

3 How do **Electric Vehicles** increase drivers' peace of mind in the current crisis?

EVs have played a high-profile role in the UK's political life in recent years. A new way of powering what is essentially the same old device used in the same old way has somehow become one of the most acrimonious fronts in the ongoing culture war between change and being left alone. Misinformation is rife but **for those who make the switch, hardly any go back...**

Just when new EV registrations growth was softening slightly against a backdrop of new taxes and manufacturer pushback on the ZEV Mandate, along comes a geopolitical shock that's fed through into both liquid fuel pricing and availability. This has given a whole new group of drivers reason to look at switching and they are certainly acting – **many national EV portals report a rise in enquiries by up to 50%.**

There are now more mass-market EVs at all price points than there have ever



been before. **Multiple studies are showing annual savings of over £1000 are available to those who can charge at home**, and the proportion of UK drivers who can is growing thanks to innovations such as Cross-Pavement charging. Even the focus around the new 3 pence per mile proposal for EVs has been all but negated by the 3 pence per mile rise in running costs for a 40mpg petrol car since the start of February. There's more good news on the horizon with the recent ruling meaning the 20% VAT Rate on Public Charging could have been incorrect all along, along with recent enhancements to the amounts available for some home and business charge point installations.

Electricity simply isn't subject to the same volatility as petroleum: domestic costs are regulated, and supply is managed entirely onshore. Waking up to a full charge at a known cost is very different to having to queue for a tank of petrol at a surprising price. EV drivers spend very little of their own time charging, going about their day while their batteries are refilled – and that's true of charging at home and while out and about. Predictability has suddenly shot up in consumer value – lower carbon emissions and better air quality will be the welcome outcomes of hard-headed economic decisions that consumers are increasingly taking.

The ZEV Mandate must remain a robust mechanism for driving EV adoption, while improvements to the onshore EV supply chain for both vehicles and batteries must also be made. The recent award of a £380m grant to Tata's Agratas plant in Somerset is a clear statement that the direction is set and electric mobility is here to stay.

How do EVs improve the electricity system, bringing even more security to supply?

"What would happen if everyone tried to charge their EVs at the same time, eh?"

Broadly the same thing that would happen if everyone went out and tried to buy toilet roll, rice, clothes pegs or petrol, frankly, at the same time. We'd run out, of course. But that's not how populations behave and that assertion also assumes no-one is managing the electricity system.

The largest pickup in grid demand in modern times wasn't the 2.8GW at the end of the penalty shootout when England played Germany at Italia 1990 (#2) nor the 2.2GW directly after JR got shot in 1985 (#9) **but the 3GW experienced once the total eclipse of Aug 11th 1999 was over – broadly equivalent to 425,000 EVs being plugged into their home chargers all at once, as the nation went back to work.**

There wasn't a flutter – the system operator knows how populations behave and plans accordingly. Public Holidays, weather, TV shows, sporting events, news events, seasonal behaviour and a whole host of other data get crunched day in day out, and demand predictions are made, generators are engaged, and then fine control occurs in real time. **The idea that EV uptake and usage couldn't be modelled in the same way is fanciful in the minds of those who need them to fail.**

EVs are great for drivers, their wallets, and their local environment, but they can also help the robustness of the grid, instead of threatening it. Having a vast amount of battery storage plugged in and available to balance loads, either by taking power from, or returning it to, the grid, can help the UK reach a 100% carbon free grid, and increase the amount of Renewables on the system previously reliant on coal – a transition where the UK already leads the developed world. The technology is referred to as **“bi-directional charging”, “Vehicle-to-Grid (V2G)”**, or even **“Vehicle-to Home (V2H)”** where the car only supplies the home, and not the grid.



There has been some nervousness among consumers that this activity would shorten the life of the battery. But phone batteries prompting this fear would last a lot longer if they were liquid cooled while charging and discharging, like those in EVs. Also, an EV battery has to cope with full power going out under the vehicle’s full acceleration and then a total reversal of flow as power flows back into the battery via regenerative braking a moment later, and then accel-

There might be dozens of such cycles in even a short journey. Using an EV for demand management using only a few percent of the total battery power capability and 20-30% of its capacity once a day, barely registers, by comparison. What’s even better, is that there is a financial return for doing so. **Less copper in the ground, less construction, less disruption, more energy security.**