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Electric Vehicle Round-up

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EV Industry Bodies launch Future of Smart Charging Report on the status of UK smart charging requirements

BEAMA and Energy UK have released "The Future of Smart Charging" report, summarising the outputs from their working group discussions over the period October 2021 to May 2022.

The Future of Smart Charging project (the "**FSC Project**") was initiated by the industry bodies in July 2021 with the aim to help stakeholders, such as the Government, to understand the options for delivering the interoperability and cyber security of smart charging devices and systems, while providing required levels of data privacy and grid stability.

Background
The Automated and Electric Vehicles Act 2018 gave the Government powers through secondary legislation to mandate that all EV chargepoints sold and installed in the UK have smart functionality and meet minimum device-level requirements. Following the Government's 2019 consultation for smart functionality at EV charging points sold or installed in the UK, the Government responded by mandating minimum device-level requirements for private chargepoints, through the introduction of the Electronic Vehicles (Smart Charge Points) Regulations 2021 (Phase One) and recommending further (Phase Two) proposals during 2022 (see our Law-Now on this here). In addition to this, the Government sponsored the British Standards Institute ("**BSI**") to develop and publish two publicly available specifications of relevance, PAS 1878 and PAS 1879, which together define an energy smart appliance (such as a smart EV chargepoint) and a demand-side response ("**DSR**") system (for high power devices such as EV chargers or heat pumps), to impose high requirements relating to cybersecurity.

The FSC Project's primary objectives are to establish a partnership with the Government on specific minimum requirements for smart charging systems, notably in relating to achieving interoperability, cyber security, grid stability and data privacy; and to explore the viability of a framework for smart EV charging in domestic and small business buildings that deliver system and user outcomes to meet the Government and industry standards. Under Phase 2 of the Government's smart charging work, it will look to mandate these minimum requirements by the end of 2025.

A second arm of the FSC Project includes how to undertake an assessment of compatibility of existing industry standards and specifications, including PAS 1878 and PAS 1879. The FSC Project aims to deliver feedback directly to the Government and to set out the core of the technical framework to deliver the Government's Phase 2 smart charging requirements. The report covers a variety of considerations to demonstrate how the smart charging system is changing. Alongside the system considerations, the report considers the consumer experience and the market context.

Interoperability
The report considers the minimum requirements of EV chargepoint DSR interoperability, to ensure the best possible consumer experience, while avoiding unnecessary cost increases or constraints to market development. The report's key recommendations to consider further are:

— That the Government should not define the specific delivery requirements of the interoperability experience, currently PAS 1878 and PAS 1879 have a broadly defined requirement to address this;

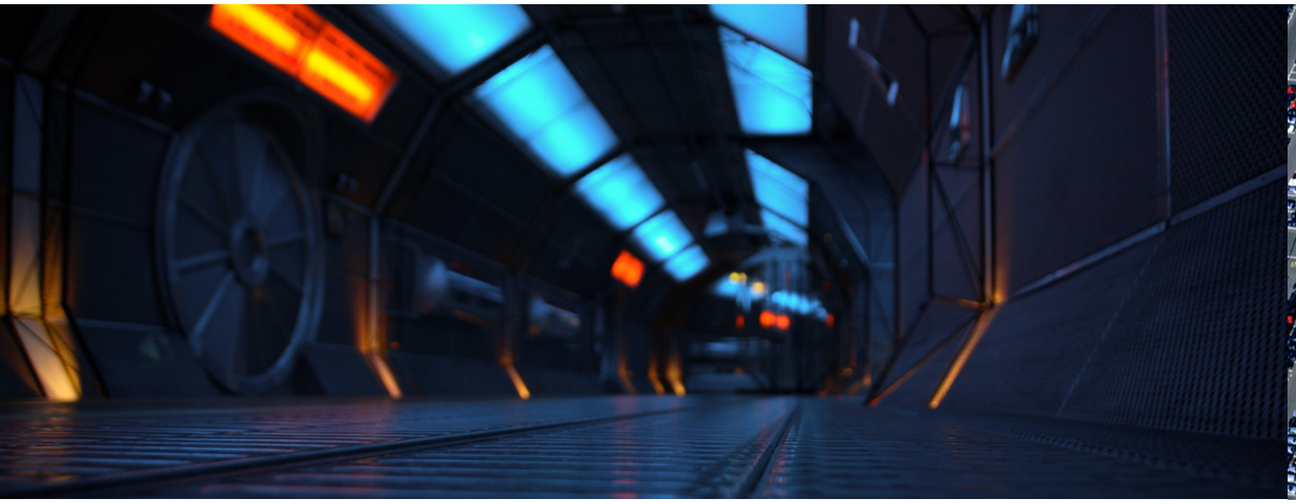
— Guaranteeing the best possible consumer experience by ensuring simplicity and transparency of the process of switching to a different DSR service provider, without adjusting EV charging equipment or a site visit; and

— The industry needs to take steps to ensure that different mechanisms for interoperability are compatible and ensure they can cohere around a universal approach.

