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WESTERN POWER DISTRIBUTION
Serving the Midlands, South West and Wales

The shift from Distribution Network Operator (DNO) to Distribution System Operator (DSO)

In line with the rapid change in the UK's electricity system, Western Power Distribution (WPD) is developing the future electricity network by moving from a DNO to a DSO. Businesses, communities and homes could have an active role in how the electricity network is operated by providing services to the DSO to manage the electricity network more efficiently.

The current electricity distribution network was designed and built to have electricity flowing one way, with electricity coming from large scale centralised power stations down the network to customers. The energy system is evolving to include more distributed sources of electricity generation. These include large commercial and community owned solar farms, wind farms and hydroelectric sites. Smaller scale electricity generation has also been installed on the sites of businesses and homes, for example rooftop solar panels.

This evolution has led to electricity flowing two ways, which the system was not designed for. This is presenting new engineering challenges. As part of their transition to DSOs, DNOs are responding to these challenges.

New smart technologies will allow DSOs to have more visibility of what is happening on the network in real time, allowing the operation of the network to be optimised (see case study and Figure 1).

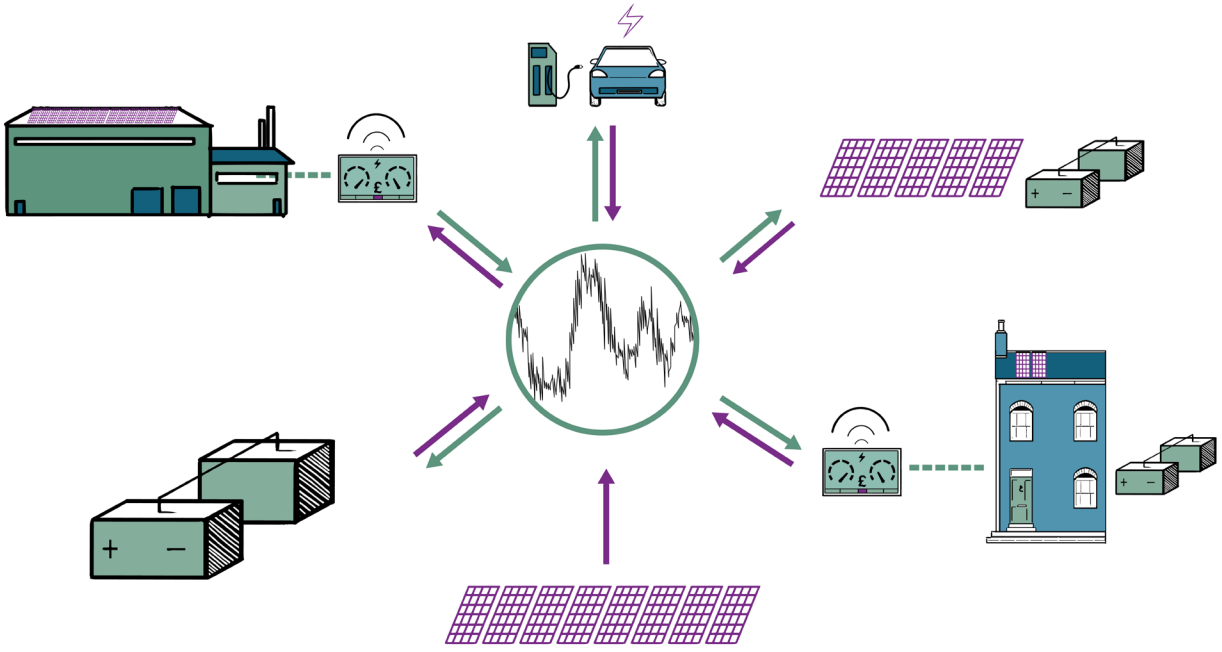

Figure 1: A DSO will use more real time data from smart technologies and services provided from different connected customers to help improve the management of the electricity network.

Our investment of £125 million to transition to a DSO will support the customer adoption of electric cars, low carbon heating and for further distributed generation… we are investing £600 million in reinforcing the network…

Western Power Distribution, Distribution System Operator Strategy

The shift to DSOs will have a number of benefits to customers. Connections to the network are likely to be cheaper and quicker due to the optimised operation of the network. They will help avoid some of the costs of expensive network upgrades being passed on to customers, through their electricity bills. DSOs will be working more closely with other network operators to ensure that these benefits that arise are passed on to customers.

The changes to the energy system could provide new opportunities for businesses, communities and homes, where they can offer services to the DSO in return for financial benefits. These services could include being paid to use surplus energy when there is too much electricity generation or be rewarded for reducing their usage at certain times (see the role of local flexibility case study).

Energy storage could be used to help balance the electricity system. Customers with storage could benefit from additional revenue streams. For example, if a business that generates electricity from solar panels also installed a battery, it could store the solar energy and export this later when the system requires it.

The additional visibility of the real-time network operation, combined with increased flexibility will result in a more balanced energy system. This will avoid some of the costs associated with network upgrades and enable customers to connect to the network quicker and at a lower overall cost.

CASE STUDY

Open LV

The OpenLV Project is a Network Innovation Competition project, managed on behalf of Western Power Distribution by EA Technology. It is trialling a software platform (LV CapTM) that allows the data from the local electricity network to be captured and shared. The LV CapTM software has been designed to integrate with third-party products and will aid electricity network control at a local level.

The software platform is being installed at 80 Low Voltage (LV) substations in the WPD licence areas – South West, East and West Midlands and South Wales. The system measures and manages activity on each substation and can allow the substation to temporarily link with another substation to increase capacity or release capacity depending on the demand at the time.

The project is working with seven communities and 17 business and academic groups to develop apps that can integrate with the LV CapTM software platform to provide benefits to the network operator and customers. The ideas range from identifying new business models, deployment of local tariffs, to raising public awareness around energy usage.

Open LV hopes to identify new opportunities and financial benefits for all parties involved. The financial benefit of improving the capacity of the local network alone is expected to be £120 million. Find out more at openlv.net