LowCVP Secretariat response to

Smart, Flexible Energy System call for evidence, January 2017

The Low Carbon Vehicle Partnership (LowCVP) was established by UK central government in 2003 specifically to accelerate the uptake of low carbon vehicles and fuels. The LowCVP is a well-respected and highly effective public-private partnership with nearly 15 years of experience and success working directly in this area and is a strong advocate for the progressive electrification of many aspects of transport where most appropriate. Around 200 organisations are currently engaged in the LowCVP from diverse backgrounds including automotive and fuel supply chains, vehicle users, academics, environment groups and others. The secretariat and membership are fully committed to supporting this continuing agenda and welcome both the opportunity to contribute to the BEIS and Ofgem Smart, Flexible Energy System call for evidence and to provide specific information and advice to assist preparing an electric vehicle-ready energy system.

The LowCVP, as the co-ordinator of the EV Network Group and a member of the Smart Power Industries Alliance welcomes the call for evidence on a Smart, Flexible Energy System. This is a positive step in helping to decarbonise the UK energy systems at the lowest cost, and benefit the public through lower bills, but further significant work is required to ensure an electric vehicles work optimally with the energy system and transport demands

Power companies and investors need a firm, unequivocal signal from government and regulators that they are committed to a smart energy future. They also need policy stability to provide the conditions to stimulate both the innovation and investment necessary for progress.

The LowCVP has established the EV Network Group, along with EA Technology, and with the support of the Office for Low Emission Vehicles (OLEV).

In providing our response, the LowCVP has focused on the aspects of the call for evidence which relate to ultra low emission vehicles (ULEVs), consumer engagement in Demand Side Response (DSR) and innovation. The response has not been comprehensively consulted via our members and is therefore the view of the secretariat team based on extensive ongoing dialog with our wide range of stakeholders.

Key points:

Electrification of road transport vehicles provides both a significant challenge and huge opportunity to develop and enhance an intelligent energy system. The Industries are in prime position to lead the engagement of consumers with smart energy management and low carbon transport but are also concerned that the leading (and still fragile) Electric Vehicle (EV) market could be impacted if there is consumer backlash to smart energy systems and “managed” demand side response.

The EV Network group has been created to help collaborate across traditional boundaries in order to get the maximum transition to EV miles in road transport at minimum cost and impact to society and industry

The EV should be positioned as one of the key elements in a smart home where the consumer is able to take a proactive interest and management of domestic energy consumption.

Consumers should be able to opt in or out of DNO managed charging control and should also have an ability to select compatible domestic appliance operation in a similar way, to enable personal choice on where energy should be allocated in the home.

Research has shown that currently very extreme electricity price signals are required to encourage EV users to make behaviour choices, due to the savings made versus using petrol undermining the incremental savings of a lower electricity tariff. It may therefore be necessary to have much larger tariff differences in the early years to encourage uptake and engagement. As fossil fuel use declines greater interest is taken in the potential for electricity savings through smarter use.

Battery capacity of EVs is increasing rapidly (60kWhr now available in a family car EV (GM Bolt) which provides a challenge for domestic supply v customer expectations. Currently we expect 7kW to be the sensible domestic charger limit, however it is likely that homes with multiple EVs will have multiple chargers

4. A system for the consumer

Ultra Low Emission Vehicles

Q 33 How might Government and industry best engage electric vehicle users to promote smart charging for system benefit?

The decision to purchase an EV is driven by many considerations. Home charging is considered but to our knowledge there is very little consumer information regarding smart chargers

The most effective point for Government and industry to promote smart charging to electric vehicle users would be during the electric vehicle purchasing process through collaboration with existing campaigns, for example the broad Go Ultra Low campaign for high level messages, then leading to the specific manufacturer websites.

The purchase or lease of a battery or plug-in hybrid electric vehicle is an important decision for a vehicle operator, whether they are a private individual or fleet manager. As part of the decision-making process the potential electric vehicle user will need to consider the charging of the vehicle and potential installation of a charging post. This is a learning experience as well as a decision making process and offers an opportunity to promote smart charging and broader smart energy management at the same time while a captive and interested audience.

Evidence from the My Electric Avenue project indicated that residential electric vehicle users became more engaged and more aware of the electric network operation as a result of their use of the recharging infrastructure.

The Go Ultra Low campaign, run jointly by government and industry, provides information sources to encourage the purchase of electric vehicles, and a ‘one-stop shop’ for provision of information to potential electric vehicle purchasers including information on chargepoint installation and procurement. Currently this makes no mention of smart charging although it does recommend moving to an eco-tariff. The inclusion of information on smart charging would be a natural extension to the information provided.

Q 34 What barriers are there for vehicle and electricity system participants (e.g. vehicle manufacturers, aggregators, energy suppliers, network and system operators) to develop consumer propositions for the:

- control or shift of electricity consumption during vehicle charging; or
- utilisation of an electric vehicle battery for putting electricity back into homes, businesses or the network?

