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Working with a DNO on planning for energy

Paul Jewell
DSO Development Manager

18th July 2019

Agenda

- Distribution System Operator (DSO)
- Flexibility Solutions
- Electric Vehicle Strategy
- Open LV Innovation project

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Drivers of change

- Climate change and international agreements on reducing carbon emissions
- EU and UK binding targets – delivered through renewable Distributed Generation (DG), Electric Vehicle and Renewable Heat Incentive
- Rapid changes in GB generation - Much greater levels of Distributed Generation and community energy
- Rapid changes in technology and consideration of whole system issues
- Often summarised as the 4 ‘D’s – Decarbonisation, Decentralisation, Digitisation and Democratisation

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DSO Vision

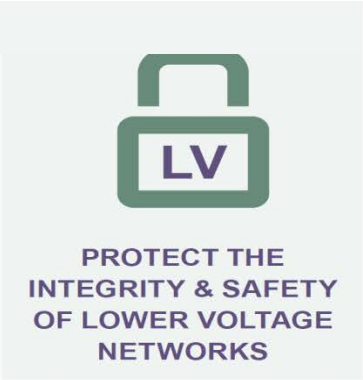
- Facilitate the transition to a low carbon economy
- Enhance system security
- Keeping network costs down and facilitating access to national markets
- Facilitate quicker and lower cost connections
- Trusted by all parties as a neutral market facilitator

- Our focus areas are:
  - Using third party flexibility where economic compared to asset solutions
  - Whole electricity system solutions and interactions
  - Open data wherever possible

DSO Strategy

We have published our DSO Strategy

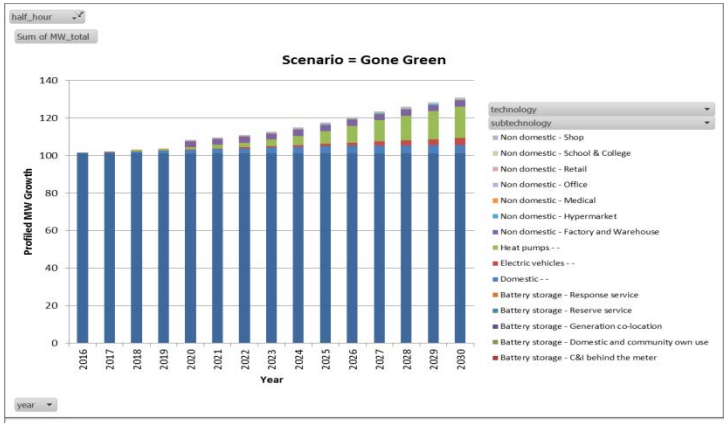
- It outlined our four key focus areas for DSO implementation and our plan to achieve them
- We highlighted key enablers in monitoring, control & automation, communications and data systems to enable us to be a high performing DSO



- We consulted on this approach and updated our plan based on feedback
- **We are the only DNO to have provided a costed DSO implementation plan**

www.westernpower.co.uk/our-network/strategic-network-investment/dso-strategy

Scenario Based Forecasting



Since 2016, WPD has been using scenario based forecasting to build a regional picture of demand, generation and storage uptake

We have built a bottom-up understanding of demand, generation and storage growth out to 2032 across 260 individual zones within our region and share this information.

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2019 – A Year For Flexibility

In 2019 we are seeking flexibility across 80 primary substations, requiring up to 93.4MW. This may defer up to £25m of load related reinforcement

