Overcoming Payment Anxiety in EV Charging

Insights for Charge Point Operators

A report by Paythru

Paythru

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We would also like to thank the following for contributing their insight to this report, and The EV Café for their support gathering responses to our survey.

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Foreword

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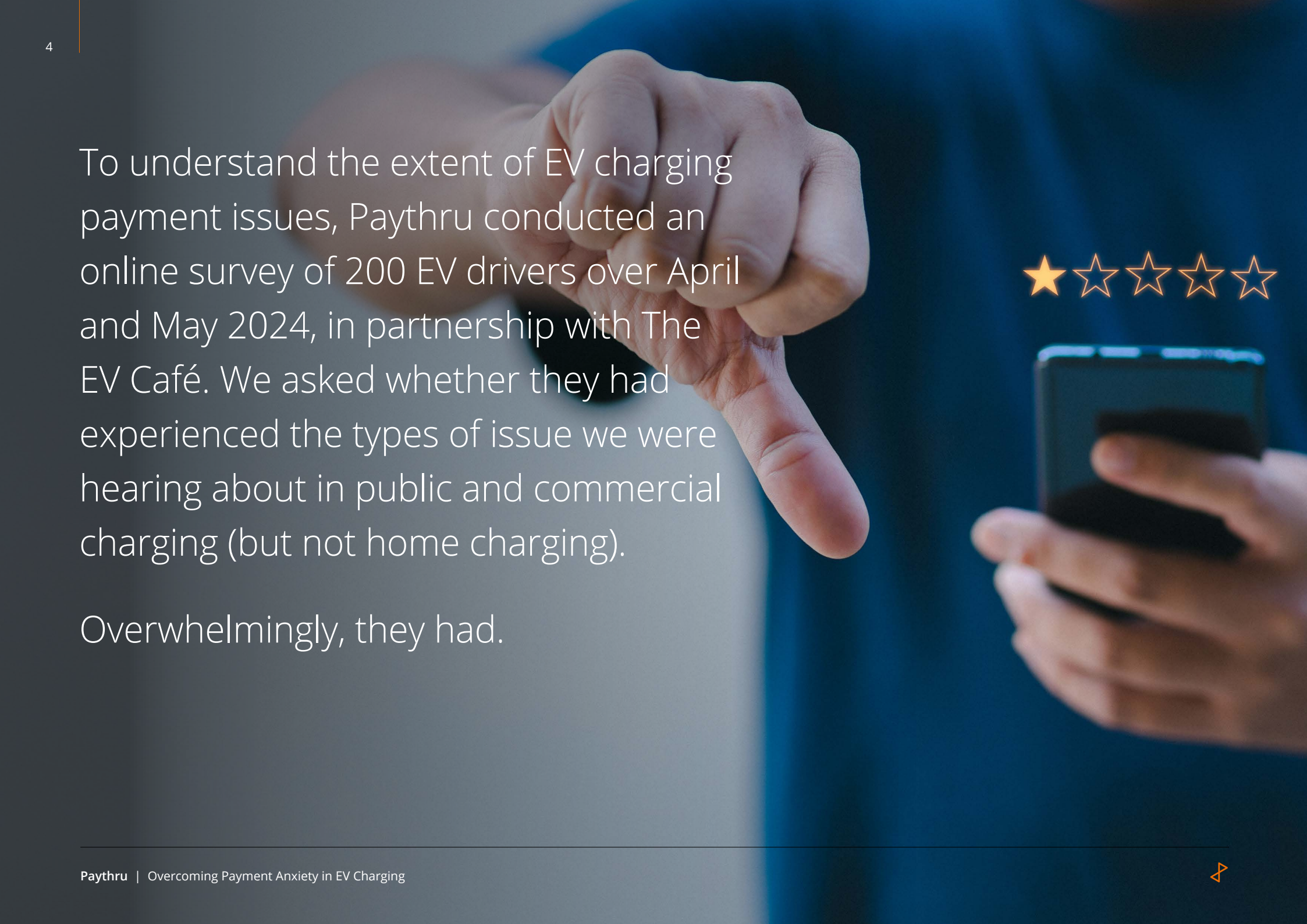
The UK EV industry is entering a critical phase in its development. As EVs become more affordable, charging infrastructure spreads, and fleets are renewed with EVs – we are approaching the tipping point where we move from early adopters to mainstream EV uptake.

