

Electric Vehicle Round-up

United Kingdom
Q2 2021

A UK supply chain for batteries and PEMD: Environmental Audit Committee call for evidence

The UK Parliament's Environmental Audit Committee (the "**Committee**") is conducting an [overarching inquiry](#) concerning technological innovations which could contribute to tackling climate change. As part of this, the Committee called for evidence on battery EVs in May 2021, focusing on the UK's manufacturing capacity for the production of batteries and the associated supply chain for power electronics, machines and drives ("**PEMD**") ("**the Call for Evidence**").

The Committee outlines three main reasons to focus on battery technology and PEMD together:

1. Supply chain scale-up is required for EV growth and cost reduction:

the key technological shift from internal combustion engine vehicles to EVs concerns these elements.



2. Economic and technological advantages:

as an evolving area, investment into batteries and PEMD may give investors, not only technological advantages, but also economic advantages that will result in jobs, increased profit levels and reduced emissions.



3. Cost reduction:

due to the weight of batteries and the cost to transport them, locating EV factories close to gigafactories could reduce costs.



The Call for Evidence estimates that, for the UK to serve its domestic market, it will need eight gigafactories by 2040, each with an annual production capacity of 15-20GWh. At present, the largest EV battery manufacturing facility in the UK has an annual capacity of 2GWh.

Further to the Government ban on the sale of new petrol and diesel cars from 2030, it has committed to spend up to GBP 1bn on supporting the electrification of UK vehicles and EV supply chains (including developing gigafactories) and GBP 20m to fund EV research and development. A delivery plan is to be published this year "setting out key milestones to deliver the new phase out dates."

However, the Committee outlines that scaling-up a domestic supply chain presents challenges for sourcing battery minerals. Despite the fact that lithium has been found in Cornwall, the Committee recognises that its extraction brings environmental concerns. Mining for other minerals originating elsewhere, such as cobalt, present further challenges, such as dangerous working conditions. The Call for Evidence highlights that effective battery re-use and recycling may mitigate the need for mining, but recognises that this becomes less economically attractive as batteries become cheaper.

In light of this backdrop, the Committee invited submissions to help it better understand:

- the UK's natural advantages in terms of access to raw materials, renewable energy supply, technological readiness, and IP to encourage development of battery manufacture;
- the action needed to support investment and establishment of UK gigafactories, and growth of associated power electronics, machines and drive supply chain;
- measures the Government should take to ensure that minerals for battery electric vehicles are sourced responsibly;
- how funding should be allocated; and
- how the lifetime use of EV batteries can be extended and how to ensure they are ultimately recycled.

Submissions closed on 21 May. It is hoped that the responses will give the Committee drive to influence Government to provide clear direction to ensure that the UK EV manufacturing scale-up is aligned with the demand created by the 2030 ban.





CMA EV Market Study: no Market Investigation Reference but future remedies package to be proposed

The update below is an abridged version of a CMS Law-Now article which can be accessed [here](#).

On 26 May 2021, the Competition and Markets Authority (the “**CMA**”) published a [second progress update](#) in the EV charging market study and [notice](#) of its decision not to make a Market Investigation Reference.

Background

In December 2020, the CMA launched a market study into the EV charging sector in the UK and invited comments from stakeholders. The market study was a proactive step by the CMA to investigate an emerging market in its infancy and identify potential areas of concern regarding competition. Unlike most other CMA market studies, which examine well established markets with emerging concerns, this study was unique in investigating a nascent sector.

Status of market study

On 1 March 2021, the CMA published the responses to its Invitation to Comment (“ITC”) and provided its first progress update.

Since this first update, the CMA has been continuing to collate information, undertaking analysis and engaging with stakeholders. Of note, it held a series of roundtable sessions in April 2021 where key issues were discussed and potential measures were explored.

The second progress update builds on the segments previously identified and notes emerging issues in the following settings:

- en-route rapid/ultra-rapid charging, in particular on motorways – where concerns about investment and competition exist, given the requirements for suitable, accessible charging locations ;
- on-street slow/fast local charging i.e. on the kerbside or in local hubs – where emerging issues about limited investment to date and the role of local authorities exist; and
- how consumers interact with both off-street home charging and public charging.

The CMA’s exploration of these emerging issues and potential remedies to address them is set to continue for the next few months.



Market Investigation Reference ("MIR")

The CMA noted that the nature of some of the identified emerging issues in the UK EV market are such that it is likely the statutory test for making a MIR is satisfied. However, it decided not to make a MIR as it believes that the issues could be effectively and proportionately addressed through alternative outcomes. Separately, it did not receive any representations from stakeholders that a MIR was necessary.

