Novuna®
Vehicle Solutions

The road to net zero

Where are we now and what's next?

Tomorrow. Together

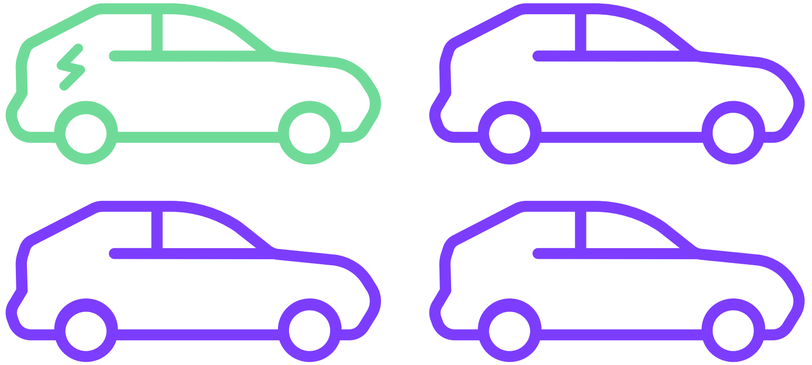
To assess where we currently sit on the road to net zero, we've delved into the facts and figures that will shape the next stage of our journey together. The findings provide good reasons to be optimistic; however, it is clear there are some key challenges we still need to overcome.

In September 2023, Rishi Sunak pushed the official deadline for banning the sale of petrol and diesel-only cars and vans back to 2035. The argument was that the automotive industry needed more time to adapt, and the public needed to have greater confidence in the scale and dependability of the public charging infrastructure.

There is no doubt that the change in deadline has caused a slowdown in individual drivers making the switch to electric vehicles (EVs). On the other hand, buoyed by the continuation of highly preferential Benefit in Kind rates, along with other tax breaks and incentives, business fleet operators and drivers able to take advantage of Salary Sacrifice schemes, continue to switch at ever-increasing rates.

Overall, the Society of Motor Manufacturers and Traders (SMMT) is predicting that battery electric vehicle registrations will rise 31.6% this year and a further 28% in 2025, taking their overall market share to 26%.

This sounds very positive — and it is — but some significant challenges remain. So where exactly are we on the road to net zero and what does it mean for drivers and fleet managers? Let's take a look at the key issues.

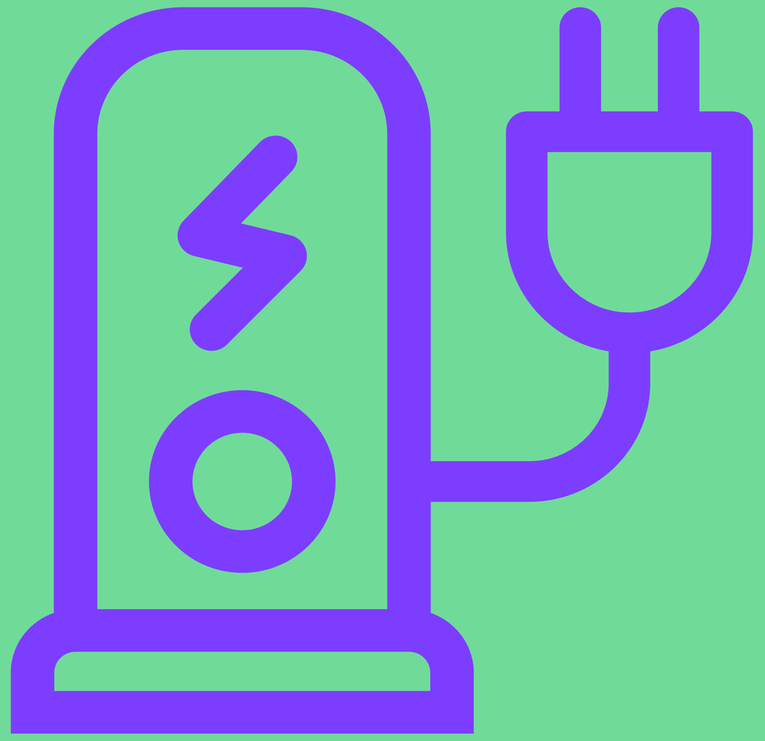


1 in 4

new vehicles delivered in 2025 will be an EV

Public charging infrastructure

Despite the fact that the average car journey is just 8.1 miles per trip — a figure that has barely changed in the last 20 years — and 99% of car journeys in England are under 100 miles, drivers have long-cited range anxiety and access to public chargers as one of the biggest barriers to making the switch.



The current situation

The government's electric vehicle infrastructure strategy indicates that the UK will need at least 300,000 public chargers by 2030, but this is very much a bottom-end estimate.

There are currently just over 8,000 fuel stations in the UK and an estimated 66,000 pumps. That's roughly 1 pump for every 530 cars.

Assuming we hit the predicted 10 million EVs by 2030, 300,000 charge points (likely 450,000 connectors) would equate to one connector for every 22 electric cars.

This might sound ok, but filling up with petrol or diesel typically takes between 3 and 5 minutes before you are on your way with enough fuel for at least 3-400 miles of range (often much more).

On the other hand, even using a 50kW rapid charger, a 60kWh battery EV takes around an hour to charge to 80%. And, of the nearly 60,000 public charge points currently available, only c.20% are rapid/ultra-rapid chargers.

Another issue is geography and the current disparity between the charging 'haves' and 'have nots'.

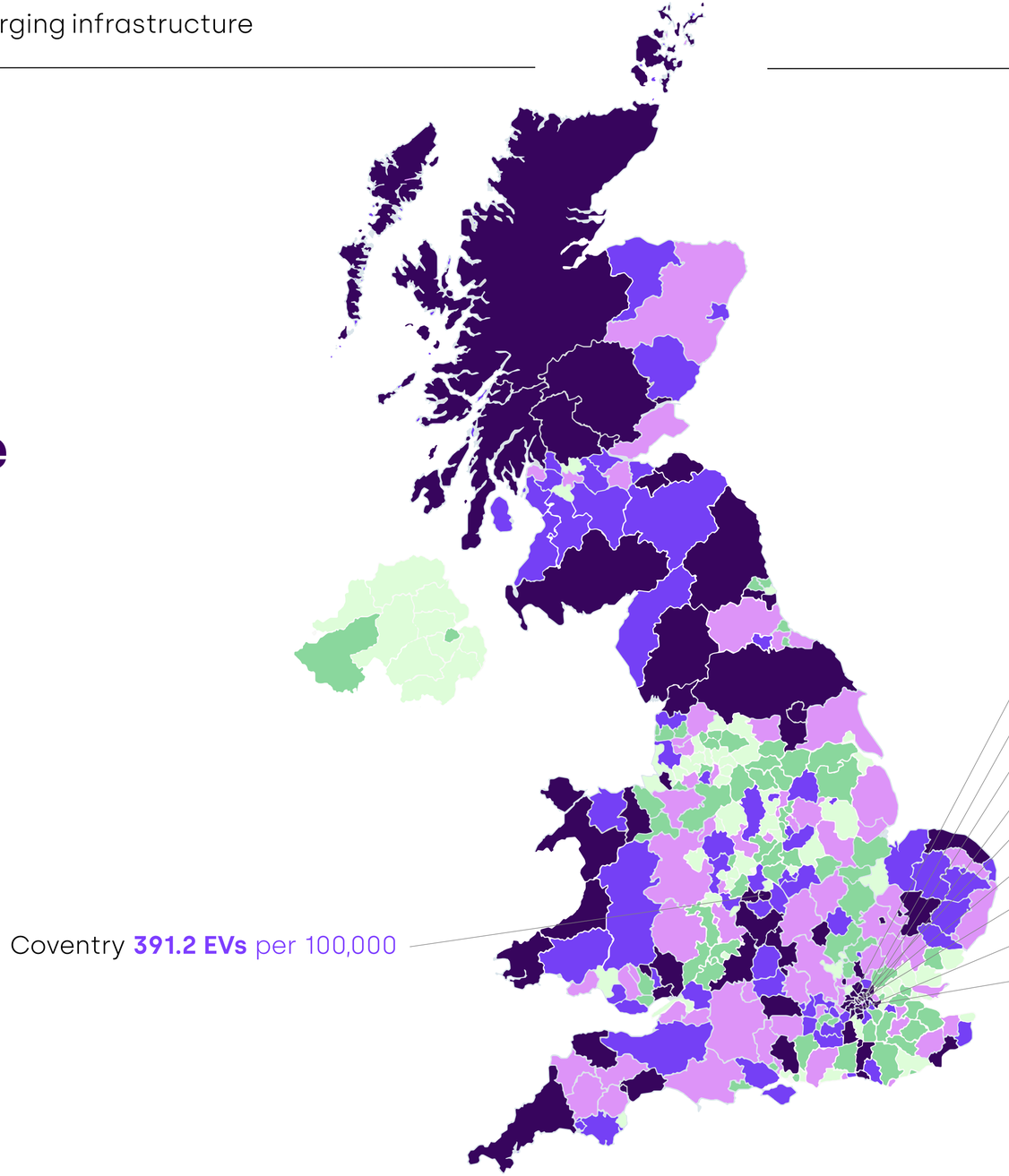
2024 | **one fuel pump for every 530 cars**

