Taming the EV Charging 'Wild West'

It's time to put user experience at the centre of electric vehicle charging

Paythru

Paythru would like to thank the following for agreeing to be interviewed for this report, as well as the many other industry professionals who have shared their views on the user experience of payments with us over the past year.

- **Olly Craughan**, Head of Sustainability at DPDgroup UK
- **Niall Riddell**, CEO of Paua
- **Carl Buckingham**, Business Development Director; and **Julia Meek**, Director of Business Development and Marketing at Zenobe Energy
- **Ian Johnston**, Chief Executive Officer, Osprey Charging Network

INTRODUCTION

Mass EV uptake depends on a better charging experience

EV charging infrastructure has been built around scale rather than user experience. The understandable focus has been 'get them in the ground' to meet demand, but sometimes this rush has meant overlooking the user. As a result, charging can be frustrating.

Modern consumers expect pain-free user experiences – from banking to shopping to ordering takeaway – built around their needs. Drivers are no different. They want pain-free journeys. They want to find a place to park and charge, turn up, know it will be available, know it will work, and understand exactly what they are paying for.

This is even more important for professional drivers. The pandemic led to an explosion of last-mile delivery drivers – some in corporate fleets, some in privately owned vehicles. Many take advantage of the low running costs of EVs, though many still find charging cumbersome. To make this work for them – and so accelerate the EV transition amongst this group of intensive drivers – they need to be able to charge at optimal times and pay in a way that is easy for them and can be easily billed back to their employer and reconciled for tax purposes.

Whilst ensuring enough chargepoints remains an issue, it is one that has received a lot of attention and investment. Less discussed, but nearly as important is useability.

Ian Johnston, Chief Executive Officer, Osprey Charging Network, says "There are some really great examples of charging infrastructure out there, but also a lot of bad ones. So as a new user, you've probably got about a 50/50 chance of a good experience. Things are getting better, but the current situation is just not good enough to support widespread EV adoption".

As we move beyond early adopters – a group willing to tolerate some inconvenience in order to access cutting-edge technology – user experience will be the next big barrier to EV uptake.

This paper discusses the challenges and solutions to the 'user experience problem', drawing on a series of expert interviews and new proprietary research which we commissioned via YouGov.

SECTION 1

The challenges

There are several challenges presented by current charging infrastructure that make it cumbersome to use and put people off switching to EVs.

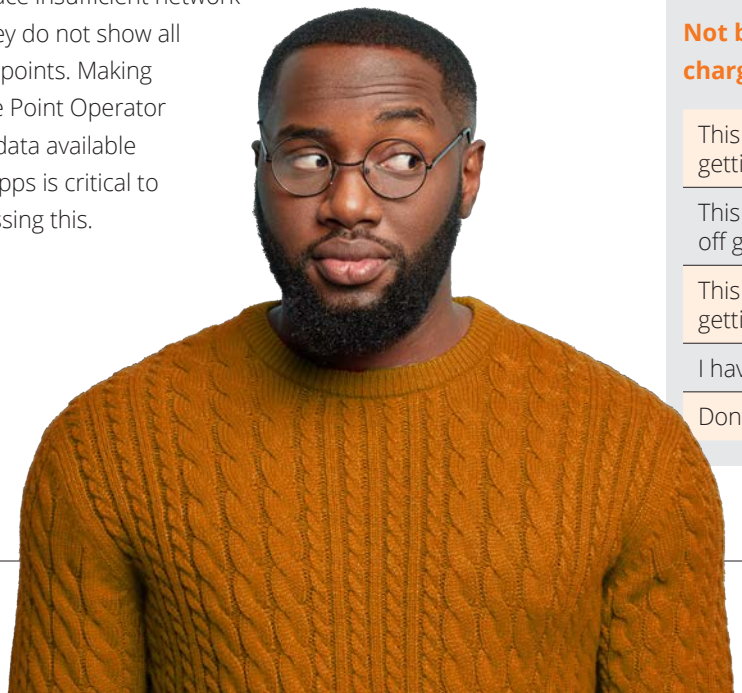
"EVs make up just 1.4%[1] of vehicles on UK roads. That is very early on the adoption curve," says Niall Riddell, CEO of Paua (see chart). "We are barely into early adopters, let alone the average driver. We cannot assume that the remaining drivers will buy for the same reasons. They will not accept the trade-offs early adopters will. They will only switch if doing so makes their life easier. That means we need to make the charging experience as easy as possible"

