CLNR – Propositions for industrial and commercial demand side response

20th June 2013

Andrew Spencer
What is demand side response (DSR)

• Demand Side Response: relates to any program which encourages shift of (demand) of energy by end consumers. The participation of the end customers is a response to factors such as incentive pricing, new tariff schemes, greater awareness and an increased sense of responsibility.

• The end consumers agree to involvement, but the participation may be active behavioural changes or passive through automated responses.

Source: ENA, Energy UK - Smart Demand Response - Discussion paper
Circumstances under which DSR will be triggered

Network Constraint / Post fault response

• Primary substation with occasional loading above firm capacity
• Fault on one of the incoming EHV circuits or a transformer fault
• Fault coincides with a time of peak loading
• No customers off supply after the fault
• Temporary load reduction required to maintain supplies until capacity is restored.
• In the course of normal operations the demand response will not be required.

Customer Role

• Rapid load reduction / generation to “shave” peak demand.
• The reduction in demand requested would be to scale back to the load to within the capability of the remaining assets.

Customer benefits

• Asset life extension by deferring network reinforcement.
Parties involved in I&C customer engagement

Winter 2012 Trials
- Working relationships with aggregators as the customer facing entity
- Focus of the trial was to test the commercial arrangements and the effectiveness of the demand response (speed, size, duration)

2012 Survey work
- We undertook two surveys to test I&C’s knowledge and appetite for DSR

Winter 2013 Trials
- Continue to work with three aggregators
- Also engaging directly with some I&C customers
Approaches to I&C customer recruitment

Options available to engage with the DSR market

• I&C customers directly
• Aggregators
• Suppliers
• National Grid (the Transmission System Operator)

Why partner with commercial aggregators

• Sales teams with industry experience
• Existing portfolios and customer prospects
• Proven capability to deliver front-to-end processes e.g. site evaluations, installation of smart meters, IT/comms with site and control room, maintenance programs (on-site generation), personnel training and ongoing support
• Valuable industry knowledge
DNO/Aggregator/I&C customer operating model

DNO

Aggregator

I&C Customer

Contract

DSR Call

Payments

Physical Response
Key features of the commercial arrangements

- **Season:** Nov – Feb 2011/12

- **Availability Window:** Mon – Fri 1500 - 1900

- **Indicative No of Calls:** 10 consecutive weekdays called once every three years

- **Response required:** A reduction of the contracted value relative to the consumption in the previous half hour.

- **Response Time:** 15mins

- **Response Duration:** 4 hrs/day

- **Availability Price £/MWh:** STOR used as a benchmark

- **Utilisation Price £/MWh:** STOR used as a benchmark

- **Penalties:** A failure to respond would result in suspension from the trial
Customer 1: **Mining**
- Contracted DSR: 2 MWh
- DR Type: CHP Generation
- Availability: 3pm – 6pm, Weekdays
- Response Time: 15 minutes
- Season: January – February 2012
- Instruction issued via phone call from Northern Powergrid control room to Aggregator

Customer 2: **Refrigeration**
- Contracted DSR: 0.75 MWh
- DR Type: Load Reduction
- Availability: 3pm – 7pm, Weekdays
- Response Time: 20 minutes
- Season: January – February 2012
- Instruction issued via phone call from Northern Powergrid control room to Aggregator

Customer 3: **Web-Hosting**
- Contracted DSR: 0.8 MWh
- DR Type: Diesel Generation
- Availability: 3pm – 7pm, Weekdays
- Response Time: 20 minutes
- Season: February 2012
- Instruction issued via phone call from Northern Powergrid control room to Aggregator
Industrial & Commercial – Pre/ Post Event Metering

I&C DSR

KWh

Time

0 100 200 300 400 500

Customer-Led Network Revolution

NORTHERN POWERGRID
delivering power all day, every day
I & C Winter 2011/12 DSR Trials – Contract Performance

Instruction Log
• 4 - 1 day events called across 3 sites
• 1 – 4 day event called across 2 sites

Successful events
• 9 successful DSR events from 13 instructions

Failure events
• Fire on site which removed one site for the winter 11/12 trial period
• Generator failure on 1 day, site resumed full availability the following day
• Event failure vs contractual parameters as DSR already provided for Triad (although load reduction achieved from the DNO perspective)
• Demand reduction delivered but not at the contractual level
Lessons learned – Winter 2012 I & C trials

• DNOs can build effective relationships with both the aggregators and direct with I&C customers for the purpose of providing DSR products

• DNOs are effectively in a competitive market for DSR primarily with the National Grid STOR products. However, the two requirements are potentially complementary

• The time required to finalise the legal framework for DSR products is material and the process can take up to 4 months.