2030 | **one connector for every 22 EVs**

Local Authority	Total public charging devices	Total public 50kW and above	Charging devices per 100,000 population
Westminster	2,724	68	1,328.2
Hammersmith and Fulham	2,424	53	1,322.5
City of London	87	7	1,009.5
Kensington and Chelsea	875	4	607.9
Southwark	1,774	24	579
Coventry	1,343	72	391.2
Richmond upon Thames	755	19	386.7
Merton	791	17	367.4
Wandsworth	1,129	36	343.8
Brent	1,048	17	309.2

Charge point **density per 100,000 people**

- bottom 20%
- 20% to 40%
- 40% to 60%
- 60% to 80%
- top 20%



Coventry **391.2 EVs** per 100,000

9 of the top 10 local authorities for public charging availability are within London

Brent **309.2 EVs** per 100,000

Westminster **1,328.2 EVs** per 100,000

City of London **1,009.5 EVs** per 100,000

Southwark **579 EVs** per 100,000

Kensington and Chelsea **607.9 EVs** per 100,000

Hammersmith and Fulham **1,322.5 EVs** per 100,000

Wandsworth **343.8 EVs** per 100,000

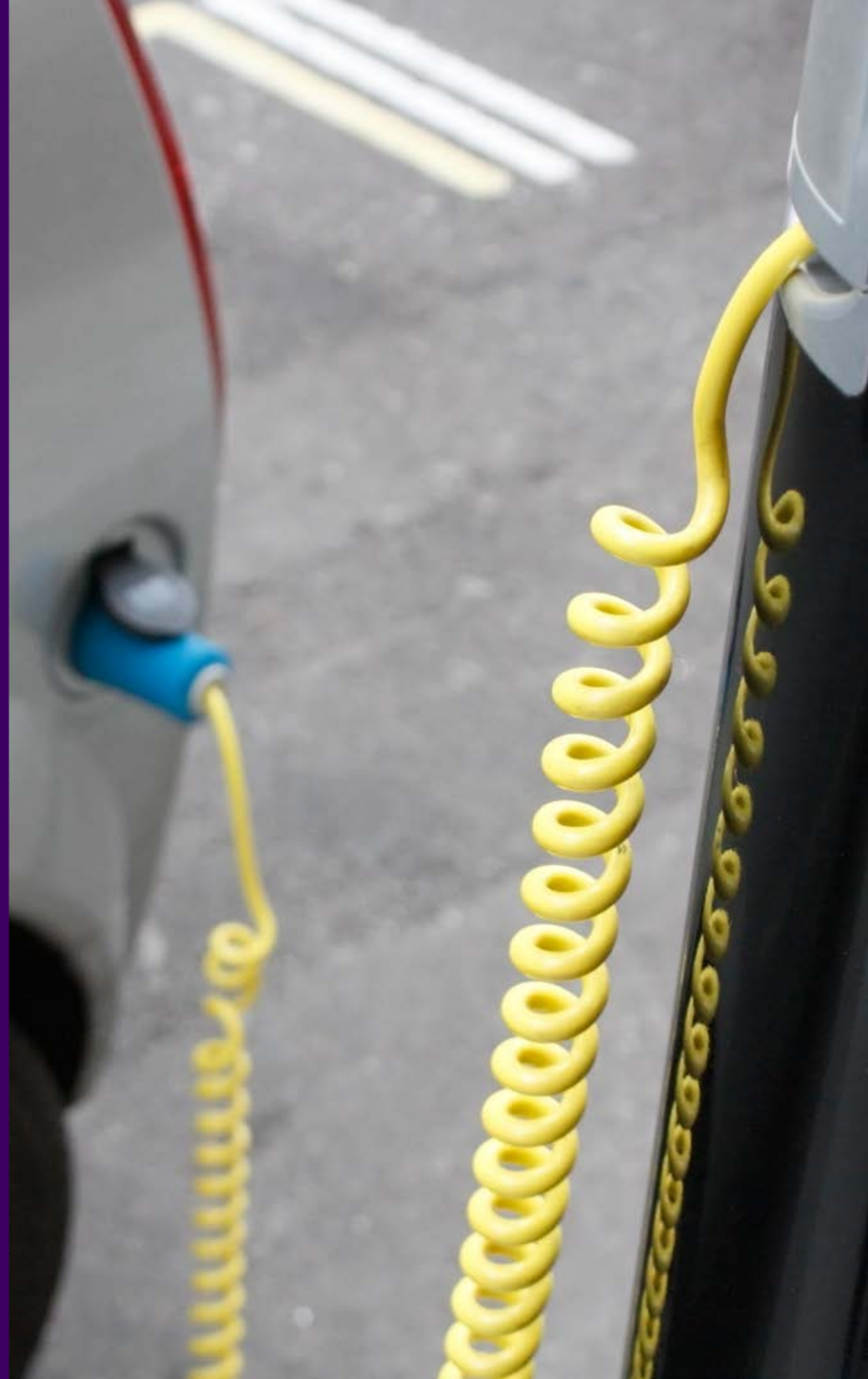
Merton **367.4 EVs** per 100,000

Richmond upon Thames **386.7 EVs** per 100,000

We should remember that in heavily populated areas, where many homes are without the private, off-street, parking needed for a home charge point, there needs to be a strong public charging infrastructure in place before people will start switching.

Some of the areas could be considered relatively well served in this respect. However, the picture is far from consistent and there are other high-density areas which are a long way behind.

Local Authority	Total public charging devices	Total public 50kW and above	Charging devices per 100,000 population
Manchester	312	70	56.7
Birmingham	521	164	45.6
Newcastle upon Tyne	131	35	43.9
Barking and Dagenham	77	13	35.2
Bradford	180	68	32.9



“just **49% of local authorities** currently have a vehicle charging strategy in place”

It’s worth noting that just 49% of local authorities currently have a vehicle charging strategy in place. This is up from 37% last year, but still a long way from where we should be at this point. That said, the situation should improve as the second tranche of Local Electric Vehicle Infrastructure (LEVI) funding comes through. However, there needs to be more consultation with fleet operators to ensure that the strategies developed are designed to meet the current and future needs of businesses in the area.

If we look at the total number of chargers per electric vehicle, things look a little rosier. With around 1 million fully electric cars on the road and 57,290 charge points (as of February 2024), that’s just over 17 cars for every charger. On the face of it this sounds pretty good, but unfortunately, not only are the cars and chargers not necessarily in the same place but the charge point infrastructure needs to precede adoption of EVs, especially in high-density areas where installing a home charge point isn’t possible.

What's next?

2023 saw a 36% growth in charge points and, if this trend continues, then the total public charging infrastructure will hit the 300,000 mark at some point in 2028 and exceed half a million by 2030.