Cyber security
The report measures three generic models to implement a cyber security authentication standard, relating to a Public Key Infrastructure ("**PKI**"):

1. a centralised body providing PKI which manufacturers and service providers must use, similar to the requirements of IEC 15118;
2. a central body as a root certificate authority; and
3. a licensed/approved vendors model.

The project scrutinised each model in terms of its likely benefits against likely costs and time implications, as well as other factors but recommends that further thinking is required.



Grid Stability
The report reviews which chargepoint-specific solutions would be best to protect the grid from identified risks while not adversely affecting the price of a charging equipment. The report recommendations include:

— taking an evolutionary approach to solutions over 'day one' requirements as charging demand and the charging system will develop as the EV network evolves;

— the Government has already mandated a randomisation function in smart chargepoints, and therefore already provides a near-term solution;

— modelling, mapping, and trialling process to identify and map responsibility for long-term solutions; and

— recognition that the industry will need impact assessments and a commitment from the Government to engage with key stakeholders on medium to long term solutions due to the cost and technical implications.

Data Privacy
The report considers, with the expectation that current UK GDPR may fall short of the full scope of data privacy protection required in the new smart charging environment, where and how these likely gaps in the framework will arise. The report recommends:

— forming a dedicated working group to test the solutions in line with the Governments cyber security requirements;

— advancing work into communications protocols suitable for smart energy management;

— reviewing the existing Smart Meter Data Access and Privacy Framework;

— that data sharing on the 'state of charge' of an EV may be beneficial to understand the technical limits of flexibility the individual charger can provide; and

— further consideration as to whether a locational tag can be attached to all the information leaving the charger.

UK EV Sales impacted by rising prices

The number of drivers that want their next car to be electric rose from 10% last year to a record 14%, however increased charging costs (particularly at public chargers), and economic uncertainty caused by soaring inflation is expected to challenge the market.

RAC Charge Watch has highlighted the impact of the energy crisis on EV charging costs across the UK, as a result of the significant increases in wholesale gas and electricity prices. Since May, the average costs of charging EVs at a public charger has risen 42% to 63.29p/kWh and 25% to 63.94p/kWh for ultra-rapid chargers with further increases expected.

The increases also bring into focus the growing disparity between charging EVs at home compared with charging with public charges. Following the implementation of the Energy Price Guarantee from 1 October, it is estimated that, for home-charging, the cost of electricity per mile for an average-sized EV driven reasonably efficiently will be 9p and the cost to charge a car to 80% will be £17.87. Whereas it is estimated that, for users of rapid or ultra-rapid chargers, the cost of electricity per mile will be 18p (up from 13p in May). The cost to charge a car to 80% will be £32.41 (a 42% increase from £22.81 in May and 72% increase from £18.81 in September 2021) using a rapid charger and £32.74 (a 25% increase from £26.10 in May and 87% increase from £17.51 in September 2021) using an ultra-rapid charger.

The FairCharge campaign is urging for VAT rates to be set at 5% for both domestic and public charging (currently VAT is at 5% for domestic charging and 20% for public charging). Such a decision could reduce the cost of charging an EV to 55.38p/kWh (reduction of 7.91p) for rapid chargers and 55.95p/kWh (reduction of 7.99p) for ultra-rapid chargers. Such a move may abate the deterrent of rising charging costs to an extent, but a significant disparity will remain between domestic and public charging costs.

Government consults on **Demand Side Response interoperable standards**

The UK Government ran a consultation on the interoperability and cyber security of energy smart appliances and remote load control. It covers many of the areas discussed in the BEAMA and Energy UK report (covered above). It aims to ensure that larger domestic-scale energy smart appliances ("**ESAs**"), including EV chargepoints, batteries, and heating appliances (such as heat pumps) are interoperable with DSR service providers, using ESA standards. It proposes the following requirements:

- require all organisations capable of remotely controlling loads of more than 300MW in aggregate to comply with the Network and Information System Regulations and using the Cyber Assessment Framework;
- require energy suppliers to make time-of-use-tariff data openly available in a common format, accessible over the internet;
- require smart heating appliances and batteries to meet cyber security and grid stability requirements (similar to those already in train for EV chargepoints);
- require electric heating appliances with the greatest flexibility potential to have smart functionality; and
- establish a proportionate and flexible licensing framework for organisations providing DSR to domestic and small non-domestic consumers.

