Preparing for the electric vehicle revolution

What is the background?

Electric vehicles (EVs) are a key component of the transition to a smarter, cleaner energy system — both in terms of their impact on our energy networks and the opportunities they create for managing the grid in a smarter way that is cheaper for bill payers.

The Government has committed to banning the sale of new petrol and diesel cars and vans from 2040.

The number of electric vehicles on UK roads has grown from 3,500 in 2013 to approximately 146,000 plug-in cars and 5,200 plug-in vans today.

What has been happening so far?

Our energy networks are well placed to manage an uptake of electric vehicles as part of their commitment to building the smarter, cleaner energy system that Britain needs.

Since 2013 network companies have run over 20 different projects across Britain to understand how to manage and take advantage of the opportunities presented by the roll-out of electric vehicles.

Network companies must share the lessons learnt from these projects with other network operators as part of their licence conditions.

These projects are spread across 5 categories:

- EV acceptance and roll out schemes and trials
- Controlled charging and smart grids
- Standards, policy and protocols for EV charging
- EV charging infrastructure
- EV impact on network

Our members are already starting to see the benefits of vehicle-2-grid (V2G) services and the role that can play in terms of providing 'flexibility services' to networks.

However, the technology is at a low Technology Readiness Level. Electricity network operators are working to trial and progress this as quickly as possible.

Innovation projects to date have highlighted the importance of:

- Increased visibility and mandated notification of where charging points have and will be installed on the network.
- The type of charging points (for example slow or fast) the importance of access to smart meter data.
- The need for smart charging infrastructure.

Western Power Distribution's 'Electric Nation' project

Case study

Electric Nation is a leading initiative focusing on collaboration with EV charging partners. Working with 700 EV drivers, Western Power Distribution (WPD), Britain's largest electricity distribution network operator, is installing free smart chargers which will be managed by the network to mimic situations where an EV cluster has evolved and is causing network stress, while also collating customer research surveys.

Working with a wide range of makes and models of EV, the project will provide WPD with a more solid understanding of data and trends which allow them to analyse future development and demand on the electricity networks.

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What do Britain's energy networks need?

Dealing with EVs on a reactive basis will be inefficient and result in an increased cost to the customer in network reinforcement in order to maintain security of electricity supply.

A proactive approach to improve the efficiency of network investment is key. To do this, energy networks require:

- Clarity in policy, the way EVs are rolled-out and therefore the potential impact on networks.
- Increased access to data to improve planning.
- Clear routes to funding and cost recovery.

This will improve certainty for more cost-effective investment planning. The Government's decision to promote smart charging over unmanaged charge points and the speed of uptake of these is critical.

Without this, there could be a proliferation of "dumb" charging points taking capacity from the electricity networks with no opportunity to manage the associated load, leading to the need to build expensive new infrastructure that could otherwise be avoided.

What is the wider story?

A new model of running local electricity grids is needed, so local network operators become 'Distribution System Operators' (DSOs) that have options available to them beyond building new pylons, sub-stations and other infrastructure.

These changes will lay the foundations for Britain's smart grid, moving local electricity grids from being distributors of electricity to being a platform that new technologies and services can connect to.

This transition, combined with innovation projects, standards development and data-sharing will reduce the potential cost of building new infrastructure that would otherwise be required to manage the uptake EVs — through increased use of flexibility services, including V2G, to compete with that investment.

Other examples of flexibility services include:

- The sale of power to the grid that is generated by small-scale distributed generation resources such as solar panels and wind turbines.
- Businesses adjusting their electricity use at the times of day when they least need it.
- Using new smart energy efficiency technology to adjust consumption remotely and buying electricity from battery storage.

Network operators have already pledged to rapidly increase the use of these services during this price control period ending 2023.

All of Britain's Distribution Network Operators are now developing and delivering their own 'DSO transition' strategies to understand what changes they need to make and how they make them.

Working with BEIS, Ofgem and the wider energy industry, ENA's Open Networks Project is co-ordinating this activity at a national level.

Where can I find out more?

For more information please contact ENA's Press Office via press@energynetworks.org or on 07725 372 758.