Flexible Power
By Western Power Distribution

Signposting

Early February 2019

Pre Qualification Questions

February 2019

Procure

March to May 2019

Integrate/Test

May 2019

Operate

June 2019 to May 2021

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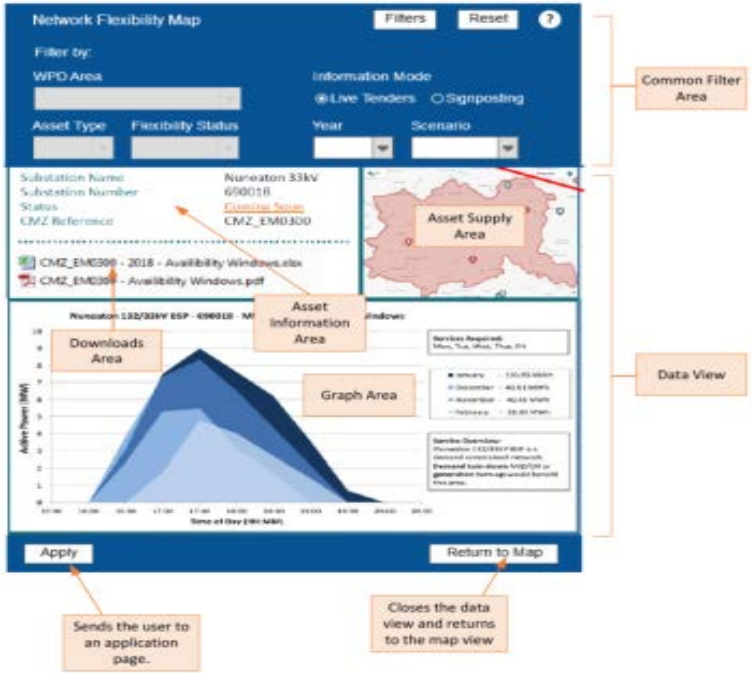
Signposting

To inform flexibility markets of our requirements both now and into the future, we have committed to publishing "signposting" information which describes the constraints triggering any significant load related reinforcement

- This year, we have published signposting on £60m of load related reinforcement.



Using a similar functionality to our network capacity map, our network flexibility map is publically available on our website:

www.westernpower.co.uk/signposting

This displays information on:

- Geographic supply area
- MW peak and length for availability
- Estimated MWh utilisation
- Months/days/hours applicable
- Raw data downloads
- Four Industry-aligned future energy scenarios
- 5 year window

Electric Vehicles and the changing horizon

- Our forecasts for Electric Vehicle adoption predict around 37,000 across our region now rising to 3,064,000 in 2030.
- In simple terms, each Electric Vehicle uses the same kWhs of energy per year as a standard domestic home.
- The What Car “Car of the Year” for 2019 being the Kia e-Niro and it being described as “sensibly priced” and will “fit into most people’s lives”.
- We also predict price parity in 2021 or 2022 and a step change in car ownership.

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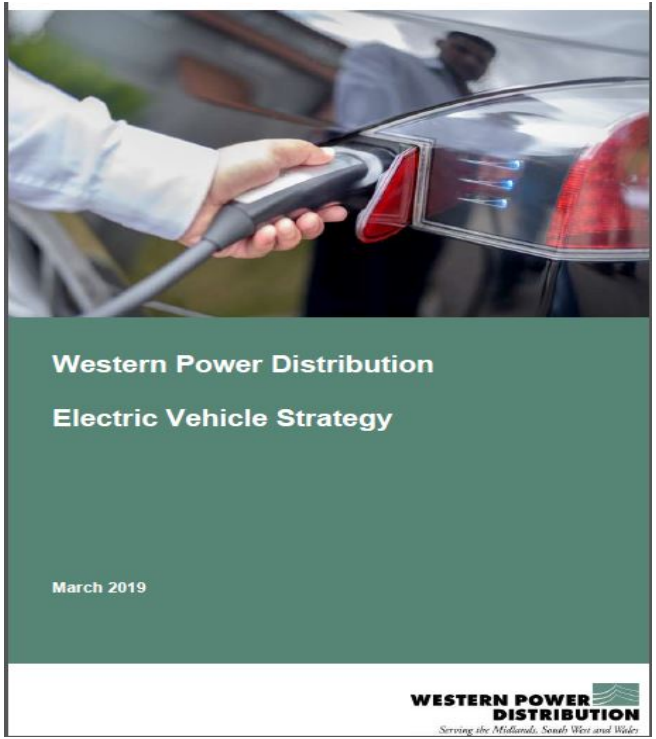
Electric Vehicle Strategy Document