In this section, we discuss the useability (as opposed to availability) concerns that are regularly raised by EV drivers, and often as reasons for not switching to EVs. To understand the scale of these issues, we surveyed 2,042 British drivers, of which 1,975 were non-EV drivers and 67 were EV drivers, to understand how much these worried them.

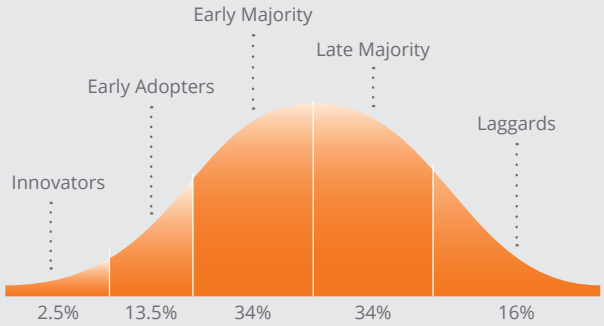
Network availability

In our research, the biggest concern among current non-EV drivers was 'Not being able to easily find an electric vehicle charging point when needed'. A massive 54% said would put them off and 26% said it might. Just 9% said this does not worry them (the rest didn't know or had not heard of the problem). Amongst EV drivers (albeit from a small sample size of 67) 62% said this was a big or moderate issue and 38% a minor issue, or not an issue at all.

Charge points are becoming more available. But they are not always findable. Unless drivers have a regular charger, they usually use an app to find their nearest one. If the charger or its network isn't signed up to the app they use, they won't know it's there. Many apps face insufficient network – ie they do not show all chargepoints. Making Charge Point Operator (CPO) data available to all apps is critical to addressing this.



