Future Networks Newsletter Spring 2018

WESTERN POWER DISTRIBUTION INNOVATION

New Projects

We recently raised a new Network Innovation Allowance (NIA) project, **Primary Networks Power Quality Analysis.** As the proliferation of Distributed Generation (DG) and Low Carbon Technologies (LCT) connections to the network continues, the potential impact on the power quality of the system could be dramatic. This impact is focussed on the power electronic devices connecting to the network, such as inverters, which often have a significant harmonic contribution to the wider system.

This project will investigate how the connection of many of these devices in a concentrated area could affect the power quality, through harmonic content, of the system. This will involve wide area power quality monitoring to understand how the network reacts to different devices connected to the network. This data will then be fed in to detailed harmonic models to understand how the network contribution of additional devices, following well understood projections of future DG and LCT integration, will impact the system. The learning generated from this project will then inform the potential need for solutions to manage and mitigate harmonic network issues going forwards.

Above: Example of Power Quality monitoring equipment installed inside a 33kV substation.

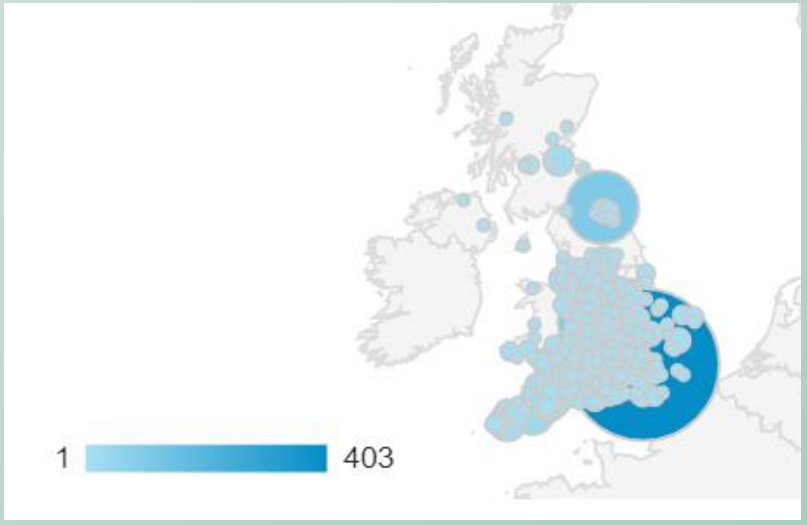
Customers

The App and website produced through our **Carbon Tracing** project went live on February 8th. Both the App and website are trailling what influence the visibility of carbon intensity can have on reducing customer demand. In that time we have seen around 1600 downloads. We have around 150 regular weekly users and are adding new ones at around 10 per day.

We have been using Google Analytics and Prolific Feedback to gain insights into how well the app has been received and what users like and don't like. We are adding this to our own view of the app, developed since operations commenced, to scope a small number of modifications to the system as part of a second project called Carbon Portal. This project is principally concerned with making the data driving the App available to interested third parties and will implement a set of service Application Programming Interfaces (APIs). We have just fielded a query from a small independent developer who already uses the National Grid transmission carbon intensity API service to control when his dishwasher turns on and off. The WPD Carbon Tracer API could make this much more locally relevant.

A report of our findings from the project will be issued at the end of June and will provide a view on the extent to which customers are prepared to engage on the basis of carbon intensity.

We will continue to market the App via occasional social media announcements and a number of interest groups are looking closely at it. As shown in the diagram to the right, the user locations on Google analytics shows a good pattern across the WPD DNO area (and beyond).



Search 'Carbon Tracer' to download the App. Or visit https://carbontracer.westernpower.co.uk.

Assets

Above: Recent installation completed in Derby. The white box mounted on the top of the LV cabinet is the OpenLV equipment. Bottom left of the cabinet is the grey LucyGridKey monitoring box.

The **OpenLV Project** will trial and demonstrate an open, flexible platform that could ultimately be deployed to every LV substation in Great Britain. Through three key Methods, the Project will demonstrate the platform's ability to provide benefits to the network, customers, commercial entities and research organisations.

Method 1: LV Network Capacity Uplift; The Network Capacity Uplift Method will demonstrate the capability of the OpenLV platform to perform measurements and control from within a HV/LV substation.
Method 2: Community Engagement; Once deployed, the OpenLV platform can be used to provide data to customers or groups of customers in communities. This Method will test how this could be promoted and achieved in practice.
Method 3: OpenLV Extensibility to 3rd parties; This Method will provide OpenLV as a secure platform to third parties for them to develop and release their own Apps offering new services to DNOs and customers alike.

The project is now well into the installation phase with over half of the 60 Method 1 installations completed. So far we have installed units in substations in Derby, Milton Keynes, Northampton and Cardiff areas. The final units will be installed by the end of May in Nottingham, Leicester and Lincoln. Data for the installed Method 1 sites is now being captured and the five pairs of substations that will be used for a LV Meshing trial are being selected.

Method 2 Community group participants have been selected, as have the Method 3 Commercial and academic groups. Work is now under way to survey and install the units for these sites.

We have been pleased with the diversity of App ideas from external sources both from the community groups and commercial/academic groups. EATL and CSE are currently discussing the best way forward in order to support the various groups with these ideas.
The next report on Identification of Target Networks (Method 1), Assessment of the Market Potential (Methods 2 & 3) and Detailed Trial Design for all Methods is due on 30th May. More information is available on the projects dedicated website https://openlv.net.

Operations

The Common Information Model (CIM) for electricity is an international standard developed to support exchange of electrical network information and could be used to support the information layer of the smart grid architecture model.
Our **CIM Project** is looking to extend the existing Integrated Network Model (INM) for 11kV to export data in CIM format.

The first release of the INM technical data of the WPD South West region in portable CIM format was made at the end of March following just over a year of development. The INM assembles and rationalises data from existing asset management and planning platforms and builds a high level view of the network. This development grew out of the earlier innovation work done on the FALCON project in support of the network modelling tool, but this earlier work covered a more limited area around Milton Keynes.

With the technical data now available for the South West region we will make this available to a number of third parties, and we have approached around twenty over the last few months to announce this innovation and establish interested contacts. The organisations who have responded with an interest include universities, DNOs, National Grid, solution vendors and aggregators.
Before making the technical data more widely available the project has engaged the services of one of the solution providers with previous extensive CIM experience. This vendor is currently importing the data and will assess it and use it to drive their visualisation tool as a proof of use exercise. This step will ensure that the CIM model of our SW network that we issue to the first data consumers has been independently validated.

From that point, we load the data onto a dissemination server and we are asking the data consumers in our trial to register and exercise this part of the process as well. All users need to agree to our robust data privacy standards to ensure all data is securely stored. From there they will be able to load the technical data and make use of it in whatever way they choose and then report back on how this went. Register for our website updates here, to be notified of the wider technical data release.

Find out more

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