Instead of a MIR, the CMA commits to "develop a package of remedies within the market study" that it considers will effectively address the issues identified. Whilst the CMA did not disclose the form this package of remedies may take, there are a broad range of remedies it could adopt, including:

- recommendations to Government if it considers that a change in law, government policy or the regulatory framework is required;
- publishing guidance and/or recommendations to businesses if it deems certain issues can be addressed by stakeholders changing their behaviour, this may address issues such as the information provided to consumers during the sales process, avenues for customer redress and poor terms and conditions; and
- customer-focussed action – for example, organising information campaigns to empower consumers to make more informed purchases.

The CMA has left the door open to revisit the case for a MIR should there be features of the UK EV charging market meriting further consideration in the future – but this would be a separate project.

Next steps

The CMA anticipates publishing its market study report, setting out its full findings alongside a package of remedies, in summer 2021 - significantly ahead of the statutory deadline (being 1 December 2021).

The detail, flexibility and extent of the CMA's remedies will be keenly awaited by the fast-paced and growing UK EV charging sector. In its first progress update, the CMA noted it was working closely with the Office for Zero Emission Vehicles so the sector will be hoping for a joined-up approach to any regulation and practical solutions to emerging issues.

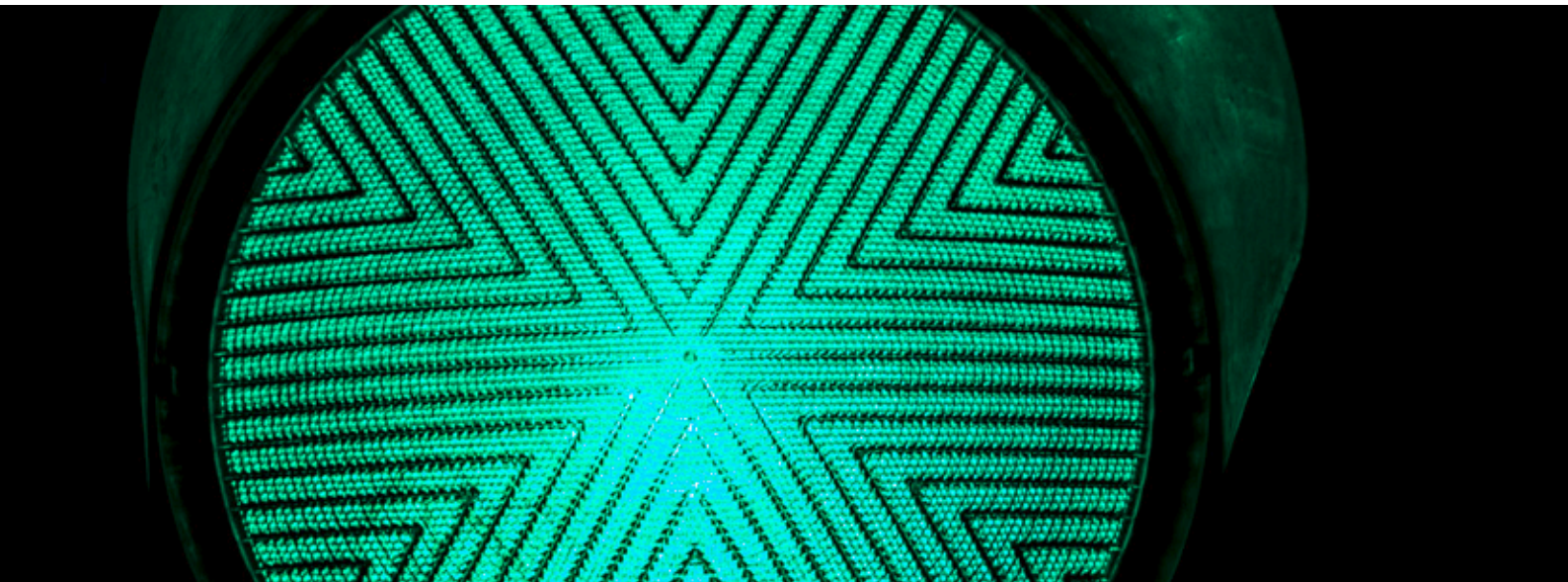


Energy UK report on EV smart charging

On 15 April 2021, Energy UK published a [report](#) assessing the future options for EV smart charging at home and advocated against mandating the use of smart chargers linked to the Data Communications Company (“DCC”) (the “**Smart Charging System**”) as the route to implementation. DCC is the company licensed by Ofgem that is responsible for linking smart home meters to energy suppliers and network operators. It has been proposed that the Smart Charging System would enable network operators to send signals directly to EV smart chargers to control the load on the electricity system.