Innovation adoption Lifecycle

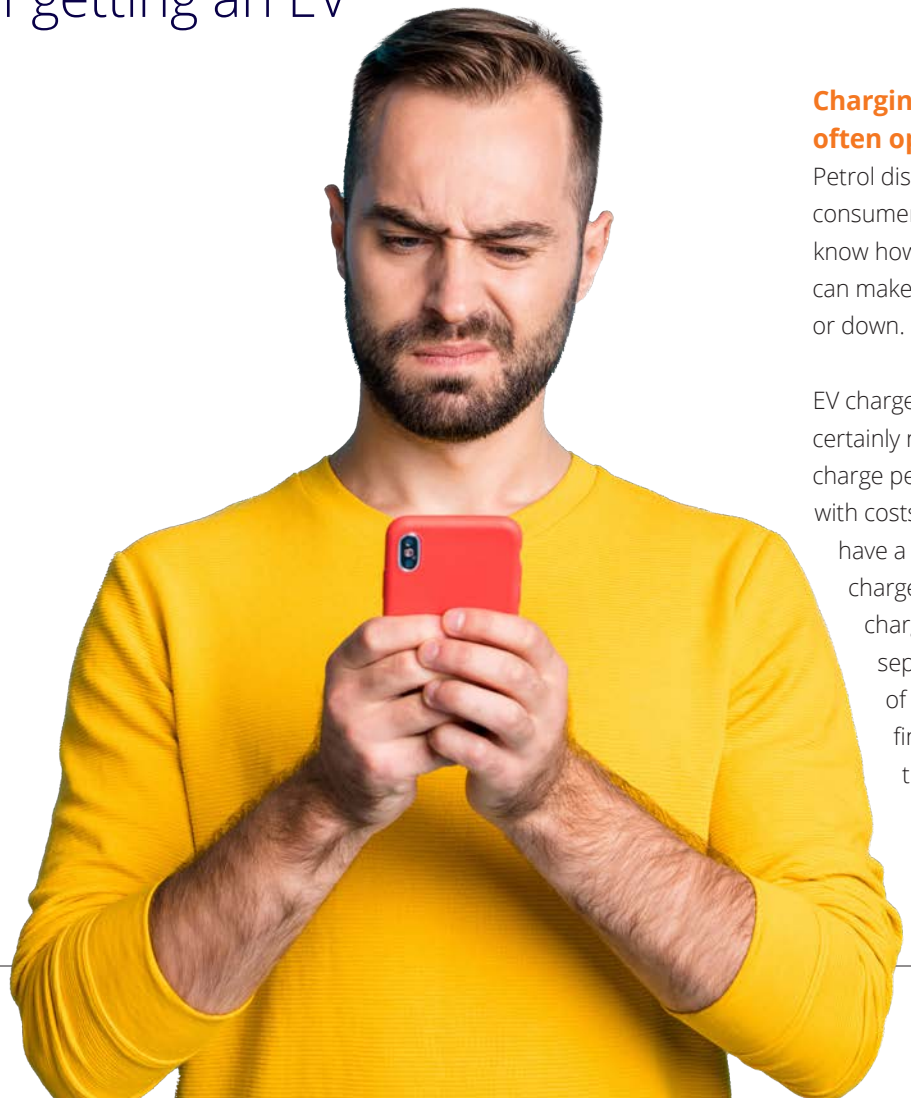


Not being able to easily find an electric vehicle charging point when needed (non-EV drivers)

This would worry me and put me off getting an EV	**54%**
This would worry me and might put me off getting an EV	**26%**
This would not worry me or put me off getting an EV	**9%**
I have never heard of this problem	**2%**
Don't know	**9%**

[1] c38million cars on the roads, of which c540,000 battery electric vehicles, as of July 2022 https://www.nextgreencar.com/electric-cars/statistics

Nearly a third of non-EV drivers, 31%, said having to download different apps to access electric vehicle charging points would put them off getting an EV



Charging costs are complicated and often opaque

Petrol displays a price per litre, which most consumers can get a rough sense of – they know how many litres their car needs and can make rough calculations as prices go up or down.

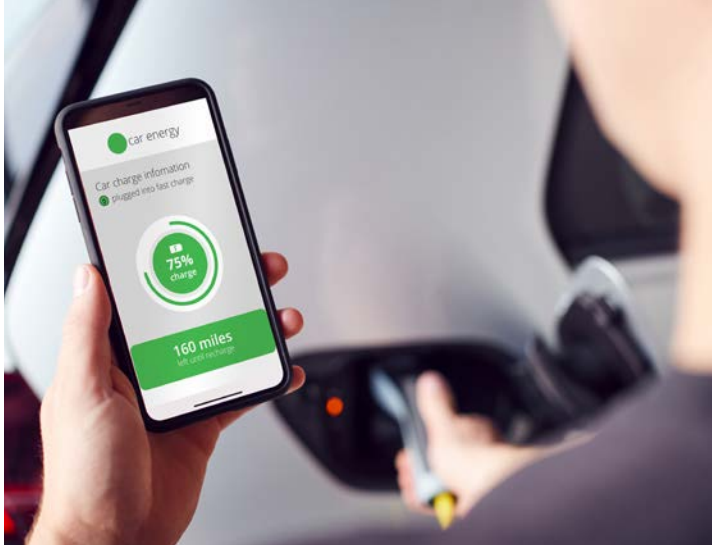
EV chargers rarely have a unit price and certainly not a standard approach. Some charge per kilowatt hour, others by time – with costs varying by chargepoint. Some have a connection fee, or a minimum charge. Some have time limits and charge if you overstay. Some have separate charges for parking (stories of aggrieved EV owners receiving fines because they did not realise that they needed both have hit national headlines). This amounts to thousands of tariffs.