- Our first Electric Vehicle strategy document was issued in March 2019. It covers areas including;
  - Our forecasts and assumptions
  - Technical considerations
  - Stakeholder Engagement
  - Our plans to support connections
  - Innovation Projects
  - Transitioning to Business as Usual



- hhtps://www.westernpower.co.uk/electric-vehicles

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Making use of existing capacity

- We predict that many of our local transformers would support one 35kWh charge every five days for each connected customer
- 35kWh equates to around 150 miles range in many EVs
- The DoT National Transport Survey 2017 sets average annual mileage for all cars at 7,800 miles (and dropping)
- We will continue to identify heavily loaded assets and hotspots, and uprate them through the normal reinforcement process.

Engagement with Local Authorities

- During 2018 we saw an increase in interest from Local Authorities who were planning to support Electric Vehicle deployment. Government grants have become available to help them with infrastructure.

- We held two Local Authority stakeholder Electric Vehicle events (Bristol & Birmingham) in November with 130 participants.

- Since the Electric Vehicle event we have revised our guidance to LAs based on their feedback and comments.
- https://www.westernpower.co.uk/downloads/15766

- We are planning innovation projects which will help LAs deliver charge points in an efficient way

Engagement with Government

- We are working with OLEV and have engaged with them following the EU changes to the Building Performance Regulations. We want to ensure that changes to the regulations accommodate all future LCTs

- Our “Superfast Electricity” projects have been developed with Welsh Government support

- We engage on the Electric Vehicle Energy Taskforce with Innovate UK and Catapult Energy Systems

- We are working with BIES and BSO on Smart Device Standards

Accommodating EV demands

- At a domestic level we will use Electric Nation results and plan to install three phase services as a minimum standard
- On our low voltage network we expect to connect streetside chargers and also offer single high capacity charger connections at fuel stations.
- Using bespoke transformers we will connect Hub charging for cark parks, and also connect multiple high capacity chargers. We will also connect some depot charging installations
- Using HV connections we will connect larger charger installations and high capacity depot chargers, such as bus depots

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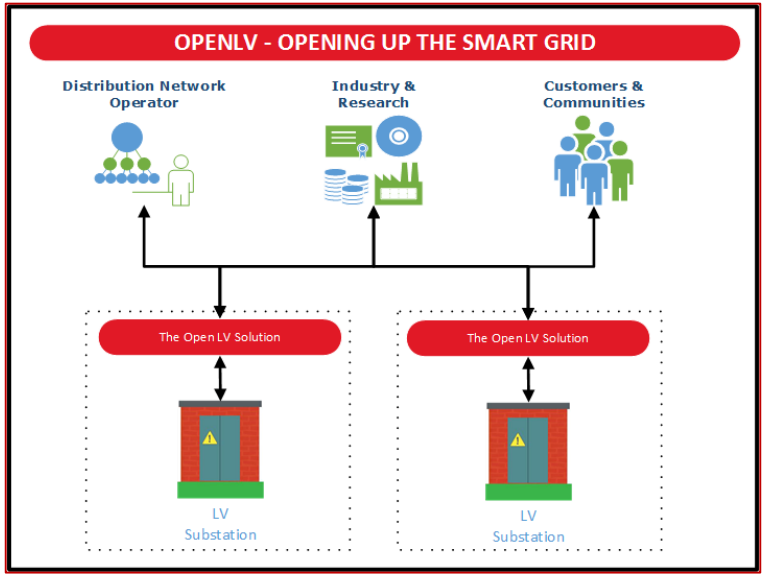
Open LV Project

Duration: January 2017 to April 2020
Budget: £5,908,000

Apps have revolutionised the way in which we use various electronic devices, enabling third-party development to suit specific consumer needs. The electricity industry can utilise this approach.