The report comes off the back of a Department for Transport and Office for Low Emission Vehicles consultation on EV smart charging in July 2019. The consultation proposed to utilise the pre-existing smart meter roll-out via DCC to implement the Smart Charging System. The results of the consultation and any subsequent policy proposals are yet to be published. However, as covered in [our last quarterly round-up](#), it is expected that smart charging regulation will be published in Summer 2021, and will require chargers to have a “customer interface” (which is to be defined) and capable of sending and receiving load control signals. The regulation is anticipated to cover private chargers only (home and commercial workplaces) with depots and destination chargers being excluded.

With this backdrop, the report sets out that with the inevitable rapid growth of EVs, the Great Britain electricity system could face a large growth in electricity demand. The National Grid Electricity System Operator’s Future Energy Scenarios Report, ‘Community Renewables’ predicts that this charging demand at peak times could rise to approximately 24GW by 2050. This demand could be managed and reduced through smart charging technologies, and further reduced by utilising technology that enables power stored in EVs to flow back to the grid. Without utilising some form of smart charging technology, the demand could lead to constraints in local distribution systems and, once a critical mass of EVs in Great Britain is achieved, could have impacts on the national demand and supply balancing.



Energy UK's report sets out the following:

1. Currently, smart charging EVs at home is mainly conducted via a Charge Point Operator ("**CPO**") that optimises charging times in terms of cost, carbon impact, range required etc. through bespoke communication channels. Further, from July 2019, all EV charging points that received rebates from the Government must use smart technology that require them to be remotely accessible, and capable of receiving, interpreting and reacting to a signal or instruction. However, none are currently designed with smart meter functionality that are compatible with the proposed Smart Charging System.
 2. CPOs are resistant to implement proposed Smart Charging System, ultimately believing that it "would inhibit their freedom to innovate and deliver competitive products and services". CPOs have stated that it would reduce their design flexibility, freedom over the level and type of data transferred, doubts that the proposed Smart Charging System could cope with the influx of data, delay routes to market, and frustration over the bureaucracy of having to go through the Smart Metering Commercial Product Assurance regime which is required before connection to the DCC network.
 3. Energy UK proposes some alternatives such as a hybrid system that could combine day-to-day control via bespoke CPO systems with a layer of supervisory control via the DCC in exceptional circumstances (such as a serious grid imbalance) and use of DCC data flows to understand electricity demand.
 4. The report notes that innovation by car manufacturers has provided customers with the ability to manage their charging requirements either via a mobile device app, or through the vehicle's dashboard interface. This has given the customer a seamless end-to-end experience and is providing a viable alternative solution for 'at home' smart charging. This has been dubbed a 'CPO on wheels' and is hoped in the future that the vehicle itself would be capable of controlling charging, reacting to external communications from network operators and the CPO and provide a range of flexible services.
 5. According to Energy UK, industry trials such as My Electric Avenue and Electric Nation have shown that demand control is possible and effective by relying on CPOs to facilitate control of demand at the charging point without using the DCC.
 6. The report also notes that implementation of draft British Standards Institution (BSI) standards PAS 1878 and PAS 1879 for energy smart appliances would help mitigate cyber security, interoperability and grid protection risks associated with non-DCC options. Energy UK believes adoption of these standards should be encouraged from the outset, with a clear focus on them helping ensure that Government objectives are met in relation to consumer uptake, innovation, grid protection and consumer protection.
- Energy UK concludes that there are alternative viable options for delivering EV smart charging at home that sit outside of the proposed Smart Charging System. However, it also noted that work is needed to ensure that these options provide the necessary consumer and electricity grid protections at scale.

EV Innovation

Technology trials



In April 2021, UK Power Networks (“**UKPN**”) [reported](#) that over 500 electric vehicle chargers could be connected to a single electricity substation using state-of-the-art AI technology.

The finding came after a successful trial using an artificial intelligence simulation to test Active Response software on a substation in south London.

UKPN is now preparing to trial the system on the live electricity network. The Head of Customer Service and Innovation at UKPN stated that to meet net zero “we need to facilitate millions of electric vehicles and heat pumps and work even faster to connect more renewables”, with the AI trial showing that the future can become a reality and that “intelligent innovation can have a multiplier effect”.

Introduction of extreme fast battery technology



Battery company StoreDot has developed “extreme fast” battery technology that would allow EV owners to charge [in five minutes](#). The aim is to address the anxiety of recharge times for EVs, which remain much longer than the time taken to fill a car with fuel

StoreDot announced that the first five-minute batteries will be made available for testing this year, with mass production being started in 2024.

Depending on the size of the battery and the speed of the charging point, most EVs can take between 30 minutes at an ultra-rapid charger and 12 hours at a home slow-charger to charge.

3D printing for batteries



Sakuu Corporation has [announced](#) the world’s first 3D printer for EV solid-state batteries. The technology could lead to lower cost, higher production and greater performance of the battery packs.

