INNOVATION NEWSLETTER

SUMMER 2019

WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

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New Projects

As part of the 2019 Network Innovation Competition process we have submitted two project proposals to Ofgem:

FreeVE

FreeVE will examine the value to consumers, networks and the whole energy system of the additional demand flexibility provided through the coordinated smart management of electric vehicle charge points, hybrid heating systems, photovoltaic panels and storage. Past projects have explored each of these Low Carbon Technology (LCTs) assets in isolation, but no trials have demonstrated their combined impact at a local level, including spatial considerations, or the benefit of cross-vector coordination. FreeVE will implement a large-scale trial of differing combinations of LCTs and control modes within private and publicly owned domestic dwellings, and small public buildings connected to the LV network – on a single connection and an aggregated basis. Through improved models of demand profiles, and better understanding of customer behaviour, FreeVE will increase LCT connection capacity, availability and utilisation, and reduce the need for network reinforcement. It will allow licensees to accurately plan and forecast mitigation, and minimise costs.

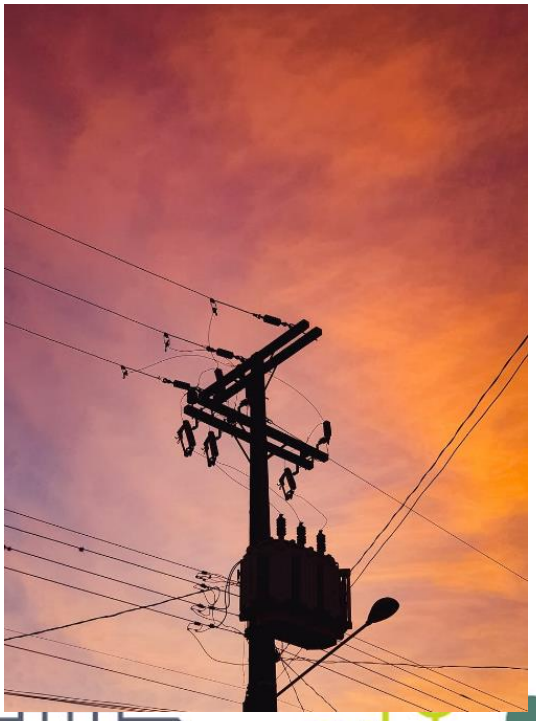
DC Share

The project aims to build a meshed DC network on the low voltage system to balance load profiles across substations and to enable the deployment of rapid car chargers which would have otherwise required heavy reinforcement on the AC network. The project is led by RICARDO, and partnered with Turbo Power Systems and Vectos, who will design the DC power electronics and deploy the DC network.

Project Updates

Next Generation Wireless Telecoms Analysis

The project has confirmed the feasibility of using a private network based on Long Term Evolution (LTE) or similar technologies operating in Ultra High Frequency (UHF) spectrum to provide upload-centric Smart Grid connectivity for single or multiple Distribution Network Operators (DNOs) areas. A design has been produced which provides adequate outstation coverage from base stations largely located on existing WPD telecom sites with other sites and backhaul being added or upgraded. The project will allow us to scale the necessary system and infrastructure deployment, inform the investment requirements for future Distribution System Operator (DSO) communications capability and assist business case formulation. The project will also characterise and quantify the radio spectrum requirements and provide evidence in support of discussions with government, regulator and industry representatives and stakeholders.



Smart Energy Isles

The Smart Energy Isles project system curtails multiple LV-connected generators depending on sub-sea cable utilisation. When curtailment is forecasted the system signals a Demand Side Response system to execute a trading cycle that procures demand to alleviate the curtailment. The project is now mid-trials and a project meeting is scheduled to review the findings.

Projects Continued…

Electric Nation

The project team is now focusing on three main areas before project close in October: writing the closedown report, Vehicle to Grid (V2G) and development of the Network Assessment Tool. The V2G trial is now running the full test profiles for charge and discharge, with the cars and units responding well to signals.

Network Equilibrium

Network Equilibrium, the Tier 2 LCNF project that implemented intelligent voltage and power flow control in 33kV and 11kV networks, finished in June. As part of this project, the team designed, implemented and successfully trialled System Voltage Optimisation (SVO). SVO is a centralised voltage control system in the South West area that optimises the network voltages in real-time by sending target voltage settings to BSP (Bulk Supply Point) and Primary Substations based on the actual network operating conditions, with the aim of releasing network capacity. Through the project's trials it was shown that there is headroom in the network to shift the voltage profiles up or down and optimising the voltages can therefore release significant amount of capacity. In Network Equilibrium, we have also installed the Flexible Power Link (FPL), a power electronics device at Exebridge Primary Substation. The FPL has allowed us to transfer power between Barnstaple and Taunton BSP, something that could not be done previously because the two BSPs belong to different grid groups and could not be interconnected. The FPL is the first implementation of such a device on the distribution network in the UK and has shown how power electronic converters can provide flexibility in the way the distribution network is managed. Both the FPL and SVO are remaining operational as part of Business As Usual processes.

Innovation Events

The Electric Nation Dissemination Event at the British Motor Museum was a huge success, with the event being fully booked. The feedback was great on the content, the venue and presentations.

The team is currently planning the next Balancing Act Conference, which will take place in November. More details will follow in our Autumn Newsletter and on the Events Page of the Western Power Distribution website.

The Innovation team is now making greater use of webinars and members of the team will be speaking at several events this year. For more details on these please visit the Innovation Events Page.