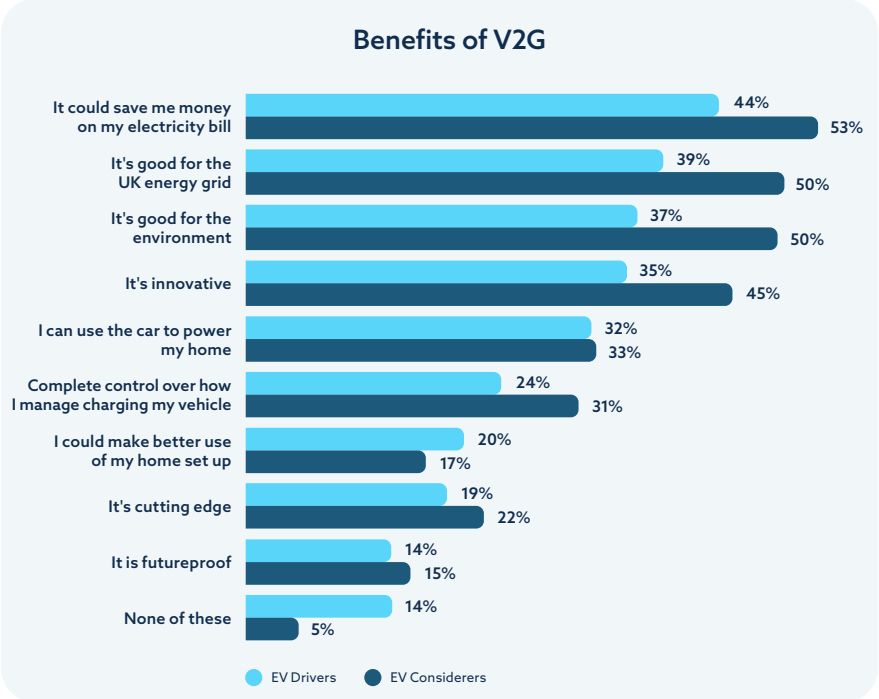
THE EV PURCHASE EXPERIENCE NEEDS SIMPLIFYING

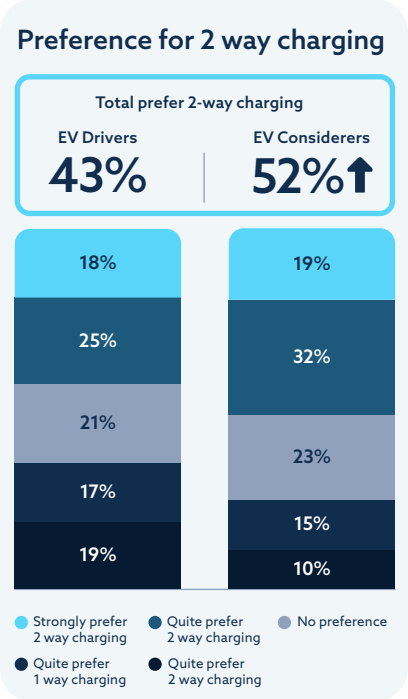
Kaluza's research shows that there are no major barriers to V2X, rather barriers exist with EV ownership, EV purchasing and managed charging adoption. EV drivers are thinking about their home charging set up late in the vehicle purchase journey and often experience research fatigue by the time they have to think about this and whether they want to be on an EV tariff. Driving V2X adoption is as much about overcoming these challenges as the technology itself.

Read on to discover more about how customers feel towards this new technology and how we can accelerate adoption.

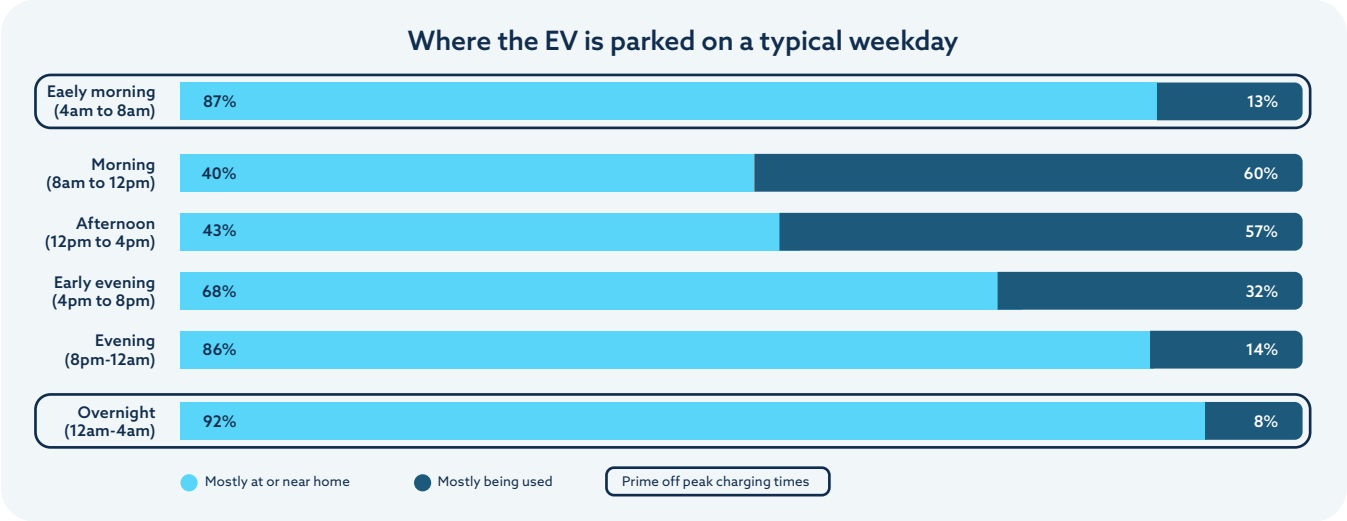
Current Attitudes Towards V2X

In a recent survey by Kaluza, among 2,000 UK customers who either own or are considering buying an EV, we found that over half of EV considerers are interested in bidirectional charging, with the main reason being that it could save them money on their electric bill. Fifty percent also indicated that the main benefits of V2G are that it's good for the energy grid and good for the environment.





The majority of EV drivers have their car parked at home during prime charging times. This presents a phenomenal opportunity to implement V2X and push excess energy back into the home. A typical EV sits parked 90% of the time with a battery capable of storing 40kWh of energy – enough to power an average modern home for two days.



The Challenge

There is still education to be done before customers feel fully confident in V2X technology. Among both groups, 30% are concerned about battery health and 30% are worried about their cars not having enough charge.

30%
concerned about battery health

30%
worried about their cars not having enough charge

However, Kaluza's experience, as well as independent studies, have found that bidirectional charging has no impact on battery health if done correctly. We take into account max charge (which most auto OEMs recommend at 90% for improved battery longevity) and manage charging within those constraints. We also factor in the recommended number of in/out charging cycles per year set by the auto manufacturer.

Kaluza's research has also shown that existing and prospective EV drivers expect to hear about home charging at the point they purchase their car, highlighting the important role auto OEMs will play in driving V2X adoption.

What's Next?

Investing in educating customers about V2X, as well as ensuring auto OEMs and the energy industry work together, are going to be key in addressing misconceptions around this technology and benefiting more EV drivers.

At Kaluza, we look forward to continuing our Project INFLEXION work and research, specifically to discover how this technology can be adopted globally and at scale.

Discover more at kaluza.com

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