There are now over 1.7 million plug-in cars on UK roads (of 41m vehicles in total). Much praise for that must go to the continued improvement in the EV charging experience. As people buy EVs, or know people who have, concerns about whether they'll be able to find a charger or end up stranded with no charge are fading.

But that does not mean all problems have been solved. There are still lots of issues with the experience at the charger that upset EV drivers and put off those who might switch.

As we move from early adopters to early majority, expectations will rise. People used to smooth transactions – at petrol pumps, shopping online, or buying lunch on an aeroplane at 30,000 feet – will have little patience for complex and cumbersome EV charging transactions. They will want everything to be slick and frictionless.

From our ongoing conversations, it's clear this desire is not yet matched by reality. The charging experience remains overly complicated, creating what we call 'Payment Anxiety': the feeling of going to charge and knowing that there is a very real chance – even if a small one – that the charge point won't work the way you want for one reason or another.



To understand the extent of EV charging payment issues, Paythru conducted an online survey of 200 EV drivers over April and May 2024, in partnership with The EV Café. We asked whether they had experienced the types of issue we were hearing about in public and commercial charging (but not home charging).

Overwhelmingly, they had.

Our survey was not exhaustive but delved into some specific issues that had been raised as concerns. The top level findings – which are explored in detail in this report, along with proposed solutions – were:

1. Users are happy to accept flexible and even dynamic pricing where there is a good reason for it, but only if it is clearly communicated and they know exactly what they are paying and why.

2. Users still pay in lots of different ways at different chargers, despite the often-stated preference for a single solution.

3. Users face lots of frustrating issues at the charge point that hamper their ability to charge, including cards being rejected, having to download or update apps, lack of mobile connectivity to do so, and payments not going through.

4. The current approach to pre-authorisation of payments is a major irritation.

Payment Anxiety
Four challenges and solutions

CHALLENGE

One

What will I be charged?

Payment anxiety can start when drivers begin looking for a charger. Costs can vary significantly depending on the charger type, location, time of day (i.e., peak vs off peak electricity), and providers' policies. Drivers are often confused and overwhelmed.

To add complications, some charge point operators (CPOs) are taking an interest in dynamic pricing, where prices can adjust in real-time based on demand. On the whole, users seem to accept price variations as long as they are fair and transparent. In fact, 75% of our respondents supported dynamic pricing where it supports better use of the charger, e.g., reducing queues, and/or creating more sustainable energy use.

Whatever the pricing mechanism, prices need to be clear and transparent. "Dynamic charging would mean prices change regularly; that could foster mistrust if people see one price in an app but pay a different one when they arrive" says Gary Comerford, Host of The EV Musings Podcast. When searching for a charger with an app, our respondents expected kWh rates to be displayed (97% said this was essential or important); clear upper price caps (93%) and they would ideally like the ability to lock in a rate so there were no sudden surprises when they got there (75%).

Which of the following do you agree with?

	STATEMENT	PERCENTAGE	
SUPPORT	Charge points should use dynamic pricing where it supports better use of the charger, e.g., reducing queues, incentivising use at quiet times	8%	75%
	Charge points should use dynamic pricing where it helps make the electricity grid more energy efficient	7%	
	Charge points should do both of the above	60%	
OPPOSE	Charge points should have one fixed rate and not use dynamic charging	25%	25%

If chargers operate dynamic pricing, how important are the following?

FEATURE	ESSENTIAL (%)	IMPORTANT (%)	NOT IMPORTANT (%)
Live kWh rates displayed prominently in EV apps	69%	28%	3%
Pre-authorisation charge displayed in EV apps	57%	32%	11%
Clearly displayed upper and lower price caps on charger/in apps	58%	35%	6%
Ability to lock in a rate through an app when searching for a charger	24%	52%	25%
Ability to filter search results by real-time price	45%	44%	11%

Potential solutions

Be clear on flexible pricing: Where prices change predictably, i.e. switch tariffs at a certain time, this should be easy to address. Apps, and charge points themselves, should clearly display pricing of different chargers to allow comparisons and let the user make an informed choice, and alert users to impending changes based on their distance from the charger or planned arrival time.