Sakuu Corporation is a specialist in automated multi-process additive manufacturing. The company claims its printers are 50% lighter and 20% smaller than traditional LiOn batteries. It can use recycled ceramic and metal instead of fresh materials, reducing the battery’s overall environmental footprint.

Creation of superhubs and Zero Emission Zones



An EV charging hub will be opened by Pivot Power, part of EDF Renewables, in Oxford that is described as the [most powerful in Europe](#). The Oxford Superhub will be located at Redbridge Park & Ride and will contain 38 fast and ultra-rapid chargers – making it the UK’s largest electric vehicle charging hub. Of these 38 chargers, 10 will be from Fastned, 16 from Gamma Energy and 12 will be Tesla Superchargers.

The charging hub will remain open 24/7 and include an on-site cafe. The site is the first of 40 UK sites planned by Pivot Power. This news comes as Oxford prepares to launch the UK’s first Zero Emission Zone in August this year.



Consumer attitude shift to EVs and incentives

The [results of a recent survey](#) by Ofgem has found that EV owners are “more open” to embracing changes in how they use their energy, with 60% of EV owners also saying they would consider smart charging their vehicle to avoid times when electricity is most expensive.

The Ofgem survey also revealed that 24% of consumers are planning to buy an EV or a plug-in hybrid electric vehicle in the next five years. The main concerns from the 38% of respondents who said they are unlikely to get an EV during this time included high EV prices, short EV ranges and the inability to charge EVs close to home.

Public Accounts Committee scepticism over 2030 target

The Public Accounts Committee (“PAC”) has [stated](#) that the UK has a “mountain to climb” to meet the target of phasing out all new petrol and diesel cars and vans in 9 years and hybrid cars and vans in 14 years. It added that there is “no clear published plan” to meet the target and the Committee was not convinced the method of expanding the infrastructure had been “sufficiently thought through”.

It found that EVs are the fastest growing sector of the car market but still only made up 11% of new registrations – to make this 100% in 9 years would be a “huge challenge” requiring prices to fall and infrastructure rolled-out quickly.

PAC raised concerns that the up-front prices for EVs are too high with questions also surrounding how the Treasury would “wean itself off carbon revenues” raised from road transport. Further criticisms included that the Treasury and HMRC have focussed too narrowly on tax revenues as opposed to how these can be used to drive the transition to net zero.

Ofgem invests in electricity network to facilitate charging point roll-out

On 24 May, Ofgem announced its approval of a £300 million investment programme for Distribution Network Operators (“DNOs”) to upgrade Britain’s energy networks and support low carbon heat and transport. In the next two years, part of this package will be devoted to improving the resilience of the electric vehicle charging network and expanding grid capacity at motorway service areas (“MSAs”). The investment is part of Ofgem’s Green Recovery Programme and is the outcome of a call for evidence from Ofgem and submissions of investment proposals from each of the DNOs in February 2021. It will be funded by levies on consumer energy bills, although according to Ofgem, half of the amount will be met from pre-approved projects that ended up cheaper than anticipated.

In particular, the funding is designed to support the development of:

- new infrastructure and cabling for 1,800 new ultra-rapid (100kW+) charging points (“CPs”) at MSAs and key trunk road locations (tripling the current network); and
- 1,750 CPs in towns and cities.

Higher power CPs such as ultra-rapid chargers provide convenience to drivers with dramatically reduced charging speeds (important for places with high throughput such as MSAs) but they are costly to install in remote locations due to a lack of network infrastructure. There are currently 1,017 ultra-rapid (100kW+) CPs in the UK. By 2023, the UK Government’s target is to have at least 6 high powered, open access CPs (150kW+) at every MSA in England.

The funding is hoped to improve the infrastructure network, accelerate installation and, in turn, alleviate consumer EV range anxiety and encourage EV up-take. According to Ofgem’s research, 36% of households that have no intention to purchase an EV are deterred by the lack of CPs near their home. It is worth noting that under the EU Clean Energy Package (which has been transposed into UK law and retained after Brexit) DNOs are prohibited from owning, developing, managing or operating EV CPs except for their own use or unless Ofgem has approved an open tendering process. Therefore, this funding is for improving grid capacity only and not for the installation of CPs.

VAT Liability for electric vehicle charging through charging points in public places

HMRC has clarified that supplies of EV charging are currently charged at the standard rate of VAT (20%) and that there is no exemption or relief. The note provides needed certainty for the industry as some Charge Point Operators had been charging a lower rate of VAT at 5% by relying on the de minimis provision.

The de minimis provision

There is a reduced rate for VAT (5%) for supplies of small quantities of electricity (de minimis). This only applies if the supply is:

- ongoing;
- to a person’s house or building; and
- less than 1,000 kilowatt hours a month.

This does not apply to supplies of electric vehicle charging at charging points in public places.

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