electricity north west

Bringing energy to your door

TOPIC 1: Our Demand Response Journey

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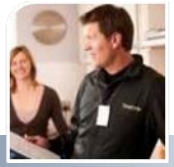
24 October 2012


Agenda

- Demand Response Trials
- Research work by Pöyry
- LCN Funded Capacity to Customers (C_2C) Project
  - Demand response
  - Customers' willingness
- Potential LCN Funded Customer Load Active System Services (CLASS) Project

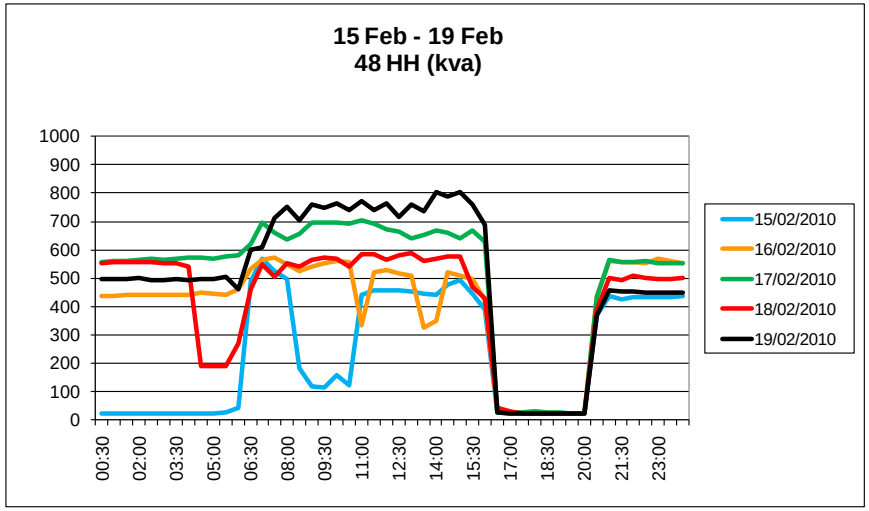
Demand Response

- Electricity users can strike demand response contracts with a range of electricity industry participants including DNOs
- Electricity North West is actively engaged in evaluating demand response as an alternative to network reinforcement
- We believe that demand response is key to the achievement of Government targets for creating a low carbon economy
- Flexibility in electricity demand has a clear value
- We have developed and trialled a range of options

ENW led Demand Response

- Two contracts signed directly with customers

- 2009/2010 Trial for winter reinforcement
  - Single customer
  - Very compliant to contractual signals
  - Continues to operate in this manner due to red, amber and green signals in new distribution charges



- 2010/11 Trial for summer reinforcement
  - Customer with own generation provided response by increasing generation - very successful, demonstrating greater responsiveness than anticipated

- Learnt that price point was too low for most customers

Aggregator led Demand Response

- Contracted with ENERNOC Get More From Energy an international leader in energy management
- Electricity North West will request reduction in demand at certain times via EnerNOC's state-of-the-art control room who schedule load for firms while minimising disruption to their businesses
- Two trials in Stockport and Bury were planned to operate for five years - first trial of its kind in the country
  - Bury trial continues as there has been customer interest
  - Stockport trial abandoned due to no customer interest
- Early learning is price point is too low for intrusion frequency and duration

Poyry Report Findings

- Electricity North West and National Grid commissioned Poyry to explore the implications for network companies of the different values ascribed to demand response by different procurers of DSR (ie National Grid, Suppliers and DNOs)

- Energy related price signals in general outweigh those of local networks related to network capacity. This, on its own, would tend to drive investment in network assets

Poyry Report Findings (2)

- Network capacity signals are amplified when there is network depletion. However frequency and duration of depletion varies across the voltage levels of the network

Figure 2 – Scale of value of DSR to the users across the scenarios, thus reflecting the rate payable to provider (1 = highest value, 4 = lowest value)

Scenario	DNO	TSO	Supplier
Shaving peak demand to avoid network investment			
Case A	4	-	-
Case B	3	1	2
Boost peak demand to accommodate wind and optimise prices			
Case C	3	2	1
Case D	3	2	2
Modify demand to accommodate low wind period			
Case E	-	3	1
Modify demand to compensate for a generation trip			
Case F	-	1	2
Case G	-	1	2
Modify demand to compensate for a transmission constraint			
Case H	-	1	-
Modify demand to compensate for a distribution network fault			
Case I	1	-	-
Modify demand to cope with volatile demand net wind profile			
Case J	-	1	2

- Under network depletion conditions (faults or planned outages) it is possible that DNO price signals will be sufficient to drive customer or generator behaviour, although the market will need to be designed to allow this to operate

Demand Response in C_2C Project

Capacity to Customers is innovative, low risk, maximises utilisation of the installed network capacity and has the potential to deliver the requirements of the low carbon economy