All EV's on sale provide some functionality to control the charging time, wither via connected apps or in vehicle selections. A challenge with thrse has been that initial interest and engagement seems to wear off and drivers find it easiest to just plug in the vehicle whenever it is parked at home.

The EV Network Group is conducting a review of existing projects into electric vehicles and the electricity network. There have been a number of trials and demonstrations looking at the technical issues relating to controlling the timing of electric vehicle charging and utilising the vehicle battery as an energy store for use by the network or premises the vehicle is being charged at.

There has been less effort been put into investigating business models and engaging electric vehicle users in smart charging. There is also a lack of agreement on whether the focus of control should be on electric vehicle charging or the electricity consumption of the premises the vehicle is being charged at.

The My Electric Avenue project investigated the acceptance by electric vehicle users of the ability of the DNO to curtail the charging of an electric vehicle in order to protect the local area network. The reported results were that electric vehicle users involved in the trial were not significantly inconvenienced or caused an unacceptable loss of service, with the majority declaring themselves comfortable or very comfortable with the level of control. However, a key attribute of vehicles today is the immediate availability of transport service on demand. A requirement which few other appliances are required to perform. The range of vehicles (BEV thru to PHEV) and battery capacities provides a very wide choice for consumers but there are limited "simple" options.

A model of electing to participate in managed charging as a default with a simple override for occasions when immediate charging is needed may provide the simple solution for a mass market.

V2G or V2H are in very early trial stages but are showing promise in technical performance. There remain significant questions over the business need for this at a domestic level (over just a managed charge system) due to;

Rapidly decreasing battery cost may enable fixed domestic storage at a reasonable cost which would provide a much more stable option for domestic energy management.

Typically the peak energy consumption time will coincide with the point at which battery is at its minimum SOC (return from commute) or at the time the EV is being disconnected (start of commute) hence the potential is diminished.

In the very long term (2040 timeframe) it is expected that consumers will consider transport on demand service and be less include to own a vehicle. This model will alter the availability of large number of vehicles to be plugged in during the peak demand hours

Consumer Engagement with DSR

Q 39 When does engaging/informing domestic or smaller non-domestic consumers about the transition to a smarter energy system become a top priority and why (i.e. in terms of trigger points)?

In order to protect the network at minimal cost will require electric user acceptance of DSR of some form in the medium-term. However it is vital to present the management of charging as a key benefit now in order to engage the early adopters and not just try to implement something later onto the mass market

The deployment of electric vehicles and the associated charging of these vehicles is expected to place the first significant increase in load on the local electricity network. In the short-term this will deliver a challenge to local network security through clusters of vehicles being charged through the same sub-station. If consumer operated smart chargers were made the norm now the principle of not charging at peak times (voluntarily) can be established early and the external control of this only implemented as a last resort when numbers increase of cluster begin to strain the network

The last three years have seen an increase in registrations of electric vehicles in the UK – new registrations of plug-in vehicles increased from 3,500 in 2013 to around 28,700 in 2016. There are approximately 85,000 plugged-in vehicles on the roads in the UK today., however sales of pure EV's have plateaued and the growth in PHEVs has been predominantly in small battery low range models. Arguably these smaller batteries present an opportunity to implement managed charging with minimum impact to consumers due to the limited time required to fill the battery. If very strong price signals were given now, acceptance of this may pave the way for future wide scale and standard implementation

6. Innovation

Q 47 Can you give specific examples of types of support that would be most effective in bringing forward innovation in these areas?

Smart power companies and investors need confidence to invest in smart innovation. A firm and unequivocal signal from government and regulators that they are committed to a smart energy future is necessary. In addition, policy stability will allow business confidence to be maintained. These conditions will help to stimulate both innovation and the investment required. There is significant scope to engage app developers in contributing to smart energy systems if the chargers and domestic appliances (possibly vie intelligent socked adapters) could adopt a common smart home protocol and interface directly with a truly smart metering system. The current smart meters do not currently appear to provide a platform for smart home implementation

Q 48 Do you think these are the right areas for innovation funding support? Please state reasons or, if possible, provide evidence to support your answer.

The LowCVP would support further innovation funding to demonstrate the role vehicle-to-grid could offer to support the electricity network at larger scale than has been undertaken to date.

Further investigation into business models and electric vehicle users' acceptance of smart charging in order to develop effective consumer propositions would also be considered and desirable

LowCVP is ideally placed to consider the consumer information aspect of the benefit of EV and home interfaces based on our previous work on Low carbon car consumer information and communications

Experience from the automotive sector indicates the importance of providing support for innovation along the whole innovation process and having consistent incentives in the market to help in its support.

LowCVP would be very willing to engage directly with all parties to develop the points and information provided in this call for evidence.

On behalf of the Low carbon vehicle partnership

Andy Eastlake – Managing Director