• The definition and measurement of the response needs further consideration. The 2012 trials took the consumption just before the DSR request to be the baseline. The 2013 trials are trying different baselines.

• The DSR contracts delivered a 77% success rate when participants were instructed to deliver DSR. The scale of the trial at this stage is insufficient for a degree of confidence to be determined to inform industry standards for wider deployment.
Lessons learned – Winter 2012 I & C trials

• Locating customers that are willing to offer DSR for four hours in a day over a maximum 14-day period (potentially more than 14 days in some circumstances) will reduce the number of customers that can participate in these schemes. A solution to this issue is to use a portfolio of customers to deliver the DNO’s requirements;

• The approach to non-performance requires further consideration;

• The pricing structure was based upon STOR but needs further consideration;

• We need to determine how best to fund / incentivise the upfront work of locating and securing DSR participants.

• Knowledge transfer from the project to operational teams will involve a significant resource commitment.
2012 I&C customer engagement research

Purpose
• Gain a more detailed understanding of potential I&C DSR when targeting specific geographical areas

Method
• Research carried out by Flexitricity and ESP
• Ten primary substations selected
• The I&C customers in the selected primary areas were approached to assess:
  • their knowledge of DSR,
  • establish their willingness and capability to participate in DSR; and
  • identify barriers to DSR programmes; using:
• Engagement via
  • Telephone conversations,
  • Questionnaires; and
  • Meetings.
I & C customer engagement - research results

- When targeting a tight geographic area the initial customer drop-out rates are high.
- When contact is made with the right person in the business there is a low level of awareness of what DSR is amongst customers.
- When the concept of DSR is explained to customers a large proportion of customers want to understand more about the practical opportunities.
- The prospect of customers investing time and resources to develop their DSR capability did not represent a barrier.
- Even if customers show a positive interest in the DSR concept there may be no scope to provide DSR, e.g. not a high enough demand at the site or load profiles that did not correlate with the load profile of the primary substation.
- The implementation of DSR from generation substitution is the most successful entry point for new I&C customers wishing to participate in DSR schemes.
- The lead times from making initial contact with a customer to finalising a DSR contract can range from 12 to 24 months.
I & C Winter 2013/14 DSR Trials - Plan

Geographical Customer Recruitment
- Reviewed substations operating or forecast to operate at >100% of firm capacity;
- Aggregators tasked with engaging customers with DSR potential in these areas;

Engagement
- Using aggregators
- Direct contact by DNO

Contractual changes
- Measurement of response:
  - Floor methodology
  - Average consumption over the previous 10 days

GUS Interface
- Incorporate the I&C DSR contracts into GUS control system
- Work with the aggregators to interface with GUS
What is GUS?

- Active control system for dynamic distribution networks
- Integrated control of enhanced network devices
  - Demand side response
  - Real time thermal rating
  - Enhanced automatic voltage control
  - Electrical energy storage
  - Network monitoring
UK Power Networks
ENA Smart Grid Forum: Workstream 6
Industrial & Commercial Customer Engagement
UK Power Networks – Demand Response Trials

Industrial & Commercial Customers
UK Power Networks – I&C DSR Trials

I&C DSR – Project Description

- Low Carbon London set out to test the requirements, performance, and scale of opportunity of Industrial & Commercial demand side response...

- In order to understand the potential for DSR to support:
  - Distribution network constraint management
  - Capital programme efficiency (reinforcement deferral)

<table>
<thead>
<tr>
<th>Contracted DSR (MW)</th>
<th>Trial Phases (~3 months each)</th>
<th>Interventions</th>
<th>Main business utilisations</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 MW</td>
<td>Winter 2011/12</td>
<td>circa 5 events per site per phase</td>
<td>LCL DSR utilised as a mitigation on a Primary system P2/6 derogation</td>
</tr>
<tr>
<td>11.8 MW</td>
<td>Summer 2012</td>
<td></td>
<td>LCL DSR enrolled ‘early’ and held available during a network unplanned outage</td>
</tr>
<tr>
<td>2 MW</td>
<td>Winter 2012/13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.35 MW</td>
<td>Summer 2013</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What were the key features of the commercial arrangements, including the size of the price signal and number of events?

