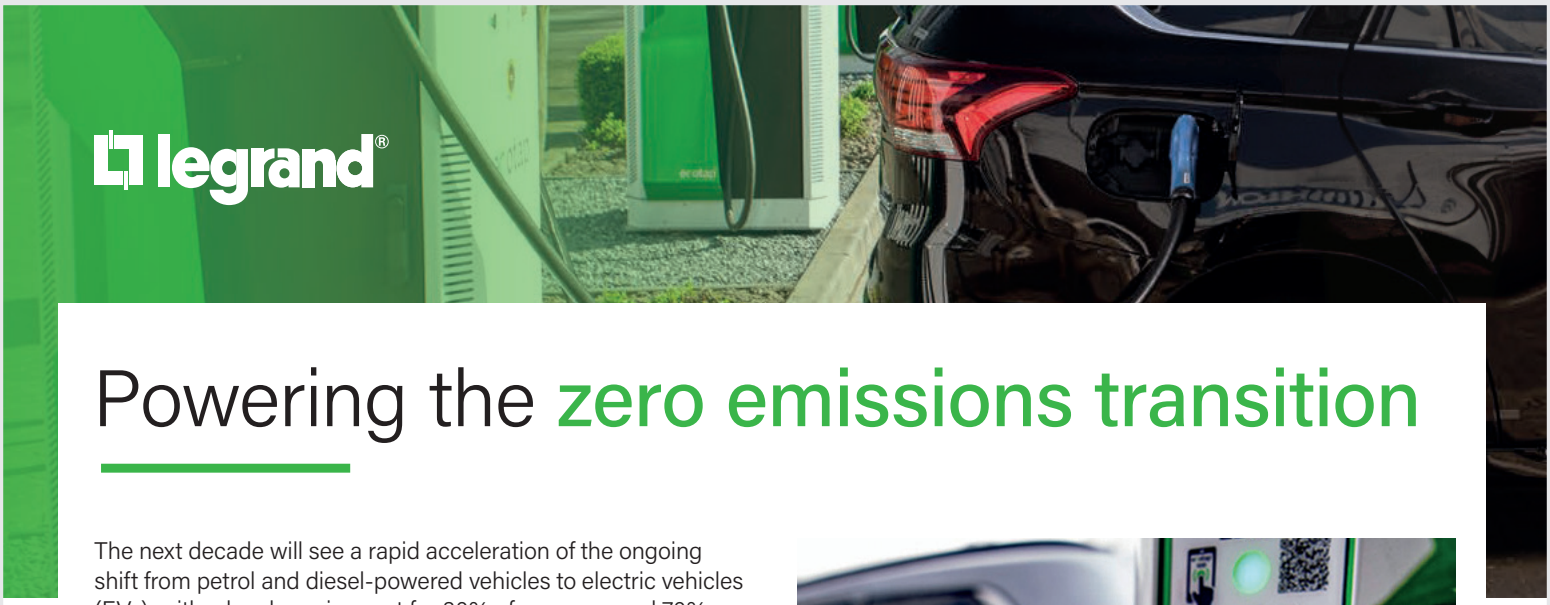


Powering the zero emissions transition

The next decade will see a rapid acceleration of the ongoing shift from petrol and diesel-powered vehicles to electric vehicles (EVs), with a legal requirement for 80% of new cars and 70% of new vans to be zero emission by 2030 and 100% by 2035.

Yet, as things stand, the charging infrastructure needed to power this transition does not exist. A substantial proportion of homes do not have the benefit of off-street parking immediately adjacent to the property, which is needed to install a home charging point. This leaves many drivers reliant on a combination of workplace and public charge points.

Consequently, workplaces and EV charge point operators (CPOs) must play a major role in delivering the transition to zero-emission vehicles. CPOs have several challenges to overcome, including the requirement for contactless payment options at charge points, sufficient power supply and more sophisticated load-balancing software, along with the need to select a supplier that can deliver reliable and interoperable infrastructure.

This paper examines these three key challenges for CPOs in rolling out the level of infrastructure needed to drive the EV transition.

Contactless payments

The Public Charge Point Regulations 2023 require that by November 2024, all EV chargers 8kW and above for use by the public are capable of accepting contactless payments. This is a legislative requirement and CPOs could be fined for non-compliance. The requirement is also retrospective, so chargers already installed at 8kW and above for use by the public must comply.