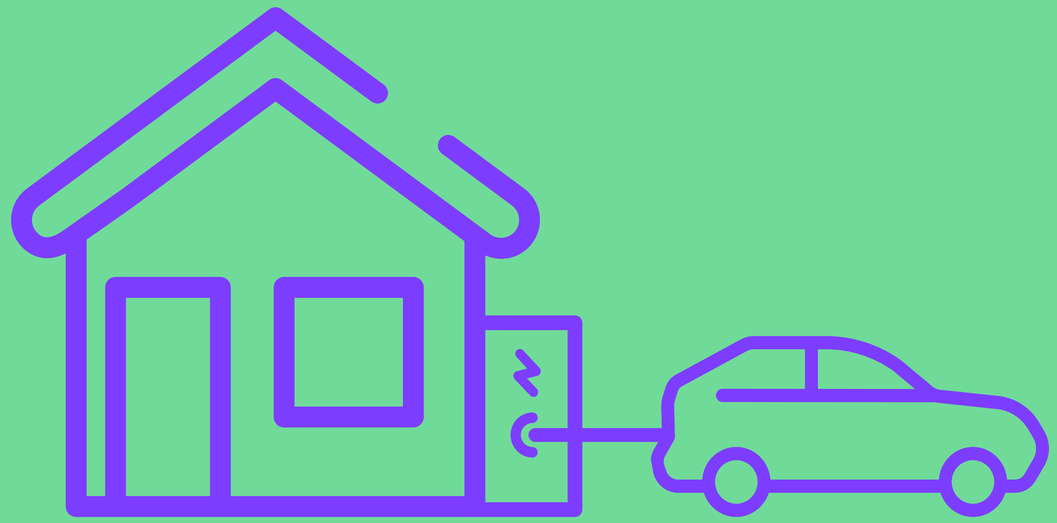
In reality, the rate of increase typically slows as the numbers get bigger, but it shows we are heading in the right direction. However, we must ensure that new chargers are predominantly rapid (50kW – 149kW) or ultra-rapid (150kW) and that the geographical disparity is addressed.

In December 2023, the government launched a £70 million rapid charging fund pilot to support the rollout of ultra-rapid charge points at motorway service stations, and last year's Autumn Statement included a commitment to give priority planning to EV charging hubs to keep up the pace.

This all helps, but charge point operators need to play their part and focus on areas with low charger per capita ratios rather than simply focusing on current EV density.

Home charging

The lack of confidence in the public charging infrastructure is highlighted by the fact that 93% of EV drivers have access to a home charger. It's no surprise really, as charging at home is by far the cheapest way to replenish your EV battery. Shop around and you can get rates of c.7p per kWh compared to average public charging costs of 50p to 85p per kWh (depending on speed). In fairness, home charge points are generally no more than 7.4kW, but then again, speed is much less important when charging overnight.



The current situation

Research shows that only 56% of homes are capable of having a charge point installed and the bulk of those already having made the switch to an EV primarily rely on home or workplace charging. That still leaves just under 12 million homes in the UK with no viable home charging option.

The government has responded by updating building regulations so that all new builds with an associated parking space must have a charge point installed on the property. It's a logical move, but it doesn't address the needs of EV drivers without private parking.

However, as of 18 March 2024, the EV Charge Point Grant, which provides funding for 75% of the cost of buying and installing a socket, up to a maximum of £350, has been extended to drivers with on-street parking. It is less straightforward than a charge point on your own property, as it requires permission from your local planning and highways authority, who will need to consider whether street parking is generally available outside the house and the road is sufficiently wide to allow easy passage of traffic.

Despite the grants for landlords, renters, flat owners, and certain on-street parking situations, the available support still fails to meet the needs of millions of potential EV drivers.

only

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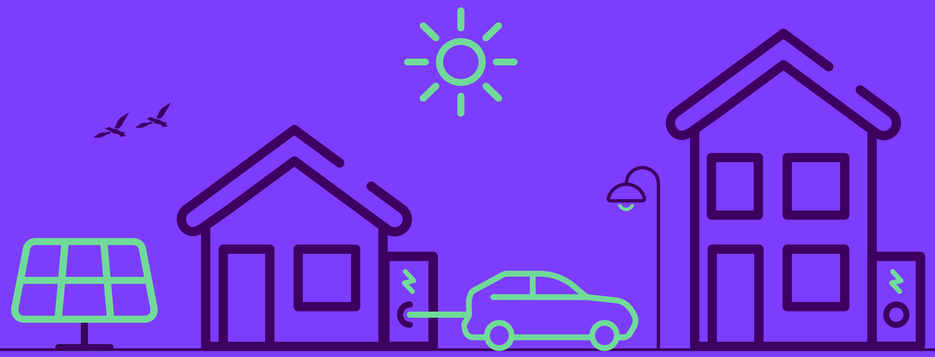
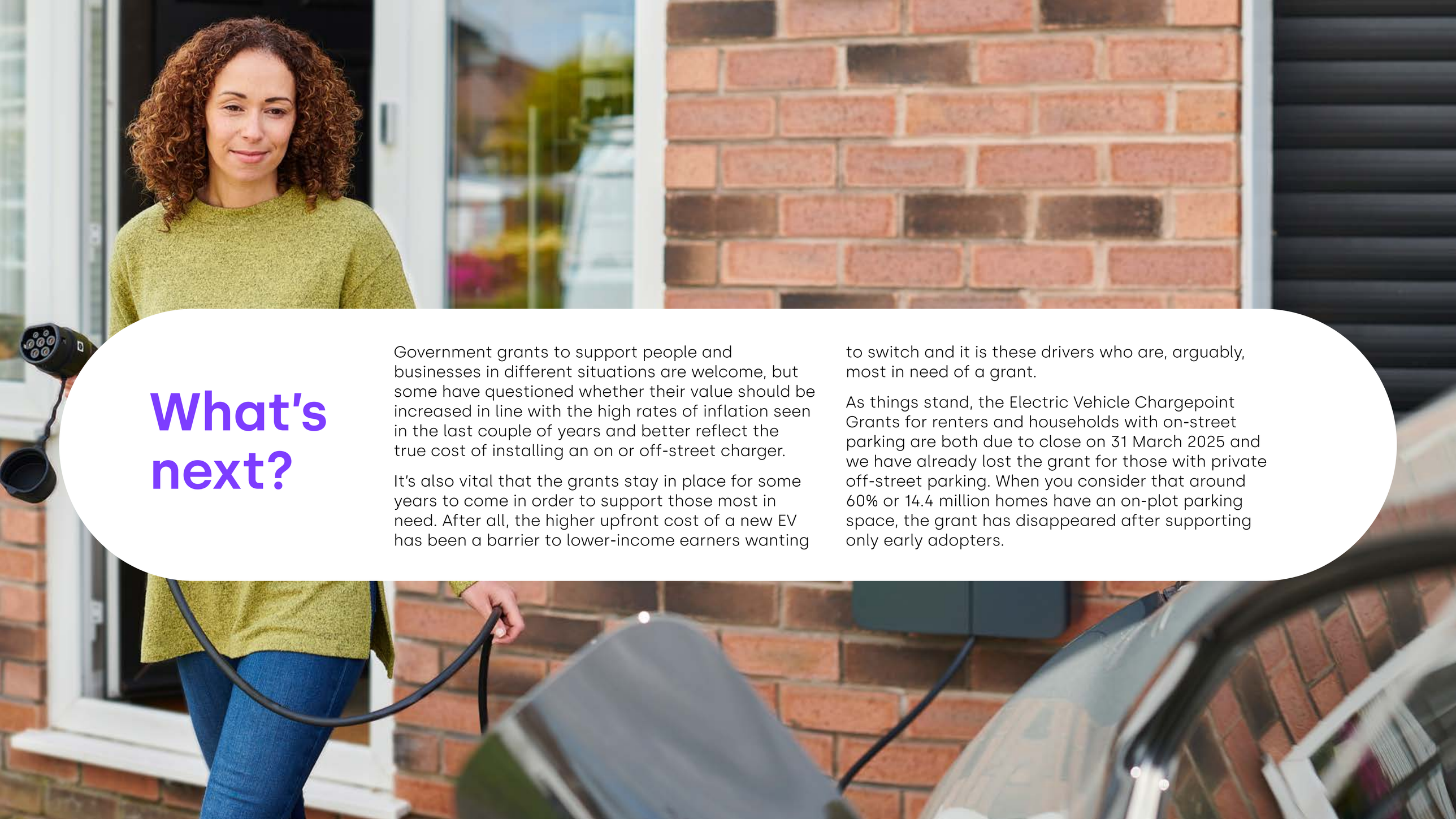




What's next?