Our research found 25% of non-EV drivers said the challenge of understanding and comparing different payment tariffs for charging electric vehicles would put them off buying an EV, and 31% said it might.

Additionally, 27% said understanding the additional fees and rules associated with electric vehicles (e.g. parking tickets, charge overstays etc.) was an annoyance that would put them off, and another 27% might put them off. Just 20% said this did not worry them.

Too many apps

There are over 80 charging networks across the UK all with their own apps and subscriptions, not to mention third-party apps from car parks, vehicle manufacturers and aggregators. Some car parks offer both a parking app and an EV charging app. This



is frustrating for consumers who have to download multiple apps and sign up to lots of schemes just so they can charge their car in a variety of spots.

Nearly a third of non-EV drivers, 31%, said having to download different apps to access electric vehicle charging points would put them off getting an EV and 23% said it might. Only 26% said this would not worry them

Not enough other payment options

Whilst there are plenty of apps to choose from, often useful options are lacking. Not all chargepoints have credit card readers for example. None accept cash, despite the fact that cash is preferred for parking for older and low-income families[2] who will be particularly hard to win over to EVs unless easy payment options are available.

Ian Johnston of Osprey says: "For all the talk of apps, most of our transactions are via bank card from users who just turn up, tap and pay. Users vote with their feet and if there is a hurdle to payment they will go elsewhere. Those networks that force customers to use apps are at bottom of the table of customer preference. The strategic view should be to welcome customers, not to put up barriers to paying. The best networks offer private memberships, fleet roaming schemes, and card payments."

Johnston also notes that apps are valuable to operators because they gather data and build a dialogue with customers. But, he says, rather than being mandated, they need to entice users with something special, such as member benefits.

Problems during charging (and no one around to fix them)

Things can wrong. Charging cables get stuck. Charging won't start or stop. Payments won't go through.

Eliminating 100% of problems is impossible, but when they happen, there needs to be someone available – either in person or on the phone – who can resolve them. People will tolerate the occasional problem if it can be quickly resolved by a friendly human. But they will get angry at a machine that does not work.

A high 38% said that 'not having someone available if there is a problem with the charging point or payment' worried them and put them off getting an EV, and another 31% said it might. Perhaps unsurprisingly this was a little lower for younger and more affluent drivers, and higher for older and poorer ones.

Across the five issues included in our survey, just 8-12% said they had not heard of each problem, indicating a high awareness of these challenges, with the majority indicating these useability issues would or might put them off getting an EV.

This paints a picture of a population at large in which around 10-20% are not concerned about these challenges and will probably get an EV when the time is right. For the rest, around a third see these user experience issues as a major disincentive to buying an EV, and another third are at least somewhat deterred by these issues.

[2] https://www.yourmoney.com/household-bills/cash-is-top-choice-for-parking-payments/

Additional challenges for fleets and fleet managers

Professional drivers are increasingly switching to EVs – a move that will have an outsized impact on emissions reductions and could act as a trailblazer for the wider population.

"The much talked of 'range anxiety' isn't a problem anymore, if vehicles are deployed correctly" says Olly Craughan, Head of Sustainability at DPDgroup UK. "Our vehicles last more than a day on a full charge, and the idea that delivery drivers are having to time out to charge twice a day is incorrect. And the fuel and maintenance costs are cheaper for everyone, although increased energy costs are starting to erode some of these savings. As long as drivers have a regular, reliable place to charge once every day or two – and they know it will work – the transition to electric fleets can be smooth."

But despite this optimism, many professional drivers complain about charging and reject EVs or resent being forced to use them. Giving them reliable places to charge and a smooth experience at the charger is key.