The Public Charge Point Regulations 2023, which mandate price transparency, will partly solve the issue. But the problem remains that many AC chargers have no display so the only way to get pricing is via an app, which defeats the point of having contactless. This can be solved by separate kiosks linked to groups of chargers, which can provide a place to display live kWh prices and drivers' energy consumption, via a user-friendly digital display (more on this in the next section).

Be even clearer on dynamic charging: Dynamic charging is trickier. "The challenge will be how to communicate it – it can be hard to understand and people like certainty", says Phil Shadbolt OBE, Founder and CEO of EZ-Charge.

Clear real-time information on the current rate on the app, and on the charge point's digital display, is especially critical for companies using dynamic pricing. And pricing must not change once the charge starts – as required by the Public Charge Point Regulations.

Dynamic charging presents more of a problem when searching via an app, since the charge may vary by the time the driver arrives. "Bookable charge points that lock in a price for the booked time – calculated by the CPO's pricing algorithm – could offer a solution" says Paul Kirby, eLCV Expert at EV Essentials, "and this would also solve other problems, such as helping busy fleet drivers manage their time. That would need some careful backend integration – a financial handshake on booking that reserves the charger at a specific time and price, but also take a minimum fee to protect the CPO in the event of the driver not turning up."

Frame discounts and surcharges positively: A final point to consider is how to frame flexible or dynamic pricing. A good option is to set a 'standard price' and present everything else as a discount, rather than a surcharge.

When credit cards first became popular, merchants wanted to charge different prices to cover the card fee. Credit card companies pushed merchants to offer a discount for cash, rather than a charge for using a credit card. As Nobel Prize winning Economist Daniel Kahneman notes in *Thinking, Fast and Slow* this 'framing' was important, as people more readily forgo a discount than pay a surcharge.

More recently US burger chain, Wendys, found out the hard way that the idea of surge pricing was not popular, and had to backtrack. Had they simply increased prices and offered discounts at quieter times, they may have avoided a backlash.

CHALLENGE

Two

Will my preferred payment method be accepted?

The next worry comes when drivers arrive at the charge point and face the famous 'too many apps' problem. Will their preferred method work? Or will they have to work out another approach?

Unsurprisingly to readers of our previous reports, we found a wide range of payment methods used. What is striking is the variation. Only 13% of respondents had a single option they used 100% of the time. Most had three or more regular options (e.g., contactless and a couple of apps) that they switched between – each making up less than a quarter of their usage, with a long tail of occasional (less than once per month) options, likely for unusual situations.

Our research asked how people actually pay (not how they want to). Many surveys have shown that people want fewer and simpler ways to pay. For example, the RAC Report on Motoring 2023 found 82% of EV drivers think there are too many different apps and websites used to administer public charging points. Our research shows the reality is not meeting this need.

It's reasonable that people may want two different ways to pay for their personal and professional charges. But the level of variation suggests that the majority of users are being forced to use multiple payment options to navigate an overly complex charging system.

Estimate how much of your total monthly payments on public EV charging (excluding home charging) go on the following.	Never	< once/ month	0-24%	25-49%	50-74%	75-99%	100%
Contactless card payment	11%	33%	25%	7%	9%	8%	6%
EV charging network apps (e.g., PodPoint, InstaVolt)	12%	40%	27%	7%	6%	2%	2%
Multi-network apps (e.g., Zapmap, Octopus Electroverse)	23%	31%	26%	6%	4%	2%	1%
Car company apps (e.g., those from Tesla, Audi or Kia)	53%	14%	13%	3%	1%	1%	1%
Non-EV apps (e.g., Parking apps)	46%	27%	10%	2%	1%	0%	1%
Personal RFID card/fob	40%	23%	14%	4%	1%	1%	0%
Company RFID card/fob	71%	5%	2%	2%	1%	0%	1%
A link/QR code at the charger to an online payment site	59%	16%	8%	2%	2%	1%	1%
Text to pay	79%	6%	2%	0%	0%	1%	0%
Pre-booked online	79%	7%	1%	0%	0%	0%	0%

* Tables exclude non-responses so do not add up to 100%

"For drivers with accessibility issues, the priority is usually spending as little time outside their vehicle as possible, and usually that means contactless is the best option. Yet plenty of chargers don't offer it yet."