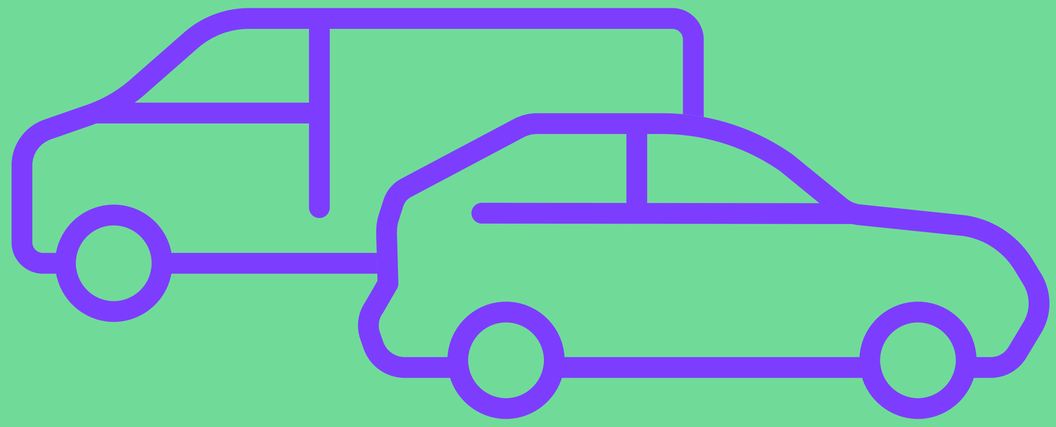
Government grants to support people and businesses in different situations are welcome, but some have questioned whether their value should be increased in line with the high rates of inflation seen in the last couple of years and better reflect the true cost of installing an on or off-street charger.

It's also vital that the grants stay in place for some years to come in order to support those most in need. After all, the higher upfront cost of a new EV has been a barrier to lower-income earners wanting to switch and it is these drivers who are, arguably, most in need of a grant.

As things stand, the Electric Vehicle Chargepoint Grants for renters and households with on-street parking are both due to close on 31 March 2025 and we have already lost the grant for those with private off-street parking. When you consider that around 60% or 14.4 million homes have an on-plot parking space, the grant has disappeared after supporting only early adopters.

Suitability and choice

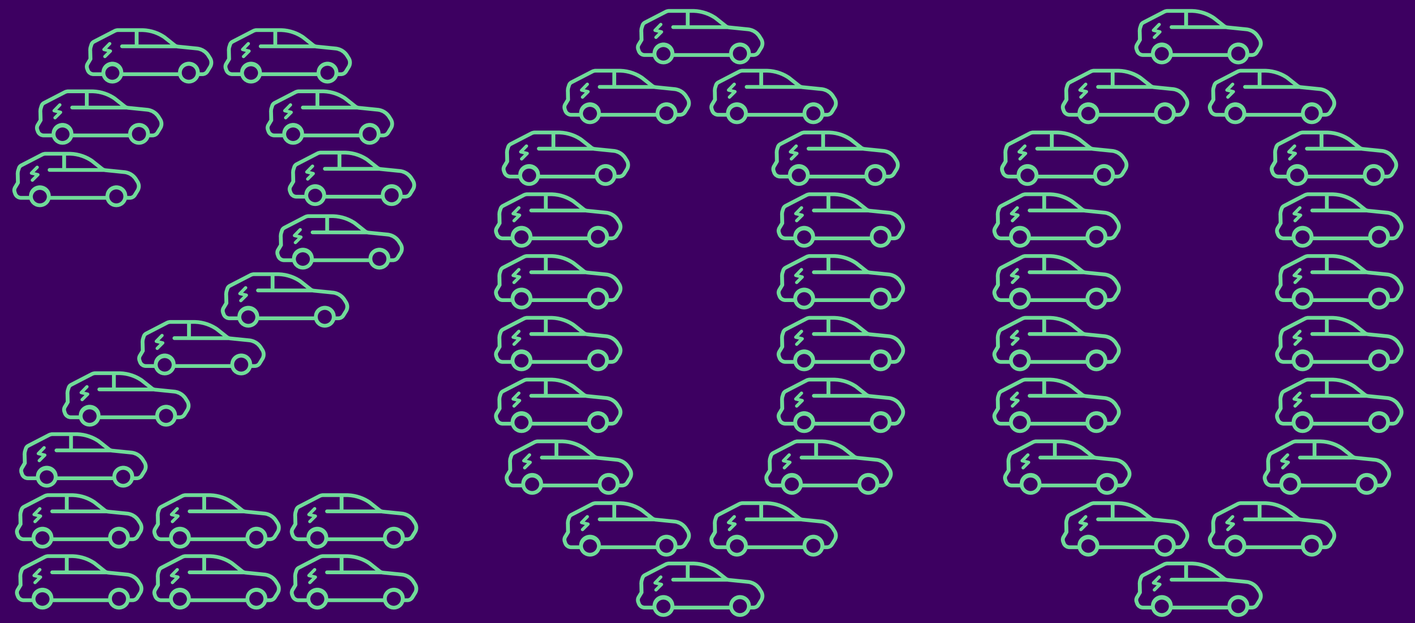
Electric cars may be better for the environment, but green credentials alone are not enough for the mass adoption of EVs. Cost, fuel efficiency, practicality, and overall driving experience are all key factors when choosing a new car.



The current situation

Back in 2014, anyone wanting to switch to an electric car would have to pick from just a handful of options. Fast forward to 2024 and there are over 200 models and variants to choose from. Yes, there are still some gaps, notably 4X4s, but the ever-increasing number of models means that, for the vast majority of drivers, there's no longer any need to compromise when switching to an EV.

there are currently over



EV models and variants to choose from

What's next?

Despite the change in the deadline for all new cars and vans to have zero tailpipe emissions by 2035, many manufacturers are sticking to their original plans. For example, Audi plans to offer 30 new models of EV by 2025, only launch full-electric models from 2026, and be all-electric by 2030. It's a similar story for Vauxhall and Nissan, but others, such as Ford, are taking advantage of the extra five years and plan to be all-electric and carbon neutral in Europe by 2035. In reality, while the exact dates are subject to change, the overriding theme is one of accelerating the switch to all-electric model lineups.

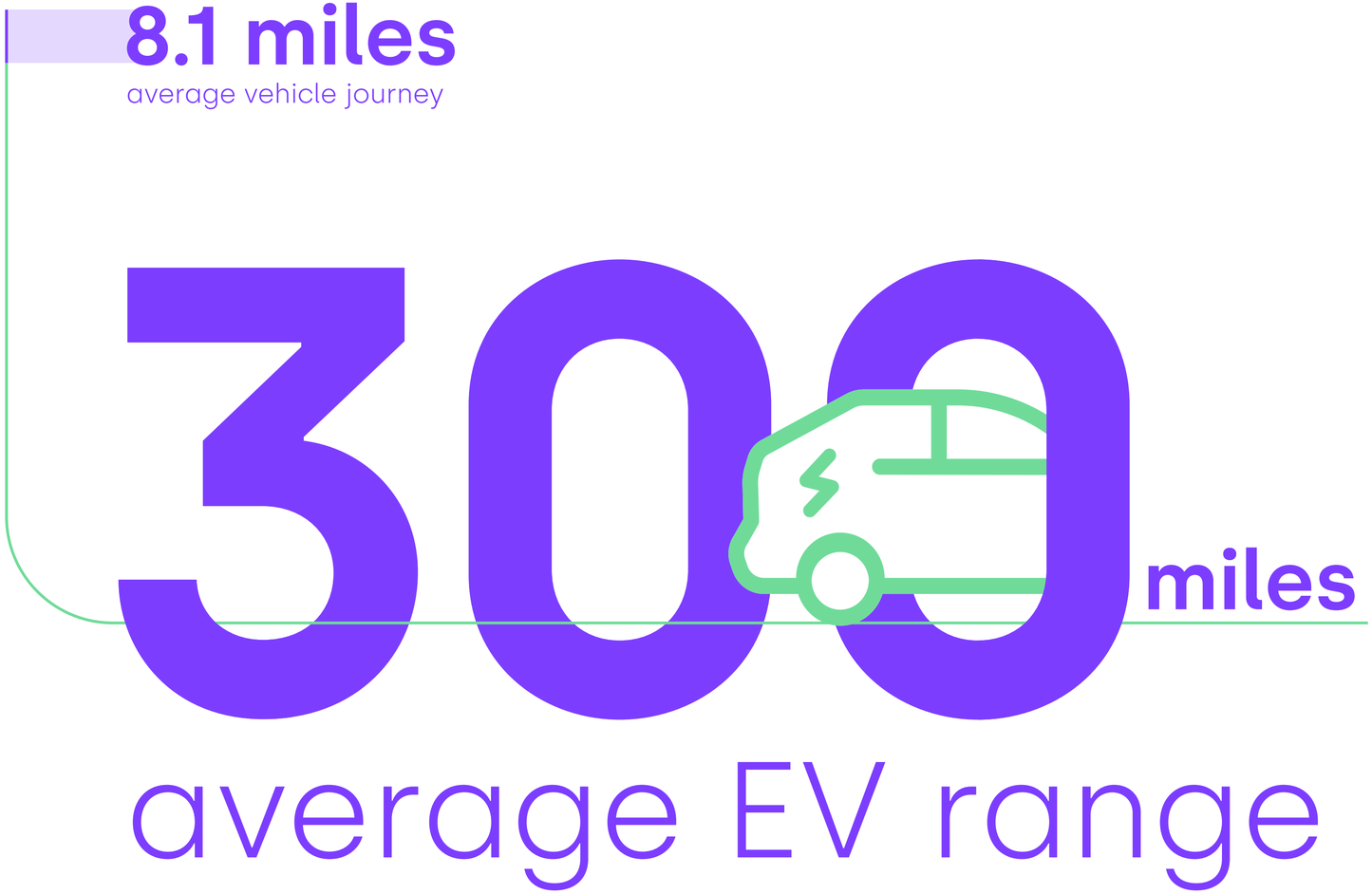
Then again, there is much more to the big switch than how long it takes well-established brands to release new models. As we have already started to see, there are plenty of new market entrants bringing greater competition and choice which, as a general rule, means lower prices and better specifications. EV-focused brands such as Polestar, CUPRA, Genesis, GWM, and BYD are already making waves and there are plenty more to come.