Government consults on **new technologies in the Capacity Market**

The Government ran its yearly consultation to determine whether any new generating technologies, which could participate in future Capacity market auctions, have emerged since the Government conducted its last consultation on the topic in 2021.

In the previous Consultation, stakeholders identified vehicle-to-grid ("**V2G**") as a new technology which is not currently listed as a Generating Technology Class ("**GTC**") in the Capacity Market, which may be able to contribute to security of supply in Great Britain.

The current Consultation noted that an emerging technology which might be eligible to participate in the future Capacity Market auctions, is the Vehicle-to-X ("**V2X**"), (where X could represent the home, a building, or the grid) which is designed to enable the export of energy from EV batteries. The technology is currently undergoing worldwide trials but is not yet in mass commercial deployment. A call for evidence was previously published on the potential role of V2X, and this Consultation seeks to see if there are any further developments in the technology that could bring it closer to contributing to the security of supply.

Test for grid balancing using V2G technology

Octopus Energy and the National Grid Electricity System Operator ("ESO") have run trials using a test Balancing Mechanism to show that EVs could receive direct signals from ESO to help balance the energy system in real time. Such findings demonstrate that EVs are able to store and export green energy back to the grid when required with V2G technology.

The trials involved charging up to 20 EVs during occurrences of grid imbalances and, based on the results, one million EVs could generate the same amount of power to export to the grid as 5,500 onshore wind turbines over the course of an hour.

The trials have demonstrated potential benefits for EV users from such grid balancing. Customers that participate in the V2G scheme could benefit directly through reductions to their charging bills based on the levels of profits realised as a result of scheme.

Aviva Investors invests £110 million in Connected Kerb

Aviva Investors announced that it is to invest up to £110 million in Connected Kerb, the UK-based EV infrastructure company. The investment will support Connected Kerb's plans to deliver 190,000 on-street EV chargers by 2030.

The partnership also aims to install 4,000 on-street chargers by the end of 2022, accommodating the need for greater accessibility to charging infrastructure.

As part of the deal, Connected Kerb will also deliver EV charging infrastructure across Aviva's pan-European real estate portfolio, which includes over 300 major owned assets in the UK.

Connected Kerb have been selected for a new project in New York City, designed to promote public access across the city.

For Aviva, the investment will boost its ESG values across its major assets, providing a means to decarbonise its portfolio.

SSE opens charging hub in Glasgow

As part of its broader aims to build a network of EV charging stations throughout the UK and Ireland, SSE Energy Solutions has opened its first ultra-rapid EV charging hub in Glasgow. The 150kW hub can accommodate larger batteries and contains six bays powered by traceable renewable energy. It is hoped that the location on Castlebank Street in Glasgow will be convenient for both residents and fleets to charge existing EVs or encourage the transition to EVs.

The installation of this ultra-rapid EV charging hub represents the first step in SSE Energy Solutions' initiative to launch 300 hubs across the UK and Ireland over the next 5 years.

EU follows UK's EV sales requirements

As part of its commitment to ban the sale of new vehicles with petrol and diesel engines by 2030, the UK government introduced the requirement for all new cars and vans to be fully zero emission at the tailpipe by 2035. The EU has recently established a policy with the same outcome, known as "Fit for 55". The EU policy differs in that it plans to achieve zero CO_2 emissions from new cars and vans in two stages, the first being a 55% reduction in CO_2 emissions in new cars and 50% in new vans by 2030 (compared with 2021 levels). Then, similarly to the UK, a 100% reduction by 2035. This is a significant progression from the existing EU regulations which require each manufacturer to maintain an average emissions target of 95gCO_2/kg over its fleet or face a premium of €95/ gram CO_2/km.

The agreement maintains an incentive for manufacturers to produce low- and zero- emission vehicles through offering more lenient CO_2 targets where manufactures have sold a certain amount of low- and zero- emission vehicles as a proportion of their fleets (25% for cars and 17% for vans until 2030). Additionally, the policy provides that a review should take place in 2026 ensuring that appropriate progress has been made with respect to emissions reductions.

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