All the above challenges are relevant to fleet drivers, who use much of the same infrastructure. But in addition they face the following challenges.

Getting a receipt

This is a major and rarely discussed issue. Many private drivers need to bill their charge back to their employer, or for their tax return. "No chargepoints issues a receipt. Yes you can get one after the fact but only after a lot of hassle", says Niall Riddell of Paua.

Sometimes that means using the company scheme app or card. However, if the driver needs their own receipt to reclaim expenses, or if the card reader or company card is not working and they need to use their own card or app, this creates complexity. Chargepoints often do not issue receipts. They are usually unattended. You may be required to call someone or visit a website or sign up to yet another scheme to access your EV charging receipt.

Clear data on charging

Fleet managers want granular data on how their drivers are charging so they can monitor costs, ensure billing is correctly allocated and make recommendations to optimise their fleets. This means ensuring charge data is fed into the fleet's backend IT systems in a way that makes it comparable between chargers and easy to dig into.

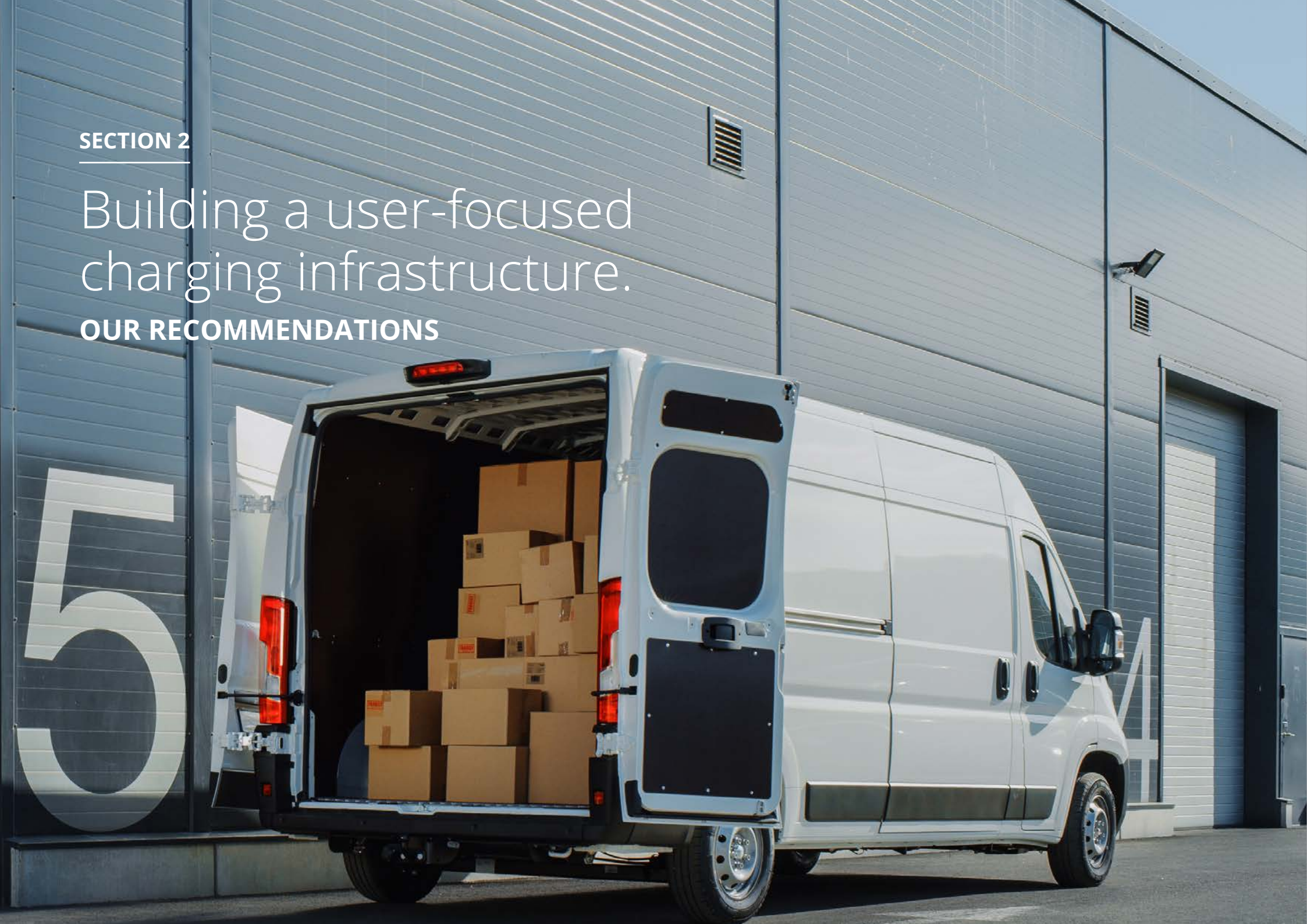
Creating dedicated fleet charging hubs

Sharing with the public can sometimes be frustrating, as there is no guarantee a preferred charger will be free when you want it. Equally private EV drivers sometimes complain if fleets are in charge points, and sometimes the council response can be short-sighted – DPD tells the story of one that announced a site as 'car charging only' without notice, causing problems for professional drivers. Whilst public infrastructure will always be part of the mix, having dedicated spaces for fleets to charge in convenient places would provide a better experience and smooth their electrification journey.

Why all this matters for CPOs

All of the above problems can lead to lost business. If people can't find your charge point, start a charge, or pay for it, then they drive away. If they start a charge and then run into problems, they call the help desk if they, blocking the charger, placing demand on your resources, and sometimes ending up with a free charge. If they arrive expecting one price and find hidden charges, they get annoyed. In all cases, they feel frustrated and avoid your chargepoints in future.

