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The top challenges EV charging sites need to overcome

At present there is still a policy for all new vehicles in the UK to be electric from 2035. With Labour's win, the target for Internal Combustion Engine (ICE) vehicles will be reinstated to 2030 ahead of the rest of Europe, with the number of EV vehicles on the road currently at just over 1 million. Whilst there is a well-established network of petrol stations for those vehicles, the number of EV charging stations has had to expand rapidly to keep up with demand.

Whilst the availability of charging at home has allowed many to keep their cars topped up, the charging sites open to the general public have been more difficult to obtain, and if that number is to continue to expand then there will have to be some adaptability, and fast. There are some major challenges in acquiring a new roadside rapid charging site that may hold back the ability to deliver the much-required mass roll-out.

Lack of available plots

The most attractive locations are those alongside busy transient roads especially in the main urban areas as this is where demand for charging is likely to be the highest. However, these locations are likely to already be well developed. Those that do come to the market are likely to see strong competition from a number of other similar operators such as drive thru restaurants, car valeting, and the rise of alternative fuels, such as Biogas, makes site finding even more difficult.

Length of lease

The market has generally been looking at leasehold options rather than freeholds and the market requirement is for long lease lengths of 15 to 30 years which is generally longer than most other occupiers would consider. The main reason for this length of lease is the relatively high set up costs. Operators will generally undertake all of the works themselves with the costs relating to both getting sufficient power to site and also upgrading the local power supply.

Due to the high set up costs, the operators are needing significant lease lengths to be able to amortize them. This is causing issues for a couple of reasons. Firstly it rules out a large number of sites that are already let as its likely the head lease will be significantly shorter or will have tenant breaks, so an EV operator cannot be given sufficient security on their lease. Alternatively, even if a sufficient lease period could be available, some landlords will not look to tie up a site for that long especially if is part of a wider development.

Electricity supply issues

As EV adoption increases, we have already seen the demand for electricity rise substantially with it projected to increase more, leading to potential grid overloads, especially during peak charging times. Many electrical grids were not designed to handle the high and variable loads imposed by numerous EVs charging simultaneously. Upgrading the electrical infrastructure to accommodate this new demand requires substantial investment in both the generation and distribution networks. This includes not only increasing capacity but also integrating smart grid technologies to manage and distribute electricity more efficiently.

While the availability for ≤7kW is readily available, it is insufficient for public facilities, especially at motorway services with limited free parking time. For a rapid charging site, the required power is quite substantial. However, in some locations, there is a lack of available supply, either due to insufficient grid capacity or the high cost of extending the supply to the site.

The table below represents the various charging options available to plug-in car drivers based on a 30-kWh battery.

Charge Point Type	Power Transfer		Typical Charging Time	Recommended Location
Slow	≤3kW	Single phase	8-12 hrs	Parking on public streets, in public car parks, leisure facilities, shopping centres and tourist attractions, workplace parking and depots
Fast	≤7kW	Single phase	3-4 hrs	
	≤22kW	Three phase	1-2 hrs	
Rapid	≤43kW	Three phase	80% in 20-30 mins	Public parking, taxi ranks, bus depots and motorway service areas
	≤50kW	DC		
Super-rapid	≤43kW	Three phase	<20-30 mins	
	≤50kW	DC		

Source: UKEVSE

Payback

In a recent case, the Rapleys team assessed a potential EV site alongside the A1 which required electrical upgrades. The only way to get sufficient supply to the site would have been a new connection under a railway line and river, with the initial estimate of costs being circa £4m. On this basis, a site will never be financially viable against the likely level of return. Whilst this is an extreme case we are still seeing connection costs regularly in the £100k plus region. As demand improves, site payback time will decrease but in the meantime, it is a significant negative when considering other uses.

Lack of comprehensive UK-wide Government strategy

To date there has been a noticeable lack of a comprehensive strategy to aid the mass roll out of charging points across the UK. This is underpinned by huge regional disparity – according to Gov.UK, in London there are 210 chargers per 100,000 people but in the North West this number stands at just 49 per 100,000 and in Northern Ireland it falls further to 24. The average in the UK is 80 out of 100,000. With the number rising 45% year on year and our current figures at around 53,000, we can expect the total number of chargers in 2030 to be around 196,100, facilitating 5 m+ predicted EVs on the road in the UK. Is this enough? That's assuming that growth remains at the same pace (+23,850 per year) and isn't hampered by these very challenges.

Summary - Innovation and Government support (fast) needed

The reliance on non-renewable energy sources for electricity generation can offset the environmental benefits of EVs, highlighting the need for a transition to renewable energy to truly capitalise on the sustainability potential of electric vehicles. Addressing these issues is crucial for the sustainable growth of the EV market and the broader goal of reducing greenhouse gas emissions.

Whilst the expansion of sites continues, we are likely to see more innovative solutions to the problems and the market is already seeing some flexibility. But we also need Government support, and that means accelerating the roll out of EV charging points and a strategy/roadmap of how to do so. We only passed the 50,000 charging point mark recently and with Labour's renewed pledge to ban ICE cars by 2030, this needs to rise quickly to facilitate uptake across the country, while initiatives to reduce cost – both for the infrastructure and the consumer.

If you have a site that might work for EV charging or any other roadside use or have questions about EVs then please do not hesitate to contact us. Similarly, our colleagues in Utilities Consulting can provide expert advice relating to connectivity strategy.

To find out more about the impact of EV charging requirements on your site, please contact:

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