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How innovation is transforming the public EV charging landscape

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Insight from Helen Fox-Walker, head of product at Mer

Transport is widely known as being one of the UK's most polluting sectors. It's responsible for a quarter of UK carbon emissions, with road traffic accounting for some 91% of that proportion. It's well understood and documented that the transition to electric vehicle (EVs) is critical to tackling road emissions and to create a net zero future in the UK and beyond. While the problem and the solution are clear, the journey has not always been so simple.

To support the transition to EVs, the UK Government aims to have 300,000 public chargers installed by 2030. However, the public charging infrastructure faces several challenges including legislative, technical and cultural barriers. Are these barriers still as restrictive as they seem and how has the EV industry been innovating to address them?

Addressing power availability and grid constraints

Unsurprisingly, EVs consume considerable amounts of energy, creating issues around grid stability and security, including voltage deviation, frequency imbalance and grid overload. Unfortunately, many EV projects have already experienced delays due to power supply challenges and this issue is particularly pronounced when we consider the demand needed to electrify commercial and industrial fleets.

The truth is the grid requires extensive and expensive upgrades to accompany EV charging developments. These upgrades are an important and necessary part of the entire net zero effort and will be essential to allow more renewable energy to be incorporated into the grid. Plus, there are already promising technological developments in the EV sector to address power supply issues.

Innovations by car manufactures in recent years have led to the creation of larger batteries with longer life spans to reduce the 'range anxiety' that was holding up EV adoption. Coupled with the development of a smart electricity grid, the improvements to EV batteries can actually offer a materially efficient and low-cost way to provide short-term energy storage. Emerging vehicle to grid (V2G) technology allows EVs to not only draw power from the grid for charging but also to give electricity back when it's needed in periods of heightened demand.

In a similar vein, innovations in smart grids have enabled EVs to contribute to load balancing. Load management software can constantly communicate with the electricity infrastructure, charge points, and EVs to reduce the energy drain from EVs during periods of peak demand, easing burden on the grid. At the same time, it optimises EV charging. At a macro level, this can create an equilibrium among power demand across several sites, for example a commercial fleet charging site or a public car park. At a micro level, load management can alter the charging session to a period of time when energy is less expensive – helping businesses and individual households cut costs and emissions.

Thanks to technological innovation, EVs can be turned into flexible assets that support the grid's electricity supply rather than taking away from it.

Changing public perceptions

Unfortunately, EVs have been a contentious topic among the press and in public opinion. While the infrastructure is not yet perfect, it is evolving to meet challenges. Many of the public's main concerns such as range anxiety, slow charging and insufficient charging points, have already been addressed in recent years by innovation.

Charging is getting faster, and rapid and ultra-rapid charge points are becoming increasingly available. The number of ultra-rapid charge points in the UK has increased by 68% since September 2022, representing the fastest growing charger type. Now, EV drivers can easily access a quick and substantial boost when they stop for around 20 minutes. There are also exciting innovations on horizon in the form of wireless charging that will further maximise the ease for EV owners in the future.

A bugbear for many EV drivers in the past has been the lack of simplicity when it comes to finding chargers and payment options. However, new consumer-friendly technology is simplifying the user experience to make the process as seamless as possible. For example, Tap Electric's app helps drivers easily identify chargers that are available, reliable, and affordable. Equipped with availability alerts, real-time cost calculation, and in-app messaging, the app supports a smooth driver experience. Likewise, for fleet drivers, Zapmap and Allstar's Integrated Digital Payment Solution, offers a single-app payment solution for charge points across a UK-wide network. Smart technology also now alerts charge point operations as soon as a charger is out of action to ensure it can be fixed as soon as possible.

An electric future

Innovation remains the driving force behind the transformation of public EV charging networks. There may still be bumps in the road but if one thing is for sure, the EV industry will continue to evolve and innovate to address them. A future where the UK public charging infrastructure is a seamless and integral part of our everyday lives may not be as far off as it seems.

Mer is constantly innovating to support the transition to electric mobility. Learn more about our solutions

here.