

SMART STREET

Creating efficient distribution networks

electricity
north west

Bringing energy to your door



Distribution network operator Electricity North West has completed a pioneering project to make the North West's power network more efficient and save money for customers. Using intelligent software installed at the company's control centre, the Smart Street project trialled new techniques to stabilise voltage which saves money for customers by making their appliances perform more efficiently.

Electricity North West, the company who operates the electricity network in the North West of England, is leading the way in developing smart solutions to meet the UK's future energy challenges.

Smart Street is the first demonstration in Great Britain of a fully centralised low voltage network management and automation system. Its new techniques optimise voltage and configuration on high voltage (HV) and low voltage (LV) networks in real time using bespoke Spectrum Power 5 software developed by Siemens. These techniques stabilise voltage and minimise the impact of low carbon technologies.

Once voltage is stabilised, it can be lowered to increase the efficiency of electricity networks and customers' appliances and therefore deliver energy savings, a technique known as conservation voltage reduction (CVR).

Project trials

A range of new voltage management technologies were installed in the company's main control room, at six primary substations and at 38 associated distribution substations. The trial sites served around 67,000 customers in Manchester, Wigan, Wigton and Egremont. These sites were chosen as they were representative of the company's geographic area and different customer types.

The trials began in January 2016 and ran over a two-year period so that one year's worth of Smart Street data could be compared with normal network operation. This enabled the project team to calculate the overall benefits of Smart Street and understand any impact on customers.

Findings

The deployment of the different technologies, integrated into a unified system controlled by Spectrum Power 5 demonstrated that it is possible to safely use autonomous software to optimise the running of interconnected LV networks throughout the day.

Analysis of the data generated by the project has shown that implementing these techniques can provide a reduction of up to 10% in energy consumption on the LV network coupled with a reduction in HV losses of up to 15%.

A series of detailed academic reports generated by the project assess the benefits of the Smart Street techniques including:

- The potential benefits of CVR on the trial networks
- The benefits of time limited ring operation on the LV networks
- The impact of lowering voltage on power quality
- Studies on the carbon impact
- Cost benefit analysis of Smart Street compared to traditional reinforcement methods.

Customer engagement

A key hypothesis of Smart Street was that customers would not perceive any change in their electricity

supply as a consequence of the trials. Before the technology installation began, the company launched a campaign to inform customers in the trial areas about the project. A customer focus group was held to help decide the best way to communicate information to the 67,000 customers served by the trial circuits.

The project team worked closely with contact centre colleagues to ensure that any power quality issues that could potentially be linked to the trials were captured; none were reported. The final phase of research involved a series of targeted focus groups to collect qualitative information, to understand whether customers observed any changes in their electricity supply as a result of the trials. These were held in January 2017 and January 2018 and demonstrated that customers on the trial circuits did not notice any changes in power quality during the trials.

The project closedown report and final academic reports will be published in April 2018 on the project website at www.enwl.co.uk/smartstreet.



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