New Commercial Contracts

- To retain customers' security of supply we will utilise innovative demand side response contracts
- These contracts will allow ENWL to control the consumption of customers on a circuit at the time of fault

- Demand response to be provided by new connections customers and/ or existing customers
  - New connections customers forego reinforcement costs for demand response capability
  - Existing customers receive ongoing demand response payments for demand response capability
- C_2C tests customers' willingness to enter into 'post-fault demand response' contracts across the range of high, medium and low fault rate HV circuits
- C_2C will provide useful customer behaviour data against the variables of price, frequency of call and payment mechanism

C_2C Customer Survey Key Results

Is there an appetite in the I&C market for C_2C?

Key Interest Metric	All customers %
Appeal	**52**
Recommend	**26**

- 52% of customers found C_2C concept appealing
- 26% of customers would recommend their organisation consider opting into a C_2C contract (once they had seen the potential scope of the contracts in more detail)

C_2C Customer Survey Key Results (2)

What contract elements make C_2C attractive?

- The size of reward was important:
  - Customers responded positively to increased payments for accepting longer duration

- But specific contract components were critical:
  - Biggest influence on take up rate was contract length
  - Customers responded negatively to increased payments for accepting increased interruptions
  - Method of payment (‘Pay-per-usage’) and safeguarded days increased take up rate

Demand Response in CLASS Project

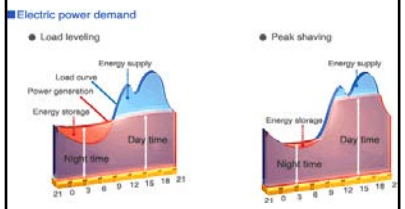
CLASS uses the known relationship between voltage and load to generate a demand response by applying a very small voltage reduction to generate a large demand response

Today

High Peak Demand

2% decrease in demand

At time of peak defers reinforcement allowing more Low Carbon Technologies to be connected at lower cost. Allows rapid connection of LCTs



Lower network costs
Faster connections

Tomorrow

Response & Reserve

2% decrease in demand

Compensates for loss of a large power station. Allows more low carbon generation to be connected and reduces need for reserve.

Lower balancing costs
Reduced carbon

And into the future

Wind Following

2% increase in demand

Allows several large wind farms to stay on load maximising the free wind

Lower energy costs

Summary

- Flexible electricity demand can be used by DNOs
- Trials have shown price point, offered, was too low for most customers
- Pöyry work showed DNOs can't compete, except when network is depleted
- C_2C proposes low intrusion delayed restoration demand response – C_2C concept appeals to 52% of customers
- CLASS proposes demand response from voltage reduction for peak reduction and frequency reserve

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TOPIC 2: Demand Response within ER P2/6

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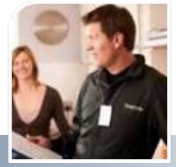
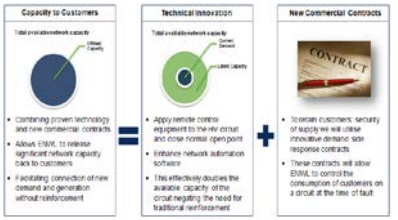



Background

- Capacity to Customers Project uses post fault demand response to release inherent capacity



- Electricity North West has sought a derogation to load up the specific HV networks above ER P2/6
- ER P2/6 doesn't allow Demand Side Response/ Demand Management to be taken into consideration
- A Successful Delivery Reward Criteria to "Develop a set of recommendations for potential changes to Engineering Recommendation P2/6"
- Smart Grid Forum identified updating ER P2/6

Capacity to Customers Project

- Engaged Parsons Brinkerhoff to manage development/ consultation process
- Work plan:
  - Internal workshop — *October 2012 - DONE*
  - External workshop — *January 2013*
  - Consultation — *February 2013*
  - Recommendations report — *March 2013*
- Some options considered in the ENWL workshop
- Early engagement with DNOs through bilateral meetings
- We are looking for your collaboration in next workshop and feedback in the consultation

Options being considered

- Amend Group Demand calculation:
  - Reduce max. demand of the group by the contracted value of DR

Pros	• Easily to implement
Cons	• Distorts group demand, as not observable

- Amend Capability of network to meet demand calculation:
  - Increase capacity of the group by the contracted value of DR

Pros	• Similar treatment to transfer capacity / DG • Easy to implement
Cons	• Increases complexity

- Other considerations:
  - Is there a need to define system normal?
  - Should contracted DR values be additive or discounted?

Next Steps

- Seek further meetings with DNOs to discuss options
  - Get involved - make your views know
- Review potential options at workshop in early 2013
  - Get involved - invites to be forwarded soon
- Consult on options in early 2013
  - Get involved – make your views know