On the other hand, "drivers develop loyalty to a charger based on a smooth experience in the past" says Niall Riddell of Paua. Most chargepoint business models rely on securing an average number of charges per day over a long period. A good experience is the best way to secure regular repeat business.



SECTION 2

Building a user-focused charging infrastructure.

OUR RECOMMENDATIONS

The UK Competition and Markets Authority (CMA) recently recommended that "charging must be simple and quick to pay for – e.g. people don't need to sign up and contactless payments are widely available" [3]

To serve both consumers and fleets, charging needs to overcome the above challenges. Some of these are technical, others will need to be done in collaboration between CPOs, councils, private car parks, and fleet managers.

We conclude this report with some practical recommendations based on industry conversations, to put the user at the centre of charging and ensure a smooth user journey that encourages repeat business from existing drivers and makes the decision to switch easy for future EV drivers.

These represent a holistic approach to improving the user experience at the charger and go beyond what we at Paythru can solve alone, but we hope they will prompt conversations with CPOs and other stakeholders to help us solve the problem collaboratively.

Clearer tariffs

Ideally all chargers should charge by kilowatt hour (kWh). Faster ones will cost more per kWh, slower ones less. Any time limits or additional fees on top of that should be made clear. As much as possible we need to create a 'pump' price – a single fee per unit – delivered via the app or chargepoint display. It is impossible to give a single cost per unit since fast charging will always be more expensive than slow, there will be local variations, but if chargepoints provide reliable real-time data, that can be combined with users' preference in apps to help users work out the best option.

Combine multi-party fees

Any additional fees (such as parking) should be clearly indicated at the point of paying for charging and wrapped into a single transaction so the customer is clear about what they are paying for and cannot miss anything. Pricing for parking beyond the charging period – if available – should be clear and bookable. Where these are handled by multiple parties, that payment complexity should be handled behind the scenes and the payment platform should ensure they are correctly split, so the user has a single transparent transaction.