- **Key DSR contract terms – developed from STOR framework:**
  - Bilateral – DNO:Aggregator
  - Key payment terms are:
    - Availability payments [£/MW/h]
    - Utilisation payments [£/MWh]
  - Providers must be available throughout the ‘availability window’ and
  - Able to respond to requests within 30 minutes

- **General DSR framework:**
  - General contract terms set out in main body
  - Annexes now contain most all ‘quantifications’ of service, e.g. contracted MW, response time, availability window, etc.
What were the key features of the commercial arrangements, including the size of the price signal and number of events?

- **Pricing**
  - Priced to compete with the annual value of a STOR contract
  - Note the distortion this places on the availability/ utilisation rates

- **Key factors on overall contract value**
  - Availability payment (total) grows rapidly with long windows, i.e.
    - Hours in the day
    - Days of the year
    - Contracted MW
  - Number of events smaller percentage of contract value – though is a notable concern with most customers
What were the key features of the commercial arrangements, including the size of the price signal and number of events?

- **Event selection:**
  - Pre-fault selected on LCL primarily for trial purposes (guarantee events)
  - Fast response (< 3 min) contracts also being tested for post-fault uses

- **Network Load Curve Analysis** – Examine historic load profile data for:
  - Time of day and year
  - Availability window (hours of the day & days of year)

- **Dispatch:**
  - Procedure and key responsibilities set out in contract
  - Manual dispatch (phone call) from DNO to Aggregator control centre
  - Follow-on trial established for auto-dispatch
UK Power Networks – I&C DSR Trials

I&C DSR – ANM Enabling DSR

- **Use of the active network management system** to identify constraints and dispatch DSR in real-time

- **Key step towards direct DG control** - based on existing market structure (TSO DSR market)
What were your approaches to recruitment? What parties are involved in the recruitment, on-going engagement and operation of the arrangements?

- **Demand aggregators**
  - Used initially with standing framework terms for DSR services
  - Competitive environment within partner group

- **Additional aggregators later offered opportunity to participate as suppliers of DSR**

- **Procurement process:**
  - Each trial phase carried specific terms for DSR services
  - Services proposed by aggregators through submitting contract annexes
  - Multiple trial phases conducted
I&C DSR – Trial Description

What were your approaches to recruitment? What parties are involved in the recruitment, on-going engagement and operation of the arrangements?

- **Recruitment requirements and participation factors**
  - Minimum of 300kW site or group demand required
  - Maximum of 4MW contracted demand response per constrained substation – later introduced a 2MW limit on one site
  - Weighted payment rates towards demand type, i.e. CHP & ‘building turn down’
  - Sites connected at a specified network location

- **Moving forward** – are these requirements fit for on-going (ED1) use?
I&C DSR – Trial Description

What were your approaches to recruitment? What parties are involved in the recruitment, on-going engagement and operation of the arrangements?

- **Acceptance process:**
  - Base lining demand profiles (High 5 in 10)
  - Successful performance assessed against baseline profile:
    - 90% of requested MWs delivered at 30 minutes
    - Operation maintained to above 95% average

- **Settlement process:**
  - End of period reconciliation completed
  - Agreed process for declaring availability & un-availability
I&C DSR – Trial Description

How do you manage the uncertainty over activation of the DSR?

- **Contractual terms:**
  - No penalising terms placed in the contract other than reducing availability (and utilisation) payments in response to non-compliance
  - Value is heavily weighted towards availability

- **Set a maximum value for MW/site accepted**

- **LCL set out to test that uncertainty, specifically.**
  - Are contract penalties required?
  - Redundancy in number of sites?
  - Redundancy in number of MW?
What is the learning on the uptake, customer reaction, changes in behaviour and network benefits?

- **Enduring contracts essential for providing:**
  - Best customer proposition
  - Functional requirements and best value to the DNO
  - Though, conflict exists between ‘longer term’ contracts and duration of peak/constraint durations

- **Pricing must be competitive** though geographic requirements of DNO will limit supply and potentially increase costs

- **Aggregation across an event window as well as across multiple sites will be required**, i.e. individual sites often cannot maintain response for the duration of a full constraint window.
Thank you
DEVELOPING FUTURE POWER NETWORKS

PROJECT FALCON
USING PRICE SIGNALS

OFGEM – 20th June 2013
PRESENTATION OUTLINE

- Western Power Distribution and Project FALCON Overview
- Why are we conducting commercial trials?
- Approach taken: With Customers and Aggregators
- The logistics: selecting sites and choosing data
Flexible Approaches for Low Carbon Optimised Networks
Presentation Objectives