Range

Amongst drivers who are yet to seriously consider making the switch, insufficient range is often quoted as a major barrier. It's an issue that is inextricably linked to the size and shape of the UK's public charging infrastructure and concerns about committing to a vehicle that may only be suitable for 95% of their journeys each year.

The current situation

The average range of a new electric car coming onto the market is almost 300 miles, and there are premium models capable of 450 miles or more. Considering that Rule 91 of the Highway Code states that drivers should take a 15-minute break every two hours, this would seem to indicate that, even at current levels, drivers shouldn't be unduly concerned about running out of power — assuming of course they can find an appropriately powered charger to top up. Then again, not everyone sticks to the rules and some change drivers to speed up longer journeys.



What's next?

While more public charge points are being installed all the time, the picture changes between regions and, especially for those without the ability to charge up at home, there is still a need for longer-range vehicles at an affordable price. Increased competition and economies of scale will make a difference to the price, but the big leap will be in switching to solid-state batteries.

The key challenge to date has been that, while solid-state lithium-ion batteries offer better performance, they also suffer from a shorter effective life which, in turn, increases cost and reduces real-world viability.

It's a problem that Toyota believe they have solved with a first-generation solid-state battery that is capable of over 621 miles and a fast-charge time of 10 minutes for a 10-80% charge.

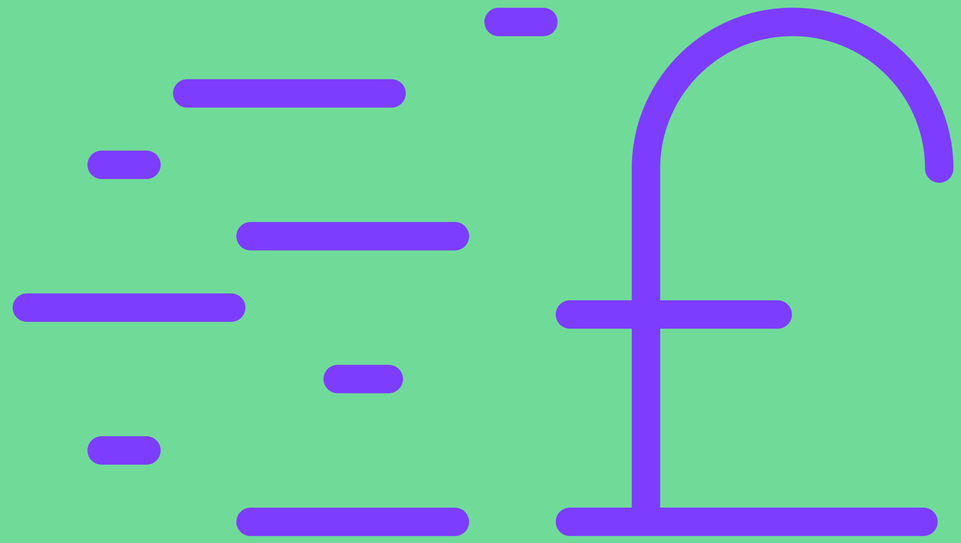
The aim is for these batteries to be ready for 2027/28 and the company is working on a next-generation solid-state battery that it claims could deliver a range of 1,000 miles from a single charge.

This is just an example of where we are heading, and it shows that range anxiety will be a thing of the past for even the most long-distance drivers. The question of when is a different matter.

> **621 miles** and a fast-charge time of 10 minutes for a 10-80% charge

Affordability

EVs have always been more expensive than their petrol or diesel counterparts and, while the gap is clearly narrowing, there is still some way to go before we achieve parity in terms of upfront costs. That said, it is important to remember that affordability goes far beyond the headline purchase or leasing costs.



The current situation

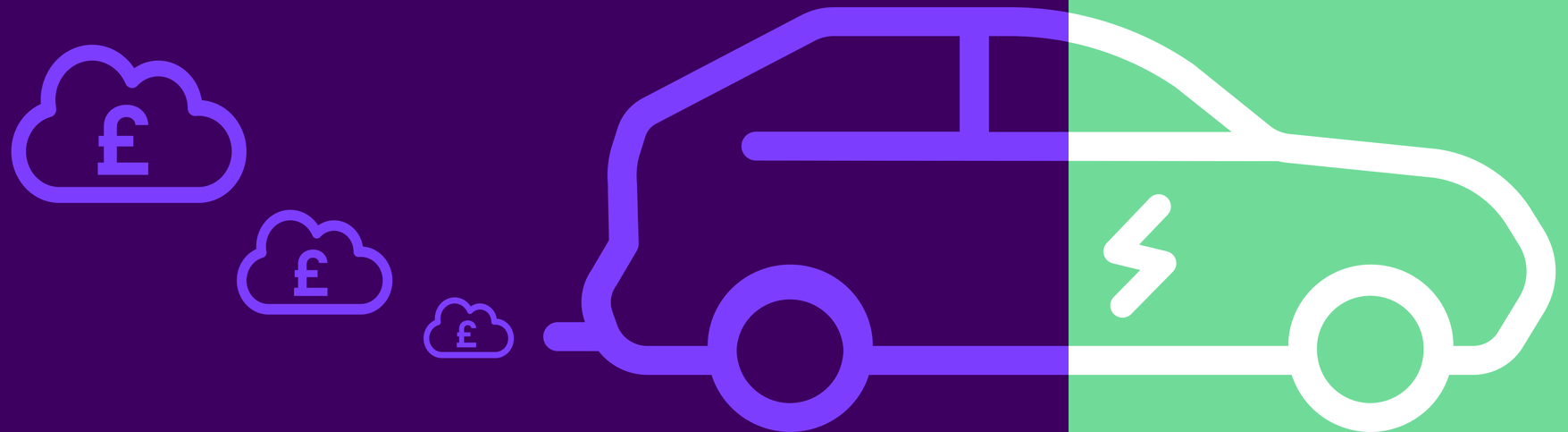
There's no denying that when it comes to headline costs, EVs appear to be more expensive to buy or lease. That said, government research indicates that the true cost of running an EV over 5 years is less than a comparable diesel model. In fairness, this does use several assumptions, including mileage, depreciation, and energy prices.

That said, recent research from the Energy and Climate Intelligence Unit (ECIU) also shows that the top 10 selling petrol cars of 2023 could cost around £700 a year more to run than their electric equivalents. This is positive news for those who look at the bigger picture but, in difficult economic times, the monthly budget often matters more than the long-term cost.