[3] https://www.gov.uk/government/news/further-action-needed-on-ev-charging-to-meet-net-zero

Interoperability between CPOs

We are probably not going to get rid of the breadth of charging schemes, but we can make them simpler.

A solution is interoperability, whereby chargepoint operators let each other integrate and take a fee. Schemes like Paua and Zap-Map are starting to solve this through multi-brand cards, but others could get on board to make the user experience better.

So, for example, a user of CPO A's payment scheme can use their card or app with CPO B's chargers, on CPO B's terms, but CPO A gets a small cut. Both companies generate revenue they may have otherwise lost to someone else, and the user experience is far simpler. This could also be led by vehicle owners who negotiate deals with CPOs and give their drivers a single card. In all cases, the way to do this is through cloud platforms which set up multilateral agreements and manage payments between parties.

Better quality apps

Too many apps still don't work well enough. They need to be more robustly designed from the UX to the data management, to communications protocols with the charger, to the payment processing. They need to load up, locate the user, and connect to the charger quickly.

More payment options

Expand credit or debit card readers to allow instant payments without going through an app. Most new charge points now offer this.

Another option – and a solution for the thousands of older CP models where card readers are hard to retrofit – is a QR code on the charger that directs to a payment site. Enter the charger code and your desired charge, see the price, hit accept and start your charge. These could be built to integrate into the existing payment infrastructure and allow people to turn up and charge without the app.

If all else fails, there should be a number to call and a simple way to pay, where a human operator can see the charge details on their screen and take card details to process the payment quickly.

Accept cash

Cash payments are challenging with existing EV infrastructure but could be done via existing parking payment terminals (at least the newer ones). With some backend integration, the payment calculation could be displayed via the terminal, and a payment made in cash.

A big idea fleet electrification

In its recent report, CPO Connected Kerb proposed a big idea: electrify the NHS. It suggested rolling out mass charging in NHS's half a million parking spaces, which could be used by its fleets, staff, and visitors. Then use the NHS company car scheme to encourage EV uptake, including guaranteed and subsidised workplace charging.

This is a great idea. It also a great example of the challenges of payments in complex systems.

Connected Kerb propose different business models for such a scheme, including run privately for profit, or run by a charge point contractor who answers to the NHS. Each case offers the opportunity for revenue sharing between the NHS and the operator. They also discuss the possibility of different charging rates for NHS drivers, NHS employees, and visitors.

All of this creates payment complexity. One party could collect everything and pay it out, but that could be complex and time consuming, especially for an organisation like the NHS which has higher priorities than moving money around. It would be easier to set up a payment platform that automatically recognises who is charging (eg by the card they are issued with), charges them accordingly, and splits the payment at the point of transaction.

That makes it smoother for the user, but also streamlines the behind-the-scenes process for all parties involved and ensures everyone gets their share immediately.

Make receipts easy to access

Create easy ways to get receipts. For normal operations, charging schemes can be set up to send them automatically to the right place. When the normal payment scheme doesn't work, drivers should be able to enter an identifier, or an email, via an app, website, machine or phone call, to have their receipt emailed to them or their employer.

Support non-CPO operators

Not all charge points need to be run by CPOs. They could be run by car parks, councils, landowners, or fleet operators. Such operations should avoid yet another app and instead use the above options or existing parking payments infrastructure. Payments made by these methods are then allocated to the right department (parking, charging, fleet etc) and split with the CPO or other stakeholders in the venture, as agreed.