• Under what circumstances will response be triggered? Is it for network operation or supplier purposes?
• What were the key features of the commercial arrangements, including the size of the price signal and number of events?
• What were your approaches to recruitment?
• What parties are involved in the recruitment, ongoing engagement and operation of the arrangements?
• How do you manage the uncertainty over activation of the DSR?
• What is the learning on the uptake, customer reaction, changes in behaviour and network benefits?
**TIMESCALES** - context for current learning and Project progress

- **2011**: Mobilise
  - Approach approved

- **2012**: Design
  - Customers recruited

- **2013**: Build
  - Billing system complete

- **2014**: Implement Trials
  - Trials Data Analysed

- **2015**: Consolidate & Share
  - Final Report Produced
COMMERCIAL TECHNIQUES

Arrangements with third parties connected on the network to change their behaviour to address network issues

Peak Lopping – pre-emptive and predictable arrangements

This form of DSM is already common place within the Distribution Charging model in the form of variable time of use within DUoS

Demand Response – reactive changes in behaviour

FALCON will be testing direct intervention methods by means of innovative commercial arrangements that award participants for positive behavioural responses in response to a signal from WPD’s control centre.
COMMERCIAL TECHNIQUES

Load Reduction

Distributed Generation

Control of customer demand to increase capacity on the 11kV network through the use of innovative commercial arrangements
COMMERCIAL TECHNIQUES

Load Reduction

Distributed Generation

Control of distributed generation to increase capacity on the 11kV network using innovative commercial arrangements
ASSUMPTIONS

Occasional constraints
Winter season peaks
Short durations
Pre-Emergency
I&C users

Under what circumstances will response be triggered? Is it for network operation or supplier purposes?
REQUIREMENTS

Suitable participants

Economic effectiveness

Reliability
What were your approaches to recruitment?

**Requirements**

**Suitable participants**

- Economic effectiveness
- Reliability
- Systems, resources & Skills

Willing participants located specifically on the sub stations that are likely to incur constraints that can be managed by DR
What were the key features of the commercial arrangements, including the size of the price signal and number of events

REQUIREMENTS

Suitable participants

Economic effectiveness

Reliability

Systems, resources & Skills

- Adequate incentive to gain the participation of potential sites but still be more cost effective than traditional reinforcement.
- NG STOR model is unsuitable.
- Availability Payment does fit use type or economic model.
- Commercial / legal frameworks conflict with multiple access to competing programmes.
How do you manage the uncertainty over activation of the DSR?

**REQUIREMENTS**

- Suitable participants
- Economic effectiveness
- Reliability
- Systems, resources & Skills

- Systems to dispatch and administer DR programme
- Participant behaviour
- DSM vs DSR
- Contracts & penalties
What parties are involved in the recruitment, on-going engagement and operation of the arrangements?

REQUIREMENTS

Suitable participants
Economic effectiveness
Reliability
Systems, resources & skills

- Open invitation to industry providers to participate in recruitment
- Benchmarking against direct EP acquisition
- Event operations directly & via third parties
- Back-office systems & contracts developed for DNOs
What is the learning on the uptake, customer reaction, changes in behaviour and network benefits?

LEARNING

Geography

Programme Operation

Network impact

Participants

Financial effectiveness

Skills Gap

Broad geography adopted to get a wide engagement with users and identify general participation potential

Increased ability to test variety of site sizes & types
LEARNING

Programme Operation

Building of new systems & processes for control room operation

Development of new back office administration and billing operation for the industry

Geography

Programme Operation

Network impact

Participants

Financial effectiveness

Skills Gap
LEARNING

Geography

Programme Operation

Network impact

Participants

Financial effectiveness

Skills Gap

Detailed data capture to assess real impact on network during and post demand response event
LEARNING

Geography

Programme Operation

Network impact

Participants

Financial effectiveness

Skills Gap

Post event attitudinal studies with participants to assess DR programme desirability and operational impact

Comparison between direct relationships with sites or via third party aggregators
LEARNING

- Geography
- Programme Operation
- Network impact
- Participants
- Financial effectiveness
- Skills Gap

Measurement of the cost of DR vs

- Traditional methods
- Alternative methods
- Participant expectations
What parties are involved in the recruitment, on-going engagement and operation of the arrangements?

LEARNING

Geography
Programme Operation
Network impact
Participants
Financial effectiveness
Skills Gap

Personnel and systems developments necessary to be able to implement DR as a BAU service within DNO business
**Project FALCON**

FALCON is a project led by Western Power Distribution (WPD) and involves a number of partners. The project is being funded by energy regulator Ofgem under their Low Carbon Networks Fund, which tasks Distribution Network Operators (DNOs) like WPD to look at ways to provide security of supply at value for money as Great Britain moves to a low carbon future.