Whether buying or running an EV, a heavy reliance on public charging could wipe out a lot of the potential savings on offer.

We also need to bear in mind that c.80% of drivers buy their cars second-hand and, while some EV models are achieving parity with ICE equivalents, there is very little data to go on, with just 2.6% of used cars sold in 2023 having a plug. That's almost double the figure seen in 2021, but it is still a fraction of overall sales.

A healthy used car market isn't just crucial to achieving the UK's net-zero goals, it also plays a big part in protecting the cost of car finance models that are based on residual value — such as leasing and PCP.



Electric cars cost

£700

a year less to run

> Manufacturers need to certify that the batteries installed in their EVs will not lose more than 20% of their initial capacity over 5 years or 100,000km

What's next?

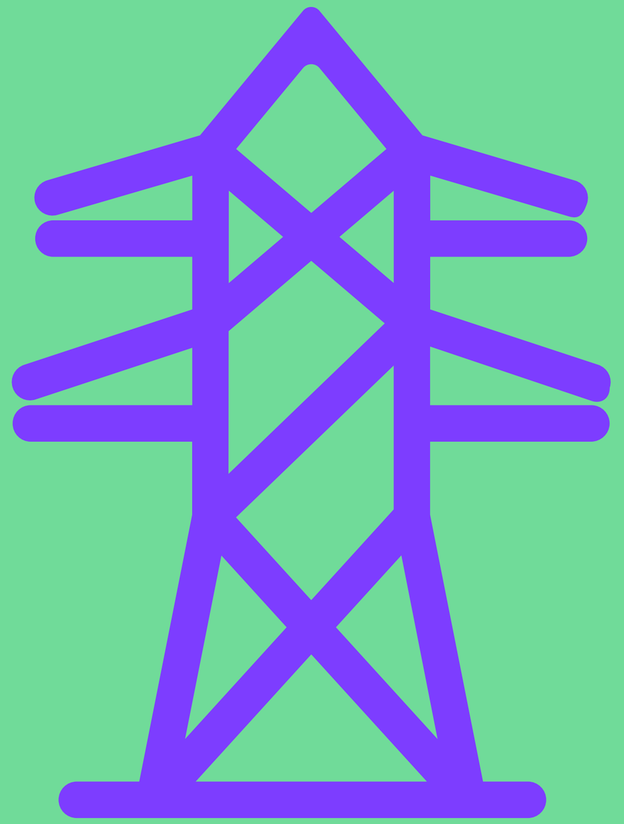
With such rapid improvements in battery technology, the used EV market suffers from the range anxiety facing EV drivers 3 or 4 years ago. This is something only time will cure, as newer longer-range mid-priced EVs start to flow into the used car market.

Concerns over battery health also need to be addressed. The average age of a car bought on finance is eight years, which is precisely the point at which EV battery warranties tend to run out. This is obviously much longer than the traditional three-year warranty offered on many ICE vehicles but, with average replacement battery costs of over £7,000 consumers need confidence in battery health and longevity.

The European Union's proposed Euro 7 standards are set to include the UN Global Technical Regulations on battery durability (UN GTR 22). This would mean that manufacturers need to certify that the batteries installed in their EVs will not lose more than 20% of their initial capacity over 5 years or 100,000km, and not more than 30% over 8 years or 160,000km. This will definitely help in the longer term, but more needs to be done to deal with current concerns, and the introduction of universally recognised battery health certificates/passports could go a long way to instilling confidence in second-hand EVs.

The National Grid

If everyone were to switch to electric vehicles tomorrow, there wouldn't be enough power available for everyone to charge up and the country would be plunged into darkness. Or so the sceptics say. Whilst this might sound worrying, it's not actually the reality we are facing.

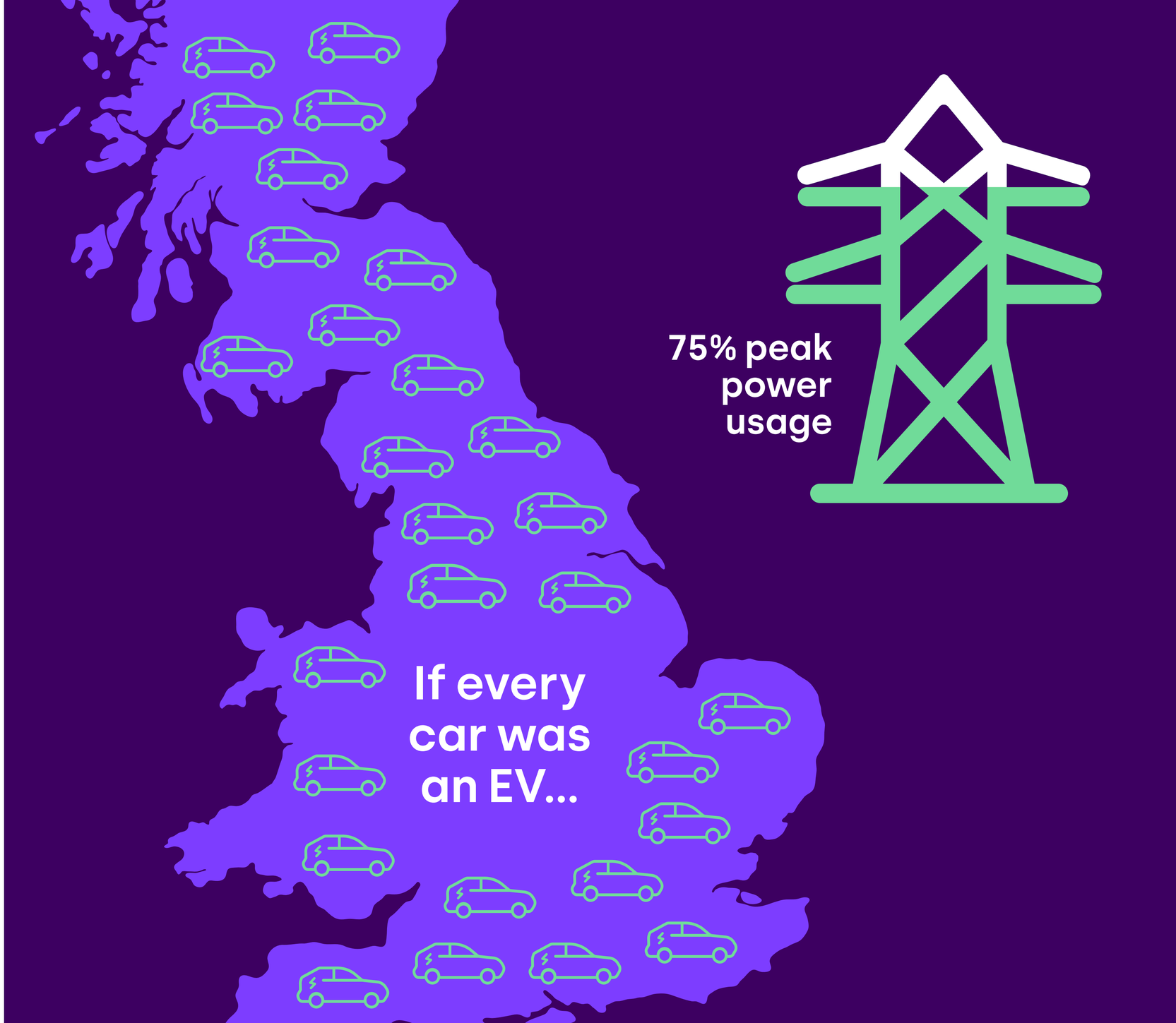


The current situation

It's important to remember that the switch to electric vehicles is a gradual one and therefore power generation capabilities only need to keep pace with adoption and, while there is no doubt that some fleet operators are currently affected by insufficient power to support a particular location's needs, there are no real concerns about the overall picture.

Since the turn of the century, the largest peak in demand for electricity was 62GW and that was back in 2002. Since then, energy-saving measures have reduced demand by approximately 16%. Even if we all switched to EVs overnight, the expected jump in demand would only be around 10%. In other words, in terms of sheer capacity of the national grid's wires, there really isn't anything to worry about.

It's also worth pointing out that EVs are not just an add-on to the power requirements of the UK. In fact, it has been estimated that refining 1 gallon of petrol uses c.4.5kWh of electricity, so reducing the number of petrol and diesel cars on the road makes more electricity available to charge up EVs.