This is a challenge for the industry. The regulations do not specify which or how many contactless payment methods must be available. They also do not specify what physical form the contactless payment should take. Contactless payment terminals can be positioned within the EV charger enclosure, mounted underneath the enclosure on the same pole or mounted on a separate pole. Moreover, terminals could also be shared between multiple chargers. For example, in a row of EV chargers, payment could be made from a common payment meter, similar to using contactless payment for car parking at a common kiosk. It could also take the form of a payment made inside the building, for example a petrol station or swimming pool. CPOs must ensure that if payment is taken via a manned kiosk, the EV charger can only be in use when the payment kiosk is available. Generally speaking, this means a petrol station would need to be open 24/7 or an alternative contactless payment solution would need to be available.

Clarity on acceptable forms and methods of contactless payments is vital for the industry to ensure ongoing compliance with legislative requirements.

Supply and load sharing

One of the greatest limitations to expanding the EV charging network is the availability of a suitable level of power.

With consumers expecting minimal downtime while EVs are charging, combined with the increasing charging capabilities of cars and the demand for more miles per charge, the strain on the electrical network will increase.

The difficulty for CPOs is that the existing network infrastructure may not be capable of feeding multiple EV chargers at full load.

One option is to upgrade the electrical supply with a new medium voltage (MV) supply transformer and associated switchgear. This can be a very expensive option as, especially in urban areas, the supply cables are likely to be buried and require major groundworks. Additionally, a suitable and safe place to locate the MV transformer needs to be available close to the EV chargers, which can be an expensive and time-consuming process. CPOs need to consider the financial viability of the upgrade versus the additional return on investment from sale of electricity.

One alternative is local load-balancing software. This manages how much power is supplied to each EV being charged at one time. The better systems can be tailored to adjust individual charger supplies depending on several criteria, rather than just being first-come, first-served.

With consumers increasingly expecting the best possible service from charging and infrastructure where upgrading the supply is either not physically possible in the short term or is economically unviable, more sophisticated load-balancing software will become an increasingly important consideration.

Equipment quality and interoperability

The EV charging industry is still in the early stages of development, with the UK behind the pace regarding rapid and ultra-rapid changers compared to the rest of Europe. Installers and CPOs will need to prepare for the increasingly sophisticated technology that will emerge over the coming years.

There will be a strong focus on the ability of chargers to talk to each other in a small local network, harvest data remotely to identify free locations, talk to the Distribution Network Operator (DNO) network for a higher level of load balancing and, of course, to communicate with the CPO remotely.

Some standardised software exists for communication, for example Open Charge Point Protocol (OCPP) software helps installers integrate equipment from different suppliers to provide a functioning solution. However, in the future different tiers of software could well exist that may or may not intercommunicate. It could become a challenge for installers and CPOs to install and manage systems operating different software with upgrades, patches and drivers that may or may not be compatible with all of the CPO's assets.

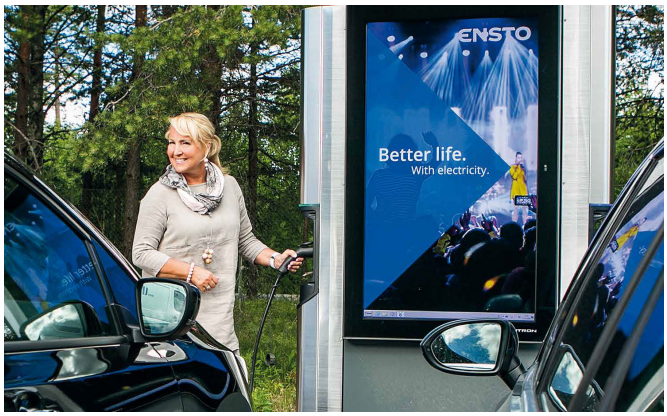
Also, as in any evolving market, there will be different levels of equipment quality. In many cases, the ticket price for EV chargers alone should be weighed up carefully against the value for money and longer-term hidden cost of maintenance and replacement of faulty equipment. This should be considered in relation to clause 7 (2) of the Public Charge Point Regulations 2023, which states "The reliability requirement of the network of the rapid charge points is, on average, reliable for 99% of the time during each calendar year."

Conclusion – next steps for charge point operators

Against the background of long lead times for new and upgraded grid connections, CPOs need to be thinking now about how they will overcome the challenges involved in scaling up infrastructure over the next 10 years, with a series of complex and interconnected issues to overcome.

Legrand UK & Ireland is at the forefront of solutions to deal with these challenges, with an extensive range of charge points and the associated electrical infrastructure equipment available to workplaces and CPOs.

We also provide support and technical assistance for CPOs and installers on a range of issues relating to EV charging and infrastructure with innovative solutions for system designers and specifiers.



Further resources

We offer further resources relating to EV charging on our website, including our EV charging CPD:

CPD:

https://www.legrand.co.uk/en/trainings/ev-charging-an-introduction

EV charging solutions webpage:

https://www.legrand.co.uk/en/solutions/ev-charging

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