FALCON will test six alternatives to conventional network reinforcement methods, to see how they work in practice. It will also analyse their effectiveness in different situations, modelling their impact over many years. Ultimately, FALCON will provide guidance for network planners to select the best technique from a range of options. Four of these options are based around engineering approaches that will involve modifications to the network itself.

The remaining two options are Commercial Techniques, which focus on the energy consumption behaviour of businesses. Trials will be conducted with local businesses in the Milton Keynes area and will provide opportunities for participants to receive an incentive for changing their behaviour for a short period of time. This is commonly known as a Demand Side Response (DSR).

**THE CHALLENGE**

When electricity is produced at a power station, it needs to travel through the National Grid TRANSMISSION system then on through the lower voltage DISTRIBUTION network to which the consumers are connected. As the Distribution Network Operator (DNO) for the Midlands, South West and Wales, it is Western Power Distribution’s responsibility to ensure that the installed infrastructure meets the needs of homes and businesses.

This means that the network is designed and maintained to cope with times of peak consumption, usually in the coldest days of Winter. This can lead to a huge expense and disruption, as more cables and transformers are laid. FALCON is testing smarter alternatives to reduce the need to do this.

**THE SOLUTION**

By communicating directly with users and paying them to either reduce their consumption or rely on an alternative such as emergency generators, FALCON will test the effectiveness of “Demand Side Response”. The network area that has been selected for the trials does not currently suffer from overloading constraints. It will however be benefiting from enhanced monitoring that is necessary to test the technical methods of interventions. This will allow Western Power Distribution to gain incredibly valuable information on the reliability of the service and detailed data on the network impact.

If successful it could not only improve the efficiency of the local network but also reduce CO2 and enable increased growth of renewable generation technologies.

If you are an industrial or commercial user located within the red boundary on the map below, you may be able to take part in this trial.

**For further information about project FALCON and the opportunity to discuss getting involved please contact**

Sanna Atherton
satherton@westernpower.co.uk

or

Gary Swandells
ggswandells9@westernpower.co.uk
Workstream 6
Knowledge Sharing Event

Thursday 20 June 2013

Simon Brooke
Low Carbon Projects Manager
Business as Usual DSR

- Under what circumstances will response be triggered?
- What were the key features of the commercial arrangements?
- What were your approaches to recruitment?
- What parties are involved in the recruitment, ongoing engagement and operation of the arrangements?
- How do you manage the uncertainty over activation of the DSR?
- What is the learning on the uptake, customer reaction, changes in behaviour and network benefits?
Customer engagement and research

- Some large customers have significant load at these times
- Others already appeared to be actively reducing their demand or using generation between 16:00 and 19:00

- Typical sub-station load peak between 16:30 & 18:30
- Identified areas suitable to trial demand-side response, working with customers with Maximum Capacity >400kVA
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 many customers
Aggregator led Demand Response

- Contracted with a leading aggregator and energy management specialist to offer customers package of demand side response and energy efficiency services.
- Electricity North West request reduction in demand at certain times via aggregators state-of-the-art control room who schedule load for firms while minimising disruption to their businesses.
- First location specific contracts of this kind in the country.
- Early learning - price point is often too low for intrusion frequency and duration.
- Contracts continue where customers have other drivers to participate.
Electricity North West and National Grid commissioned Pöyry 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.
Network capacity signals are amplified when there is network depletion. However frequency and duration of depletion varies across the voltage levels of the network.

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 C₂C Project

Demand response to be provided by new connections customers and/or existing customers
- New connections customers avoid reinforcement costs with demand response capability
- Existing customers receive ongoing demand response payments for demand response capability

C₂C tests customers’ willingness to enter into ‘post-fault demand response’ contracts across the range of high, medium and low fault rate HV circuits

C₂C is providing useful customer behaviour data against the variables of price, frequency of call and payment mechanism

Initial findings demonstrate great interest and contract terms as important as price

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

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
Under what circumstances will response be triggered? Constraint management (system normal) - static & dynamic

What were the key features of the commercial arrangements? PAYG and blend of availability and usage

What were your approaches to recruitment? General awareness campaign and DNO direct & aggregator approach

What parties are involved in the recruitment, ongoing engagement and operation of the arrangements? Both DNO direct and aggregator approaches

How do you manage the uncertainty over activation of the DSR? Penalties and over-purchase