Refining petrol for one tank uses the same electricity as:

Watching TV for **495** hours

Using a laptop for **990** hours

Charging over **4,000** mobile phones

The road to net zero - the national grid

Overall capacity is obviously important, but millions of EVs all plugging in at the same time could still be an issue and it's here that load balancing comes into play.

Keeping the grid balanced ensures that the electricity supply always meets the demand, and it involves second-by-second monitoring and adjustment by the electricity system operator (ESO). It's no easy task and to try and explain what they do there is a great interactive game where you can try your hand at keeping the grid balanced and operational.

Smart charge points also help to manage this demand by allowing the user to schedule charging to take place during off-peak times or when there is a higher amount of renewable energy available on the grid. This can include giving your energy provider a window for charging and allowing them to dynamically adjust when your smart charge point actually draws down power.

‘Vehicle-to-grid (V2G) is seen as a significant development in the intelligent management and usage of power’

What’s next?

The next step in smart charging is to enable the energy stored in an EV battery to be used elsewhere in the home, by someone else, or to balance the electricity requirement of the grid as a whole.

Known as vehicle-to-grid (V2G) it’s not widely available yet and only works with a very limited number of chargers and vehicles, but it is seen as a significant development in the intelligent management and usage of power requirements at an individual, business, and countrywide level.

There is still more work to be done, much of which is focused on ensuring power is where it needs to be and that infrastructure solutions can be quickly and easily connected to the grid. This includes making use of government initiatives such as the Rapid Charging Fund which supports the development of ultra-rapid charging networks with prohibitively expensive grid connections.

Additionally, the National Grid is connecting an increasing number of renewable energy sources to the grid. This does more than just support the country’s environmental goals, it also delivers increased energy security with greater protection from market shocks originating from outside the UK.

Service and Support

As the number of EVs on the road continues to increase, so does the need for skilled technicians who are capable of safely servicing and maintaining vehicles — including unfamiliar brands. Current estimates put the figure at 107,000 qualified EV technicians needed by 2030, rising to 185,000 by 2035.

The current situation

There are currently c.52,000 certified EV technicians in the UK. That means that just over one in five technicians is qualified to work on an electric vehicle. This sounds as though things are on the right track but, based on the current trajectory, we are still heading for a shortfall by 2032 when we will see a skills gap of 5,670 technicians, a figure that will rise to 30,000 in 2035.

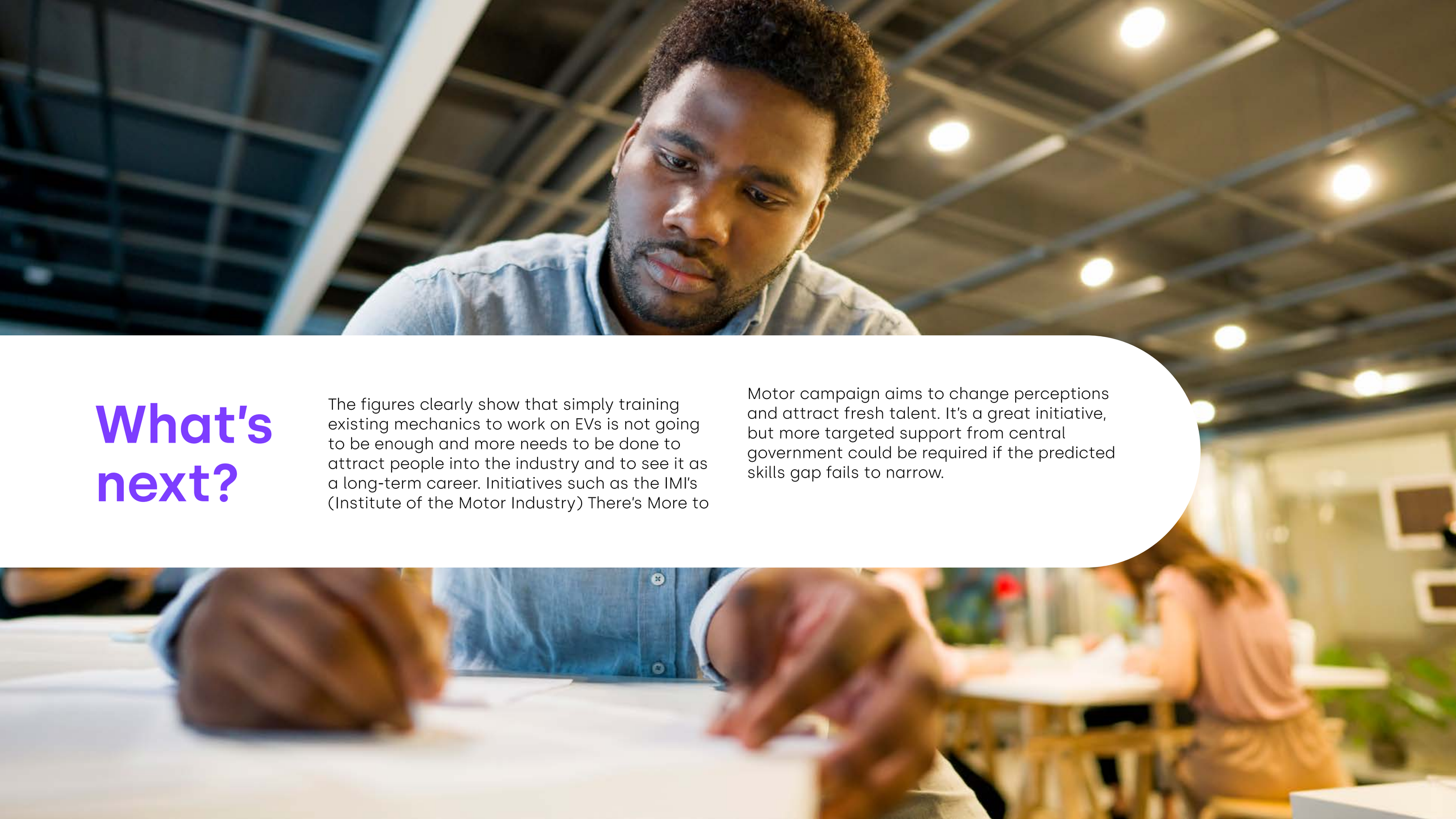
It's clear that challenging economic conditions have put training budgets under pressure and the automotive industry as a whole has struggled with filling vacancies.

As of February 2024, there were 23,000 vacancies in the sector, the majority of which were vehicle technicians, mechanics and electricians.

As with the charging network, it's not just about the big numbers. Drivers and fleet operators need to be confident that their local, or preferred, garage can complete any necessary servicing or repair work quickly, conveniently, and without unnecessary delay.

by 2035

30,000 **EV technician skills gap**

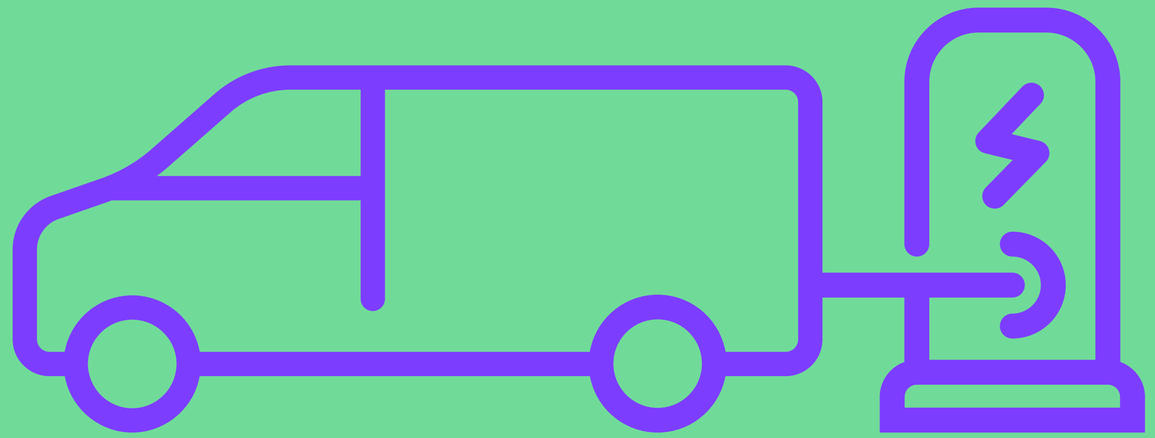


What's next?