Kate Tyrrell ChargeSafe

Potential solutions

Guarantee contactless: Whilst there was huge variation in our data, contactless just about came out top, and clearly offers many advantages for those who want to turn up and charge without hassle. Kate Tyrrell of ChargeSafe, which advocates for safe, accessible charging, notes that, "for drivers with accessibility issues, the priority is usually spending as little time outside their vehicle as possible, and usually that means contactless is the best option. Yet plenty of chargers don't offer it yet."

The new Public Charge Point Regulations mandate that all public charge points above 8 kW must allow users to pay by contactless. The challenge here is that many older charge points do not have contactless. A solution that avoids fiddly electronic installations on every charger is to install payment kiosks – much like parking payment terminals – near to chargers. The chargers can then be connected up to these kiosks where the user interface, card reader, and payment processing is handled. Users park their car, walk to the kiosk, select their charger, and start the charge. Paythru recently launched such a solution in collaboration with Bright.Green, which can be deployed on any site with multiple chargers.

For the nearly 40,000 chargers under 8kW, CPOs can make their own choice and need to decide where to tread. There are cases where the investment may not be justified. But lack of contactless will undermine the user experience and that will likely mean missed customers. Kiosks could provide a nice solution for slow chargers on the street side or in private car parks, for example, like a modern version of parking meters. Operators need to balance cost of installation with potential revenue benefits, and make a call.

Ensure users can pay with any app they want:

"It seems pretty clear that a few big apps that work everywhere will eventually dominate – perhaps Zapmap or Electroverse" says Phil Shadbolt. "Customers want one app wherever they are. That will be tough for CPOs, who want customers' data and direct communication channels, but it's inevitable"

For fleet drivers, "what they want is a single card that handles everything in the background – ideally allowing them to track both home and public charging, and bill that back to employers" says Paul Kirby. "Schemes like those from Paua and Allstar are likely to win out, though it's an emerging market with all to play for. Those designing the schemes need to make it all work seamlessly – reputation is everything, and that is built on a great user experience." The multiple app situation will be addressed to some extent by the implementation of the roaming mandate in the Public Charge Point Regulations – however it only mandates at least one roaming partner, so it won't completely resolve the issue. "The ultimate solution is that all apps work with all chargers" says Gary Comerford.

"Ultimately what matters is interoperability and standardisation" adds Kirby. "CPOs need to get on board with that, and open up their charge point data to other apps that people want to use, and which will bring them business, rather than trying to keep their customers locked in."

Apps could become more like loyalty schemes:

Whilst CPO-specific charging apps are likely to wane in popularity, CPOs can reinvent them to attract users through rewards and loyalty schemes. Customers don't want to be forced to use an app for every charger, but many will voluntarily do so if they get points they can spend.

We can learn a lot from retail. "Fleet drivers long filled up with petrol at Tesco" says Paul Kirby, "because they could grab the Clubcard points for themselves". Charge points might want to consider competing on incentives rather than trying to lock people into apps. That draws people to your charger and allows you to capture data without annoying customers."

"We already see Sainsbury's offering Nectar points for using their chargers" he adds. "And the Be.EV app has an interesting model – it has really built its app around the user with lots of incentives to use it".

When people say too many apps, it's not that there are too many in existence; it's that each individual is forced to have too many on their phone. "There's no problem with people having several apps in order to take advantage of lots of incentive schemes, but it should be because they want that, not because they are forced to have them all to get around", says Gary Comerford.

Provide clearer information: A lot of this problem comes down to understanding. "Contactless is often an option but drivers, especially new ones, just don't know that" says Gary Comerford. "So they arrive at a new charger, see the instruction to download the app and do that. Then they repeat at the next charger until they have too many apps."

"CPOs should be more transparent about the availability of contactless and provide clear instructions on how to use it. They obviously have an interest in people downloading their app, but they risk undermining EV uptake if EV drivers are always complaining to their friends about all the apps they have to download. Better to make it clear and easy and play the long game of making EV ownership popular." Again, digital displays, whether on the charger or via a linked kiosk, make it easier to provide information and update it as user needs change or feedback is received.