What is the learning on the uptake, customer reaction, changes in behaviour and network benefits? For system normal price point too low and intrusive for most customers
The Thames Valley Vision Project

Mark Stannard
TVV Customer Manager

Scott Petersen
European Business Development Director
Smart Grid Solutions
Commercial DSR

• Target - 30 I & C Participants by Spring 2015

• 3rd Party Approach

• International Learning

• Incentives
SSEPD Engagement

- Consumer Consortium
  - 3 held since project start
  - 31% of Automated Demand Response (ADR) contacts came through consortium events and local bodies
  - TVCC events

- Focus Groups
  - 1 held since project start
  - Will be vital during the summer testing plan 2013

- Face to Face
Engaging Customers in Demand Response Programmes

Scott Petersen
European Business Development Director
Smart Grid Solutions

Honeywell
Agenda

• Honeywell Automated Demand Response Infrastructure
• Southern California Edison ADR learning points
• The role of Buildings in TVV
• Targeting Buildings for Participation
• Who's involved?
• Benefits
• The role of engagement
• Overcoming Hurdles
• Key Learning Points
Honeywell ADR Infrastructure

1. **Utility Co.**
   - DR Programme design
   - Customer liaison
   - Event management

2. **Instrument & Connect Buildings**
   - Enrol buildings
   - Site audit
   - Load shed strategy design
   - Load shed programming on BMS
   - Install ADR Gateway device
   - Commissioning & testing

3. **Software Setup & Hosting**
   - Programme setup
   - Event Control & management
   - Information reporting
   - Security management
   - Training

ADR Gateway
Compatible with 99+% of BMS systems

OpenADR 2.0b

DR Automation Server (DRAS)

**Minute-by-minute telemetry**
Southern California Edison ADR programme – Outreach Activities

Apply learning from overseas to TVV project

- Face-to-face customer meetings
- Customer ‘Town Hall’ events
- Stands at Exhibitions & Seminars
- Conference speaking engagements
- Telemarketing
- Advertising
  - Online, e-newsletters, Trade Association emails, Trade Press
- Trade Association event speaking & networking
- Direct Mail shots

Apply varied Marketing Mix
## SCE ADR programme – Outreach Activity Effectiveness

<table>
<thead>
<tr>
<th>Outreach Activity</th>
<th>Effectiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer ‘Town Hall’ events</td>
<td>- Key to success is how it is advertised, and to which audience</td>
</tr>
<tr>
<td></td>
<td>- Attendee often in the research stage</td>
</tr>
<tr>
<td></td>
<td>- Good 6 months prior to programme start</td>
</tr>
<tr>
<td>Stands at Exhibitions &amp; Seminars</td>
<td>- Resulted in very few sales leads</td>
</tr>
<tr>
<td></td>
<td>- Very reliant on attendee profile</td>
</tr>
<tr>
<td>Conference speaking engagements</td>
<td>- Effective but requires networking after presentation</td>
</tr>
<tr>
<td></td>
<td>- Reliant on attendee profile</td>
</tr>
<tr>
<td>Telemarketing</td>
<td>- Not effective due to the complexity of qualifying a prospect for the ADR solution</td>
</tr>
<tr>
<td>Direct Mail</td>
<td>- Not effective due to challenge of conveying a complex message effectively and were costly to produce</td>
</tr>
<tr>
<td>Advertising</td>
<td>- Good at creating marketplace awareness for ADR, but result very few sales leads – cost effectiveness questionable</td>
</tr>
<tr>
<td>Trade Association event speaking &amp; networking</td>
<td>- Generated few leads as attendees at these events were either in research mode, wanting to learn about ADR or hearing about ADR for the first time</td>
</tr>
<tr>
<td>Face-to-face customer meetings</td>
<td>- Due to the complex qualifying process, this was by far the most effective process</td>
</tr>
</tbody>
</table>

*Apply results to TVV project ADR outreach plan*
Using DR to strengthen reputation
The role of Buildings in TVV

Bracknell Primary Network Profile

• 84 I&C buildings with >200kW: 48MW potential peak capacity demand
• Top 30 buildings: 30MW (62%)
• 10.4MW unavailable
• 24 buildings in programme: 14.4MW (30%)
• Achieve at least 10% load reduction: 1.4MW

Progress to date

• 13 signed ADR agreements, 6 systems installed, 6 being installed & 30 organisations committed to participate
• 20-30 buildings connected by early summer’13

Prove the role buildings can take
ADR Event Results

- Commercial Office Building
  - 265 kW normal building load on 18 Sep 2012
  - 97 kW shed for 2 hours: 4pm – 6pm (36% reduction)
  - Phased increase: 10%, 15%, 25%, 36%

