



Customer-Led Network Revolution

news

Issue No 1 March 2012

Welcome to the first newsletter from the Customer-Led Network Revolution project! For an update on events since the project began, please read on....

- 1 CLNR website enables customers and industry alike to join the revolution**
The website explains smart grids and provides a gateway for more detailed information.
- 2 Network monitoring equipment installed to study impact of photovoltaic (PV) cluster**
Equipment installed in Maltby, to monitor the impact of the planned installation of dozens of PV solar panels on the roofs of houses of local residents.
- 3 Network technology and community engagement to be focussed in the same key locations**
The project is seeking to maximise learning by bringing together technology trials and customer participation.
- 4 The revolution shares knowledge with CIRED in Lisbon!**
Two CLNR papers have been submitted to this influential technical conference.
- 5 Customer engagement plan available**
How CLNR trial customers will be fully supported.
- 6 Control systems to enable a more dynamic network**
Intelligently matching supply and demand to lessen the need for upgrades.
- 7 From concept to delivery – sharing learning with the IET community**
There have been two regional engagements with IET audiences enabling a broader discussion of the project with the professional engineering community.
- 8 Major contract awarded for energy storage**
Northern Powergrid has awarded a substantial contract to US energy storage company A123 Systems Inc.
- 9 Initial phase of industrial and commercial customer trials concluded**
The trials with different customer types proved the feasibility of procuring services and the results are informing the winter 2012/13 trials.

For further information on any of these articles or to suggest an item for inclusion in a future newsletter please contact media@networkrevolution.co.uk

1 CLNR website enables customers and industry alike to join the revolution

The project's website, www.networkrevolution.co.uk, aims to reach out to the public, communicating complex, technical issues in a straightforward way and to encourage and support participation in the trials. But while the site as a whole is designed to appeal to customers, the specific 'Industry Zone' section covers the technical issues in more depth. This means that visitors to the site can choose for themselves what level of detail they want to read on a subject.

Dr Liz Sidebotham from Northern Powergrid said *"The site provides a professional and engaging platform for showcasing this innovation project, and we will continue to enrich the functionality and content as participants join the trials and the results start to come through."*



2 Network monitoring equipment installed to study impact of photovoltaic (PV) cluster

The project achieved an early milestone last year with the installation of equipment at the local substation in Maltby, South Yorkshire, to monitor the impact of the planned installation of dozens of solar PV panels on the roofs of houses of local residents. Where there is high penetration of PV cells, in this case 25% of the connected premises, the network needs to be carefully monitored and managed to avoid any adverse effects on network performance, such as an unacceptable rise in voltage.

Achieving the installation of the equipment before the PV installations enables the project to monitor the impact the electricity network before any PV is installed and to track the impact on the network of the installed PV as the penetration increases. The Nortech Envoy substation monitoring system measures voltage, current, power flow, disaggregated substation distributor loads, power factor and harmonic distortions.



Commissioned Nortech Envoy substation monitoring device. For more photos of the installation visit the project website.

3

Network technology and community engagement to be focussed in the same key locations



Wooler, Northumberland. One of the key locations for the project.

The Customer-Led Network Revolution project is studying network technology and customer behaviour, and in the later stages of the project will look at how network technology, customer technologies and commercial factors can work together to achieve a secure, balanced, efficient and cost effective electricity network – the smart grid. Although the project will involve around 14,000 customers across a wide geographic area, it is also important to carry out more sophisticated and detailed studies in key locations. Two of those locations are Wooler in north Northumberland, and Darlington in County Durham. Together, these locations enable the project to study a wide range of factors as they provide diversity in terms of energy consumption, the type of network, and the type of community being served (rural or urban). As such, they are a good representation of energy networks generally.

The project has developed materials to engage customers and to support their recruitment and participation in the many trials being undertaken within the project. This customer engagement activity commenced in quarter one 2012. In addition to this, the project will be

actively engaging with local communities at the key trial locations to explain in more detail the nature of the trials, to obtain feedback and to support the customer recruitment activities – achieving a good number of trial participants at these key locations will benefit the success of the later and more complex stages of the project.

At these two locations, we will deploy advanced controls and technologies to monitor and relay information, new transformers with enhanced automatic voltage control, electrical energy storage systems and real time thermal rating devices. With these technologies Northern Powergrid, the electricity network operator, will understand how to create the 'headroom' on the network which will allow an increase in the number of low carbon technologies (such as PV, heat pumps, electric cars) to be connected while minimising the need for expensive reinforcement of the network.

The first stage in this deployment of network technology at the key trial locations was the installation of monitoring equipment at Wooler, a low voltage network in a rural location with a small but diverse

mix of customers. Kelvatek Bidoyng monitoring smart fuses were mounted on low voltage distributors between the two Wooler substations, and provide detailed data on voltage and power supply quality. These electrically interconnectable sites form part of the arrangements for monitoring network conditions at the remote end of an extended distributed system. Enhanced automatic voltage control and storage devices will be added later as part of the studies of network flexibility and how to create network headroom.