"Customers want one app wherever they are. That will be tough for CPOs, who want customers' data and direct communication channels, but it's inevitable"

Phil Shadbolt
Founder and CEO of EZ-Charge

CHALLENGE

Three

Will my payment go through?

Directly related to the previous challenge is whether the system will actually work. Our research shows a surprising frequency of problems at the charge point. 87% of drivers have had to download a new app at the charge point at least once, and 19% say they have had to do it frequently. Similar numbers were found for people who had to update existing apps they had already downloaded.

Having a card rejected was also surprisingly common. A massive 40% say this happens occasionally or frequently. That is a worryingly high number. In an age where people often carry a single card, often virtually in their phone wallet, being told it doesn't work or that they need to insert it and enter the PIN can be a huge hassle, and often the end of the transaction. Getting this right will also be vital to hitting the target of 99% network reliability in the new Public Charge Point Regulations.

Customer mobile connectivity is also an issue. Not all mobile phone networks have good coverage everywhere, so apps that rely on internet connections don't always work, causing 62% of drivers occasional or frequent payment problems.

Whilst less common, things have got so bad that 45% of drivers have had to phone up to make a payment at least once, and 61% have actually left the charge point because of unacceptable payment options.

All of this is frustrating to drivers whose time is precious. "Fleet drivers will get particularly frustrated if a charger won't process a payment, as it can waste a precious ten minutes or more of their working day" says Paul Kirby. "And they will likely not return to that charger."

Have you ever had to do the following at a charge point?

	Never	Once	Occasionally	Frequently
Had to download an app in order to pay	13%	20%	48%	19%
Had to update an app in order to pay	32%	16%	40%	12%
Faced app payment problems due to poor mobile connectivity	20%	18%	41%	21%
Called a helpline to make a payment over the phone	55%	16%	24%	5%
Left because the charge point didn't have the payment method you needed (e.g. cashless)	38%	20%	35%	6%
Had a payment card rejected	43%	16%	32%	8%