The figures clearly show that simply training existing mechanics to work on EVs is not going to be enough and more needs to be done to attract people into the industry and to see it as a long-term career. Initiatives such as the IMI's (Institute of the Motor Industry) There's More to Motor campaign aims to change perceptions and attract fresh talent. It's a great initiative, but more targeted support from central government could be required if the predicted skills gap fails to narrow.

Electric Vans

Vans are not just big cars, and while many of the challenges facing car fleet operators are mirrored in the van sector, there are additional layers of complexity which make switching to electric a unique challenge.

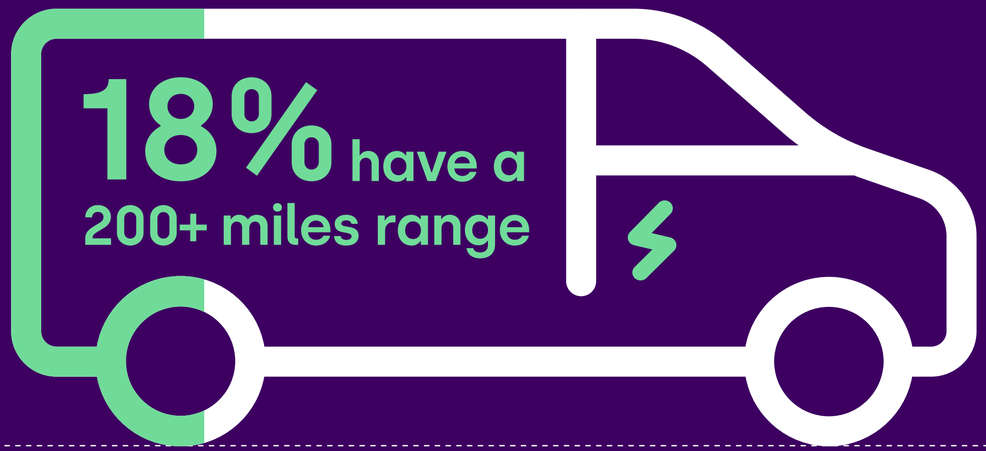


The current situation

Many van operators are struggling to find fit-for-purpose EVs that can do the job, travel the right distance, and cost no more than their current diesel model. Just 18% of electric vans have a WLTP range greater than 200 miles and, given that they are working vehicles with variable loads, the real-world range can often be a lot less.

This is compounded by the fact that relatively few vans support rapid charging, leading to unmanageable levels of operational downtime, and are often taken home at night to locations where off-street parking and home charging is not feasible.

There are also additional complications. To maintain the same level of payload as a traditional 3.5t van, the Gross Vehicle Weight (GVW) of an equivalent EV breaks the upper weight limit for LCVs, resulting in the need to comply with HGV-related statutory requirements; including annual MOTs, speed restrictions, and tachograph compliance (depending on distance travelled and geographical location).



‘**half of van drivers** live in terraced housing and apartments’

What’s next?

Whilst the issues around weight can largely be resolved through legislation, many of the challenges faced by would-be electric van operators will take much longer to fix.

Charging companies need to give greater consideration to the size of their charging bays and, with around half of van drivers living in terraced housing and apartments, van operators are dependent on manufacturers producing a much wider range of electric vans with rapid/ ultra-rapid charging capabilities.

Hydrogen is seen by some as a more viable long-term solution and the new Vauxhall Vivaro Hydrogen van has a range of up to 249 miles, can be refuelled in just three minutes, and has a payload of 1,000kg. Not bad for a model with a starting price of £32K. The only snag is the almost non-existent hydrogen infrastructure.

The final word

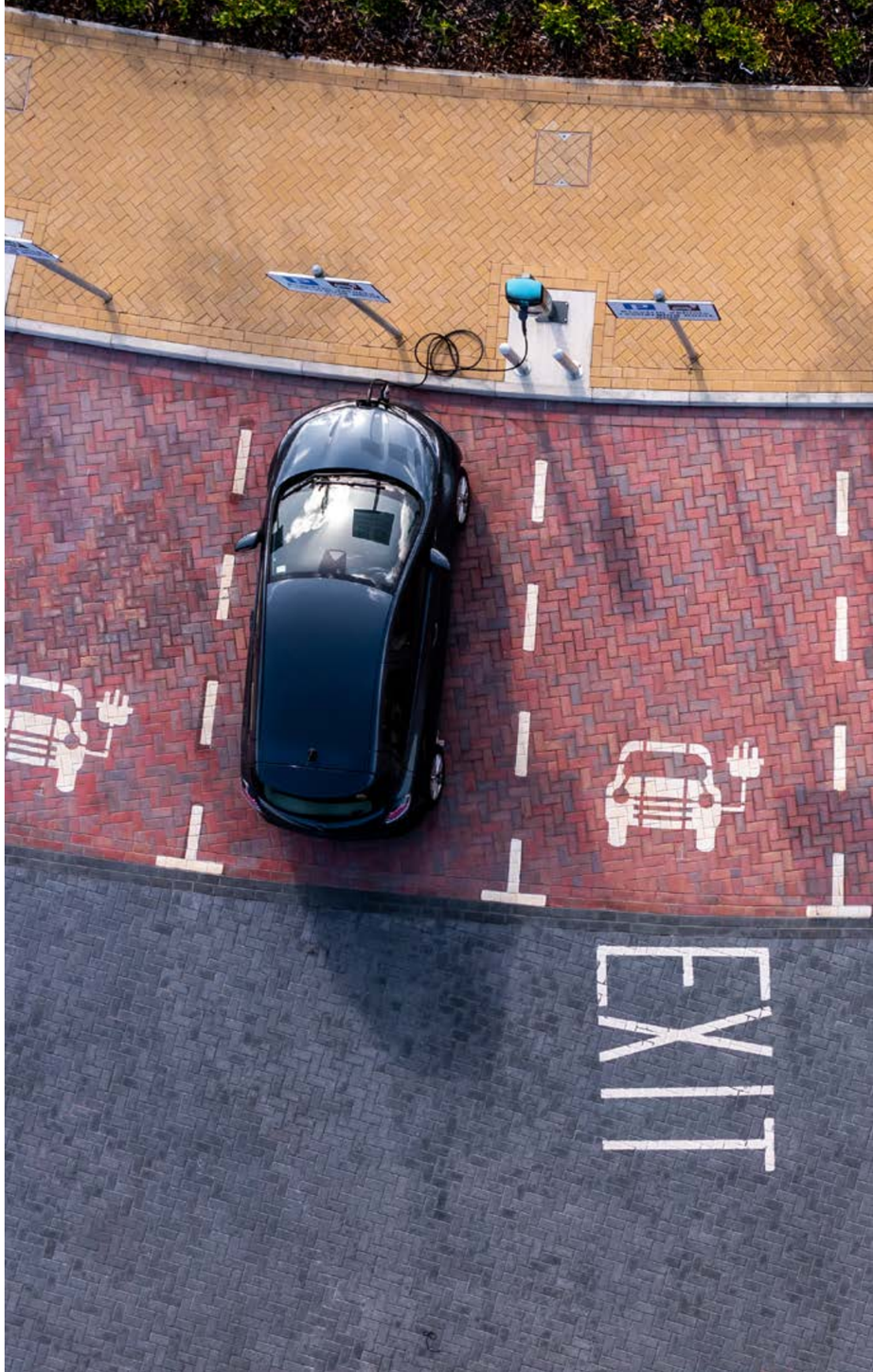
Whenever we take a snapshot on the road to net zero, there will always be some areas which are falling behind and some that are surging ahead. The big question has to be: are we on target to switch off the production of new ICE vehicles by 2035?

Accepting that there will be some more bumps along the way, the answer has to be a definite yes for cars and somewhere between possibly and probably for vans.

2035 is just another step on the journey. Increased competition and economies of scale will mean more choice and lower costs. Continued advances in battery technology will offer faster charging and longer ranges. And a rapidly growing infrastructure will open up the world of EVs to everyone.

There is more work to be done and you can be sure that Novuna Vehicle Solutions will be at the forefront of creating the real-world solutions needed to help fleet operators large and small make the switch.

> ‘Are we on target to **switch off the production of new ICE vehicles** by 2035?’



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