None of the occupants noticed!
Targeting Buildings for Participation

- Need to include mix of property type, age size & use
- Need to include the largest electricity users to provide largest impact
- Broad cross-section of building types
  - commercial, educational, public, leisure, hospitality, retail
- Which type of organisations will/won’t join?
  - Large multi-nationals more likely than local businesses
  - Organisations with strong community involvement
  - Organisations with prior DR experience
  - Organisations with whom high CR credentials are important
- On what basis will they join and continue to participate?
  - No impact/low impact load shedding

Not every building will be suitable for participation
Major Organisations have joined the programme
Benefits for Participants

- Only DR programme where organisations join for *no payment* – what’s the value?
- Be a ‘good neighbour’
- Contribute to energy security in Bracknell
- Avoid local disruption
- Let project credentials wash across brand
- Participation strengthens green credentials eg BITC CR index
- Leverage project publicity
- Be part of a groundbreaking, first-in-Europe, Ofgem sponsored project

*Communicating ‘Soft’ benefits is key*
TVV - The importance of engagement

• Early, ongoing engagement and communication with customers and communities is vital
• Customer engagement plan
• Town Hall meetings (with TVCoC)
• Focus Groups
• ‘Your Energy Matters’ – High St Advisory Centre
• Website
• Local Community events
  - The Mayor’s annual civic reception
  - Local Pride of Bracknell Awards
• Demo for DECC
• Case Studies
• Press involvement
• Awards events
• Face-to-Face meetings
• Summer programme info packs

Underpinning active and ongoing participation in the DR programme
Overcoming Hurdles

<table>
<thead>
<tr>
<th>Hurdle</th>
<th>Action to Overcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNO does not have data on end users</td>
<td>• First action is to focus on gathering &amp; confirming data to enable targeting</td>
</tr>
<tr>
<td>Need to obtain high recruitment success rate</td>
<td>• Organisation profiling</td>
</tr>
<tr>
<td></td>
<td>• Segmentation for targeting</td>
</tr>
<tr>
<td>Many buildings are not ‘DR Ready’</td>
<td>• Additional investment to access more load</td>
</tr>
<tr>
<td></td>
<td>• Business case based decisions</td>
</tr>
<tr>
<td>Legal install &amp; participation agreement required</td>
<td>• Simplify Ts &amp; Cs</td>
</tr>
<tr>
<td></td>
<td>• Explain project to Legal up-front</td>
</tr>
<tr>
<td>Momentum can stall due to other priorities</td>
<td>• Engage at senior level</td>
</tr>
<tr>
<td></td>
<td>• Recruit internal champion</td>
</tr>
<tr>
<td></td>
<td>• Keep informed and engaged</td>
</tr>
</tbody>
</table>

Identify & address Hurdles to Maintain Momentum
Key Learning .... So far

• Project resources focused early on organisation & building data gathering

• Segmentation for targeting is key

• Contact point must be senior decision maker
  Locally or Internationally
  Responsibility for Energy/CSR/Sustainability

• Fund equipment install – no cost to participate

• Project partners’ buildings on programme to establish references & real event data

• Obtain internal sponsor to drive & sell participation internally & liaise within the organisation

• Leverage pre-established senior relationships
  With existing customers to gain buy-in
  To push decisions at individual building level

• Start small/no impact to minimise ‘risk’

• Document all Learning Points on regular basis

• Financial payments would increase recruitment rates
I&C customers – DNO direct control
SoLa Bristol approach for offices and schools

Work Stream 6 – Learning Event Part 2

Philip Bale
Western Power Distribution
Innovation and Low Carbon Networks Engineer
01332 827448
pbale@westernpower.co.uk
Agenda

SoLa Bristol – LCNF Tier 2 project (Funded December 2011)
a) Under what circumstances will load be controlled? Is it for network operation or supplier purposes?
b) What were the key features of the commercial arrangements, including the size of the price signal and the number of events.
c) What are the technical requirements for the proposition?
d) What were your approaches to recruitment, and how did they differ for different I&C types?
e) What parties are involved in the recruitment, on-going engagement and operation of the direct control?
f) What is the learning on the uptake, customer reaction, changes in behaviour and network impact.
Under what circumstances will load be controlled? Is it for network operation or supplier purposes?