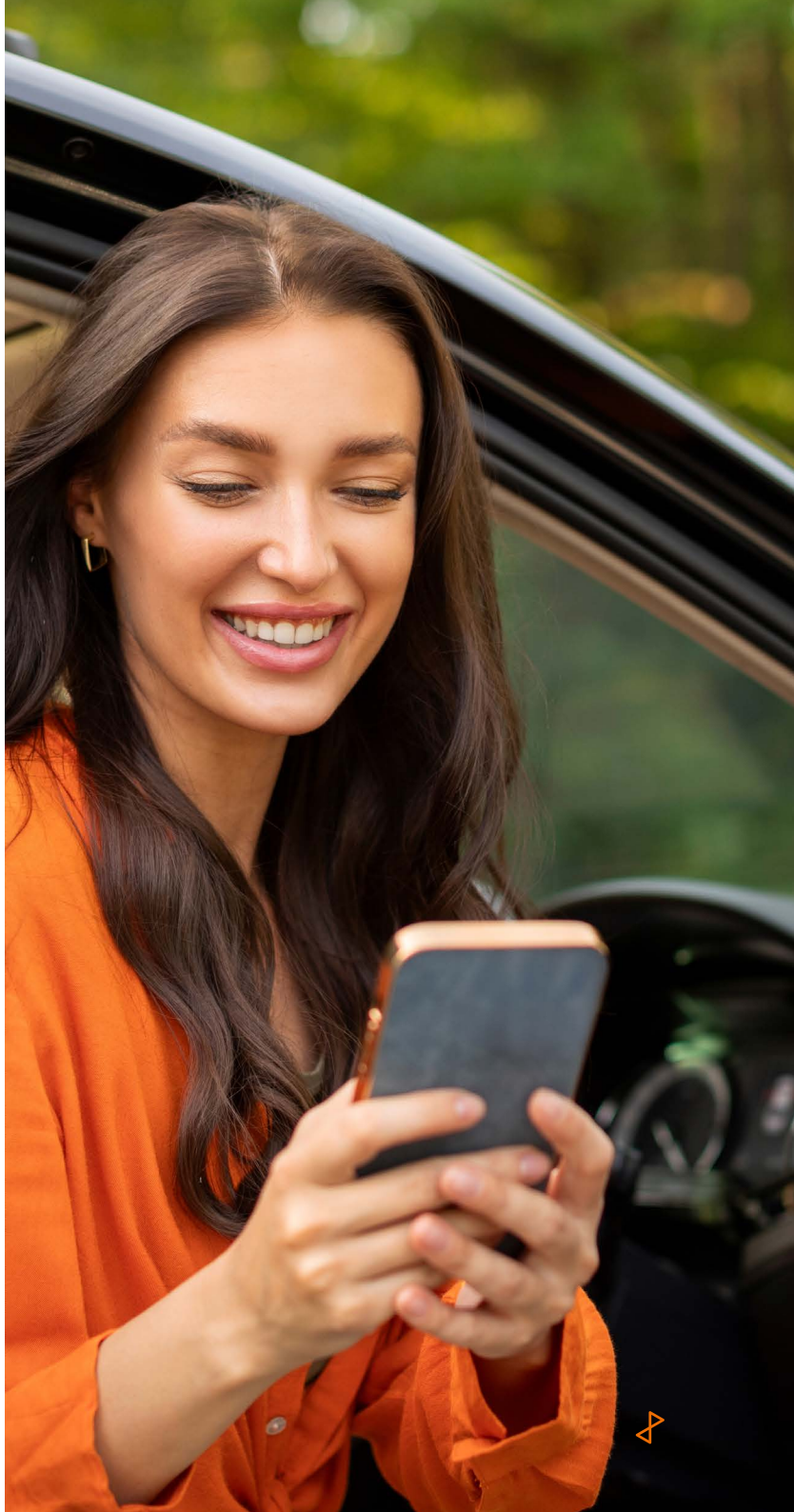
Potential solutions

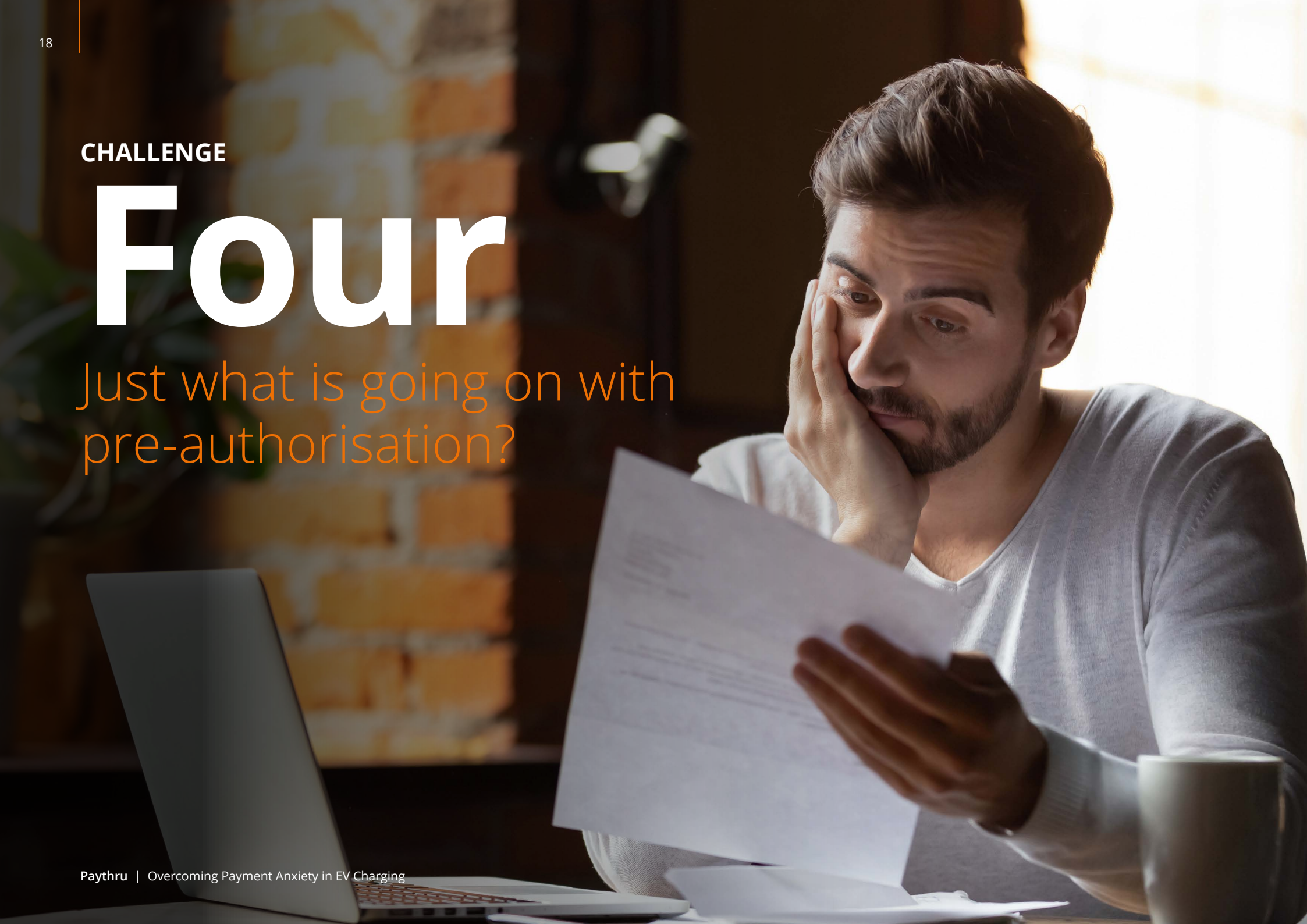
Mitigate situations that prevent users from paying: Consider the potential payment problems and design software solutions that minimise the risk of a valid card being rejected or requiring a PIN. CPOs must use the right hardware and software (and integration of both) to ensure their devices can handle PIN challenges, and implement offline processing for contactless devices should signal fail, as is done in planes and underground mass transit. Apps should also avoid mandatory updates that lock the app unless absolutely necessary.