Installation of Kelvatek Bidoyng smart fuses and data gateway hubs. For more photos of the installation visit the project website.

4 The revolution shares knowledge with CIRED in Lisbon!

The Customer-Led Network Revolution project has submitted two papers for the [CIRED workshop](#) in Lisbon in May 2012. This provides a good opportunity to interact and share knowledge with the international electricity distribution network community on the aims and early learning emerging from the project. Co-authored by project staff from EA Technology, the Durham Energy Institute and Northern Powergrid, the aim of the papers is to present some of the early work on the network technology aspects of the project. The papers submitted for consideration are:

- **Demonstrating enhanced automatic voltage control for today's low carbon network;**

and

- **Customer-Led Network Revolution – Integrating renewable energy into LV networks using energy storage.**

Visit the [project library](#) for the full abstracts. The papers will be available after the workshop.



5 Customer engagement plan available

The project will be studying data from 14,000 customers in the UK, approximately half of whom will be in Northern Powergrid's licensed electricity distribution area of the north-east of England and Yorkshire. All types of customer are relevant: residential customers, small and medium sized businesses, and larger industrial and commercial customers. This includes customers who have their own electricity generation, whether this be a single household with PV on the roof, or a business customer with a larger generating unit. The project will also be studying customers who have the ability to reduce their demand at particular times or who have relatively large peak demands, such as those customers with heat pumps or who recharge electric vehicles. The vast majority of the customers participating in the

project will be electricity customers of British Gas, one of the project partners.

Although the project will be trialling some innovative arrangements with customers, it is important that these customers enjoy the same level of service from their electricity supplier and network operator as all other customers. This is addressed through the customer engagement plan which sets out all aspects of how the project will engage with customers, including customer recruitment and support, access to premises and interruptions to the supply of electricity. This document has been approved by Ofgem and is available in the [project library](#).

6 Control systems to enable a more dynamic network

Northern Powergrid's head of Network Operations Rod Gardner reflects on the part that control systems will play in the smart grid, making the network more dynamic and intelligently matching supply and demand in real time, without increasing the size of the assets. *"A self-healing grid is definitely feasible; it's not a pipe dream,"* says Rod. Read more in the article in global power industry online publication [power-technology.com](#).



7 From concept to delivery – sharing learning with the IET community

Work on the project has been discussed with two separate regional forums of the Institution of Engineering and Technology (IET).

Daniel Hollingworth of EA Technology gave a presentation to the IET local branch meeting in Chester in December 2011, focussing on the 'network flexibility' elements of the project. The session covered the technologies and their planned implementation, along with some of the key challenges, plans for integration of the technologies into a control system, and a review of the learning achieved to date. For a link to

the video and slides for this session, please visit the [events calendar](#) page of the Customer-Led Network Revolution website.

Further representatives from Northern Powergrid and Durham University presented to the IET Yorkshire and Humber Prestige Lecture in March 2012. Again, with an engineering-based audience, the focus was more on the technical aspects of the project. However, there was also broad interest in the consumer behaviour and economics underpinning the learning. Again, the slides are stored in the [events calendar](#) page of the website.

8 Major contract awarded for energy storage

Northern Powergrid has awarded a substantial contract to US energy storage company A123 Systems Inc.

A123 Systems Inc. will supply, deliver and install the Electrical Energy Storage (EES) devices which are planned for deployment on the network in November 2012. The deal represents an exciting, innovative solution whereby safe, clean, compact and highly efficient battery cell and conversion systems will sit at various locations on the Northern Powergrid electricity distribution network.

The storage devices will be used primarily to offset peak loads which will provide more flexibility to customers in the way they use and generate electricity. The results from the storage trials will help network operators such as Northern Powergrid ensure the electricity networks can handle and adapt to the mass introduction of low-carbon technologies.

9 Initial phase of industrial and commercial customer trials concluded

Northern Powergrid has now concluded the trials for winter 2011/12 with industrial and commercial customers providing demand reduction or additional generation at peak network loading. These demand response services were provided through two contracts signed with two commercial aggregators, KiWi Power and ESP Response, to help to manage peak demand on the local distribution network. Customers of the aggregators were paid to reduce their electricity usage or increase their generation in response to a signal from the Northern Powergrid control room. This allows the customers to generate an additional revenue stream for their own business whilst providing increased capacity and resilience to an ever evolving and changing electricity network.

The first phase of trials concluded at the end of February 2012. The customers who contracted with the aggregators comprised a refrigeration load, a combined heat and power generator and a diesel generator. The learning resulting is associated with forms of contract, competing with others to access the demand response resource and the reliability of the service provided. This is now informing the design of our second phase of winter 2012/13 trials.



Customer-Led Network Revolution

For more information about the project,
see our website

www.networkrevolution.co.uk

For all enquiries about the project, contact
info@networkrevolution.co.uk

For media enquiries call **01244 320 677**
or email media@networkrevolution.co.uk

Connect with us