- Up to 19.2kWh battery storage designed for schools and offices.
- Battery storage is optimised “automatically” to save ½ hourly metered customers money based on their demand and generation power flows.
- The batteries state of charge can be controlled for network operation purposes, both charging and discharging.
- Battery charging envelopes will only be used to support the Distribution network operation when required for both voltage & thermal restrictions.
Under what circumstances will load be controlled? Is it for network operation or supplier purposes?
What were the key features of the commercial arrangements, including the size of the price signal and the number of events.

- Both schools and offices are seeking ways of better utilising their solar PV and reducing their energy bills.
- The project is testing if battery storage can shared with customers whilst reducing:
  - The impact of generation on the distribution network
  - The impact of demand on the distribution network
  - Customers bills
- The number of events is very dependent on each the local distribution network and the time of the year, the envelopes can be configured to each network.
What are the technical requirements for the proposition?

- Battery storage combined with solar PV
- System intelligence “LV Connection Manager”
- Substation intelligence “LV Network Manager”
- Communications between substations and I&C customers
What were your approaches to recruitment, and how did they differ for different I&C types?

- Bristol City Council approached their schools and office, registering interest in the project.
- The SoLa Bristol system was been offered to 27 schools and an office

What parties are involved in the recruitment, on-going engagement and operation of the direct control?

- Bristol City Council head up the I&C recruitment and on-going engagement. The system is operated automatously with a display detailing performance being provided to all buildings.
What is the learning on the uptake, customer reaction, changes in behaviour and network impact.

• Bristol City Council provide services to schools and their offices including electrical maintenance and IT support.
  – They have a very good understanding of their schools and offices needs and their future aims.
  – This information has helped to shape the project.
• Customers are keen to save energy, however sharing data and linking information to the curriculum is important.
• Space for installation of equipment will be limited and will make installations more difficult, we have prepared for equipment being installed outside.
• WPD is look forward to sharing the learning when customers are fully recruited and equipment is installed.
Workstream 6
Knowledge Sharing Event

Thursday 20 June 2013

Simon Brooke
Low Carbon Projects Manager
Direct Control in C\textsubscript{2}C

- Under what circumstances will load be controlled?
- What were the key features of the commercial arrangements?
- What are the technical requirements for the proposition?
- What were your approaches to recruitment, and how did they differ for different I&C types?
- What parties are involved in the recruitment, ongoing engagement and operation of the direct control?
- What is the learning on the uptake, customer reaction, changes in behaviour and network impact?
Innovatively releasing Capacity to Customers

<table>
<thead>
<tr>
<th>Capacity to Customers</th>
<th>Technical innovation</th>
<th>New commercial contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total available network capacity</td>
<td>Total available network capacity</td>
<td>Total available network capacity</td>
</tr>
<tr>
<td>Utilised Capacity</td>
<td>Current Demand</td>
<td>Latent Capacity</td>
</tr>
</tbody>
</table>

Combining proven technology and new commercial contracts

- Allows us to release significant network capacity back to customers
- Facilitating connection of new demand and generation without reinforcement

Apply remote control equipment to the HV circuit and close the normal open point

- Enhance network management software
- This effectively doubles the available capacity of the circuit negating the need for traditional reinforcement

To retain customers’ security of supply we will utilise innovative demand side response contracts

- These contracts will allow us to control the consumption of customers on a circuit at the time of fault

Innovative, low risk and facilitates delivery of low carbon targets
No network reinforcement - standard

PRIMARY SUBSTATION

Point of connection
Reinforcement required

NEW CONNECTION

Connection assets

Normally open point

X Circuit breaker
No network reinforcement - $C_2C$
The C₂C concept

For both new and existing customers an opportunity to participate in an innovative trial that will generate learning for the future operation of distribution networks.
Customer Engagement and Commercial Relationship

Three routes to customer

- DNO direct

- Trusted agent finder’s fee

- Aggregator represents the customer

Contract arrangements

- Managed Supply Agreement (addendum to NTC)
  
  http://www.enwl.co.uk/c2c/about-c2c/key-documents

- Aggregator bilateral contract with the customer
Direct Control in C2C

- Under what circumstances will load be controlled? When the network is depleted ie post fault
- What were the key features of the commercial arrangements? Addendum to NTC
- What are the technical requirements for the proposition? Direct remote control of incoming/ internal circuit breaker
- What were your approaches to recruitment, and how did they differ for different I&C types? Direct engagement
- What parties are involved in the recruitment, ongoing engagement and operation of the direct control? Supplier, aggregator and DNO direct approaches
- What is the learning on the uptake, customer reaction, changes in behaviour and network impact? Range of prices, positive engagement, three signed contracts