Offer backups: Offer easy-to-use options in situations where a card may be rejected, such as pay by text, or some other means of validating the card. For those who want to use their app (e.g., to get rewards) but have no signal, there are creative solutions available. Retailers allow users to add unclaimed reward points with a receipt code. Charge points could do something similar, but automate the whole process, so that disconnected users can scan a QR code when they pay at the machine, which automatically links the payment to the app and processes it as if it were made in the app.

Have humans available as a last resort: If all else fails, make sure drivers can connect to a person that can process the payment quickly and efficiently. Design that around a range of user needs. No one wants to be in this situation, but it's made all the worse if the system won't work for you.

Whilst the new regulations require a 24/7 toll-free helpline, customer-focused CPOs can go even further, embracing technology to make the customer experience more inclusive and to reduce the cost burden of call centres. "Often the only solution is a call to a help centre, which is a problem for people who are hard of hearing, or even in noisy environments" says Kate Tyrrell. "Having options such as a chat feature on the payment terminal display or in the app could resolve this." This is no one's first choice but it can prevent a frustrating experience turn into the loss of a customer, or a social media disaster.





CHALLENGE

Four

Just what is going on with pre-authorisation?

Finally, we tackle the issue of pre-authorisation – where money is reserved against your payment card, prior to the charge, with the charge then deducted. This makes sense as it allows payment in advance, ensuring the user isn't stuck with a bill they can't pay (e.g., for any of the reasons above), and the CPO does not have to chase people down who forgot to pay.

The amount held is at the merchant's discretion and can be as little as £1 per charge or as much as £60. The issue is that EV drivers are unlikely to know which value an operator will hold until it shows up on their bank statement as a "pending transaction" or as a payment alert. The worst stories tell of drivers trying to unsuccessfully start a charge three times, and getting three pre-authorisation fees of £45, which were not refunded because the charge didn't complete (because it didn't start), and which took a month and a long phone call to get back.

People are not against pre-authorisation. But they are confused by it. 90% of respondents had been asked for pre-authorisation when charging, and 80% had experienced at least one issue, including: being unclear what they were committing to (49%); waiting more than a day for a pre-authorisation fee to be refunded (49%); and multiple pre-authorisation fees on their card for a single charge (36%).

"Pre-authorisation can be a real issue" says Kate Tyrrell. "Some chargers have been known to not refund it and have cumbersome processes for claiming it back, like having to call up after 30 days. If the EV industry wants to shed its elitist image, then it needs to be accessible to all, including those who may not be able to wait a month for £45 to be refunded".