The project aims to provide a common, low-cost platform that can facilitate the deployment of different apps to suit the needs of the network, its customers, and the broader supply chain.



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Open LV – Project Description

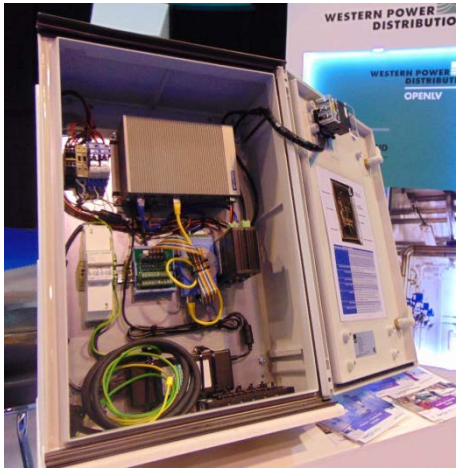
OpenLV aims to trial and demonstrate an open, flexible platform that could ultimately be deployed in every low voltage (LV) substation.

The OpenLV solution includes the following key components:

Intelligent substation devices that can support software Applications or ‘Apps’ from multiple vendors on a single device. Providing a low cost hub that, once deployed, can act as a hub for many more functions;

A secure platform that enables the intelligent substation devices to be remotely managed; and

A secure platform that provides LV network data to community groups and third party organisations. This will facilitate non-traditional business models by opening up network data to third parties to understand the network and deploy solutions.



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Open LV – Test methods

During the project, the platform called LV-CAP™ will be used for three methods:

1. **Network Capacity Uplift -** Increase the capacity of the LV network - prove how network control/ automated meshing can be carried out, effectively and securely, via a highly decentralised architecture.
2. **Community Engagement -** Test the value of providing LV network data and an open platform to communities, who want to be part of a smarter grid.
3. **OpenLV Extensibility -** Enable third-parties to develop Apps to improve network performance, and facilitate non-traditional business models and support the uptake LCTs.

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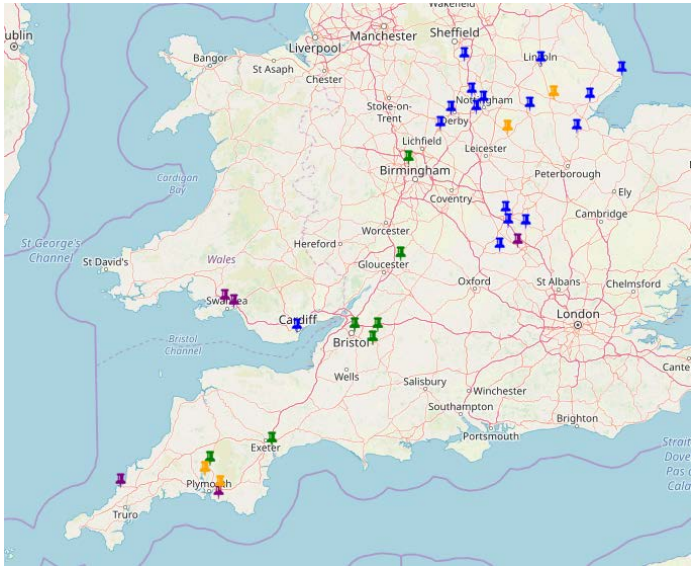
Open LV – Early outcomes

The project has now deployed 80 units across all four of WPD's license areas. All methods have been successful, with automated meshing taking place at two substation pairs, seven community groups using substation data for their needs, corporate apps being tested for deployment, and academic papers being written using project data.

The project is still mid-trials, but there is already substantial learning available in published reports, regarding project design, testing, third-party engagement, market assessment, and deployment.



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Thanks for listening