Create multi-use charging hubs for fleets

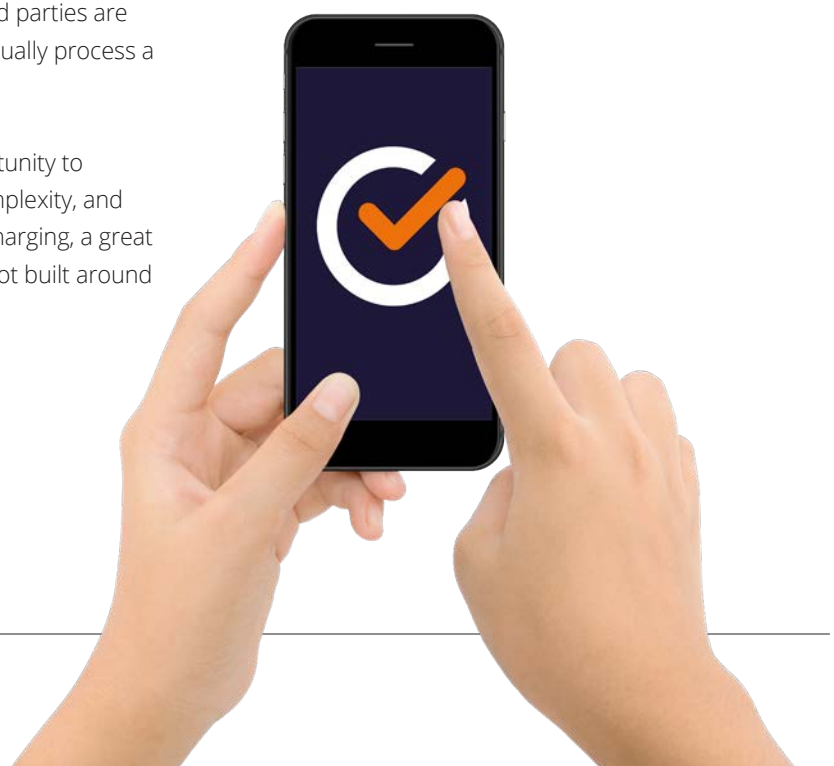
Since the charging needs of a fleet is fairly predictable, that creates an opportunity for private charging hubs for commercial vehicles – for example on depots, industrial estates or car parks. This would support the fleet transition and help optimise costs for fleets and revenue for landowners.

This makes most sense where infrastructure can be shared. "Many fleet operators or owners of car parking space are installing charging infrastructure at their sites," says Carl Buckingham, Business Development Director at Zenobe, "but they are underutilised as they usually serve one group that is charging at the same time. It would benefit everyone if chargers that are used to charge a fleet overnight could be utilised by taxis or other commercial drivers in the day."

In such a situation, user experience and payment terms need to be carefully designed. The fleet manager may want to negotiate one rate for their night-time charging. A taxi fleet may have a preferential rate for its drivers (and perhaps even combined offers – 'lunch and charge'?). Ad hoc users may have different rates. Drivers may want to access it via existing payment schemes to avoid another app.

This creates lots of complexity behind the scenes – requiring that multiple users with their own payment terms are charged correctly, owners operators, and third parties are paid correctly, and there is a helpdesk to manually process a payment if things go wrong.

Shared private infrastructure is a great opportunity to support fleet electrification. But given the complexity, and the track record of poor user experience in charging, a great idea would be undermined if the solution is not built around the user.



Paythru is a highly customisable payment gateway built specifically around the complex needs of EV charging.

How Paythru can help

Our cloud platform sits in between chargepoints and operators and orchestrates multi party payments so that the user gets a single transparent transaction. For example, where a user needs to pay for a parking ticket and a charge, the two companies set their payment terms in the cloud, and the user is provided with one transaction to pay for everything. We manage the payment split and make sure the right people get paid.

The technology also allows peer-to-peer, multi-party integration. So one charging network could set up payment-sharing agreements that allow its users to access other charging networks, with commission handled behind the scenes.

This can all be integrated via APIs into a parking or EV charging apps (or any app that offers EV charging), as well as into websites or physical payment terminals – joining up disparate payment technologies via a single platform.

We can also build white labelled front end platforms (apps, dynamic websites, etc) to allow new ways to pay, as well as access to other services through partners including chargepoint location and parking enforcement.

Find out more

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