Much of this is confusing, and can create anxiety when strange payments appear on bank statements, even if nothing is actually wrong. But delayed refunds can be a real problem, and will become more so if we are to extend EV ownership beyond today's most affluent drivers. A much reported delay in mischarged parking refunds in 2022 caused people to go into overdrafts and left some unable to make bill payments.

"Pre-authorisation is a big area of dissatisfaction" says Phil Shadbolt. "It's very complicated and hard for people to understand, and causes a lot of confusion. We need to do it to protect ourselves, but we can't wait for better alternatives".

Have you experienced any of the following (tick all that apply):

ISSUE	PERCENTAGE
Being presented with a pre-authorisation fee and being unclear what you were committing to	49%
Waiting more than a day for a pre-authorisation fee to be refunded	49%
Different pre-authorisation fee amounts when using different chargers	43%
Multiple pre-authorisation fees on your card for a single charge	36%
None of the above	20%
I have never knowingly been asked for pre-authorisation	10%

Potential solutions

Make pre-authorisation transparent: The most obvious solution is to clearly communicate pre-authorisation fees and expected refund timelines in the app and on the charge point.

Make fees fairer and offer incremental pre-authorisation: "If we have to have pre-authorisation, there's lots that could be done to make it fairer" says Kate Tyrell. "I'd like to see the cap lowered at least down to £30, which is the maximum you'd pay for a full charge. But it should also be possible for charge points to allow drivers to set their own pre-authorisation level via the charge point interface or the app, so someone topping up £5 doesn't need to pre-authorise £45".

"Incremental pre-authorisation is the solution and will be a massive boost for the industry," says Phil Shadbolt. Incremental authorisation dynamically secures funds throughout a charging session, beginning with a low initial pre-authorisation amount which progressively increases in line with power consumption to prevent large reservations being held against a driver's account once the session has ended. That avoids large fees on the bank statement for small charges or charges that didn't start.

Make charging critical infrastructure: "Ideally, CPOs should work with banks and legislators to provide a system similar to petrol stations where pre-authorisation is refunded immediately" says Tyrrell.

Banks deal with petrol stations differently, explains Gary Comerford. "They can pre-authorise £99, take the payment, and instantly de-authorise. In EV charging the pre-authoristation charges the money and then refunds it, which takes time, and that is where the problems come from."

If we could lobby to get charging classed as 'critical infrastructure' like petrol stations, that would make it easier to set up simpler systems with banks" he adds.

Conclusion

As we move from early adopters to mainstream drivers, expectations will rise, and tolerance will fall for the type of problems discussed in this report.

That clock is ticking. People will have to change to EVs eventually. In just over a decade there will be no new ICEs. Fleet and company car schemes – including those like Motability which lease accessible cars - are gradually switching to electric, bringing a new generation of EV drivers, some of whom will have switched out of necessity rather than choice. They will increasingly demand a good user experience.

The EV industry has understandably focussed on hardware. But the problems causing driver frustrations now are mostly linked to software and the experience that comes with it. Software can cause the problems, but well-designed software is the solution to the issues raised in this report. Fortunately, most of the hard work solving these has already been done in adjacent industries - they just need to be adapted to EV charging.

Kate Tyrrell concludes on a hopeful note. "EV charging is becoming more accessible every day. As more diverse drivers switch to EVs – including those with accessibility needs and on Universal Credit – we increasingly find that the full breadth of user issues are publicly discussed, and charge point operators are pushed to improve. And to be fair to CPOs, most are listening and want to act in their users interests. Fortunately the days are gone when chargers were in dark corners of a car park where many felt unsafe using them. They listened and changed. But there is lots still to do. CPOs need to keep listening to what drivers of all backgrounds are finding difficult, so they can adapt to offer the right solutions."

Survey methodology

The survey was hosted on the Paythru website and open to all EV drivers. Respondents were gathered through promotion via social media channels, including those of Paythru and The EV Café, who were kind enough to support this report.

The respondents comprised:

- 179 private EV drivers (of which 73 used their car for work and personal use, 106 for just personal use)
- 21 professional drivers (3 owned their EV, 18 drove a company EV)

To discuss the challenges in this report and how we can help solve them, contact

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