



## Smart Grid Forum Workstream 6

### I&C DSR experience from the Customer-led Network Revolution

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16 October 2014

# Questions

## Introduction

- What are you aiming to find out?
- What does the trial consist of?

## Engagement

- What challenges have you experienced in recruiting and communicating with consumers taking part in DSR, and what solutions have you developed? What is the learning on the uptake?
- Which party would you say is best placed to lead engagement?

## Proposition, consumer reaction and outcomes

- What is the customer proposition and how effectively does the trial suggest it could be realised?
- What is the learning on customer reaction, changes in behaviour and attitudes?
- What have been the most effective incentives and the main sources of complaints?
- Have any consumer risks been identified and what protection measures have been identified to overcome these?

## Technical

- What notification of DSR actions or coordination with other parties would be required if this approach becomes business-as-usual to ensure any interactions or impacts could be managed?

# Introduction

## What are you aiming to find out?

To what extent are customers flexible in their load and generation, and what is the cost of this flexibility?

- How easy is it to recruit I&C customers with sufficient flexibility to address localised network constraints?
- How willing are I&C customers to sign up to DSR contracts with DNOs?
- Can I&C provide the speed, depth and duration of response required by the DNO?
- Is the response sufficiently reliability to be useful?

## What does the trial consist of?

- 2012 trials – 3 customer sites
- 2014 trials – 14 customer sites
- A recruitment survey
- The trial of different contract forms and payment methodologies
- Manual dispatch
- Automatic dispatch initiated via an ANM system driven by transformer RTTR

# Engagement

## Q. What challenges have you experienced in recruiting and communicating with consumers taking part in DSR and what solutions have you developed?

### Challenges

- Customer identification and recruitment is a challenge but it is possible.

Engagement	Total
Sought to engage	251
Managed to speak	107
Initially interested	52
Still interested	21
Still interested (> 200kVA)	15

- We engaged aggregators to test how easy (or hard) it would be to recruit customers in areas fed from 10 primary substations.
- The investigation of over 250 sites resulted in 15 customers interested in participating.
- The exercise showed the potential to secure a cumulative total of 10MW of DSR resource from a total of 74MW available across the 10 primary substations.

- The whole process from initial identification to the signing of contracts can take a year

### Solutions

- Better access to customer details to help us make contact with named individuals
- We have developed good relationships with aggregators
- We have trialled a range of contract options
- We are supporting the development of a DSR sharing framework

# Engagement

## Q. Which party would you say is best placed to lead engagement?

- The DNOs can build effective relationships with both the aggregators and direct with I&C customers. We recruited 13 sites via aggregators and one directly.



- Contracting directly was successful with one customer for the trial,

## But..

- Working via third parties might be more efficient in the long-run as DSR participant numbers increase, especially if parties are able to share this resource.

# Engagement

## Q. Which party would you say is best placed to lead engagement?

The advantage of working with third parties (aggregators) is that they:

- Identify the customers with flexibility (who may or may not already be party to other DSR agreements, such as STOR) and put forward the proposition;
- Work with the customers new to DSR to develop the capability to provide the flexibility & provide technical assistance with metering, communications, etc;
- Execute the commercial agreements to monetise the arrangements;
- Manage the sharing of the resource (where applicable); and
- Implement & manage the operating procedures, validation, payments, etc.

Leaving the DNO to concentrate on its core business of optimising network performance.

# Engagement: The types of companies recruited



## Mining

- Contracted DSR: 2 MW
- DSR Type: **CHP Generation**



## Web-Hosting

- Contracted DSR: 0.8 MW
- DSR Type: **Diesel generation**



## Water treatment (3 sites)

- Contracted DSR: 3MW
- DSR type: **Diesel generation**



## ICE production

- Contracted DSR: 0.6MW
- DSR type: **Load reduction**



## Supermarkets (2 chains)

- Contracted DSR: 0.36 & 3.6 MW
- DSR type: **Diesel generation**



## Hospital

- Contracted DSR: 0.5MW
- DSR type: **Diesel generation**



## Telecomms (5 sites)

- Contracted DSR: 3MW
- DSR type: **Diesel generation**



## Gas production

- Contracted DSR: 5MW
- DSR type: **Load shifting**

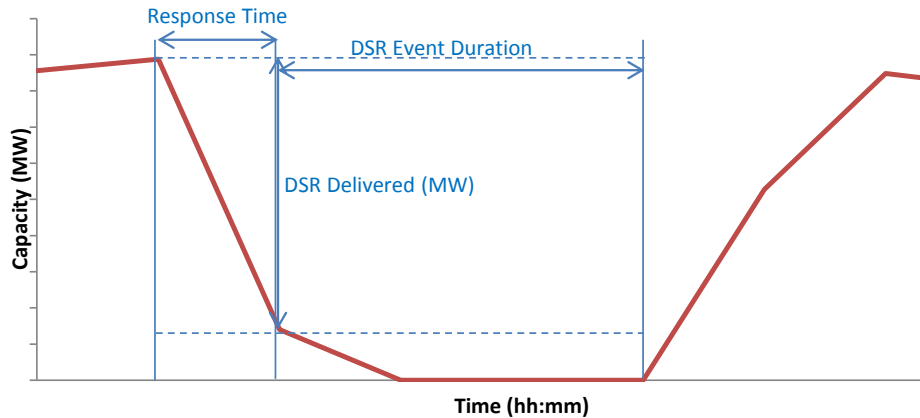
# Proposition, consumer reaction and outcomes

## Q. What was the customer proposition and the customer response?

Two performance verification methods:

Two pricing options:

### Benchmarking



### Availability and Utilisation

Availability Price of £10/MW/h

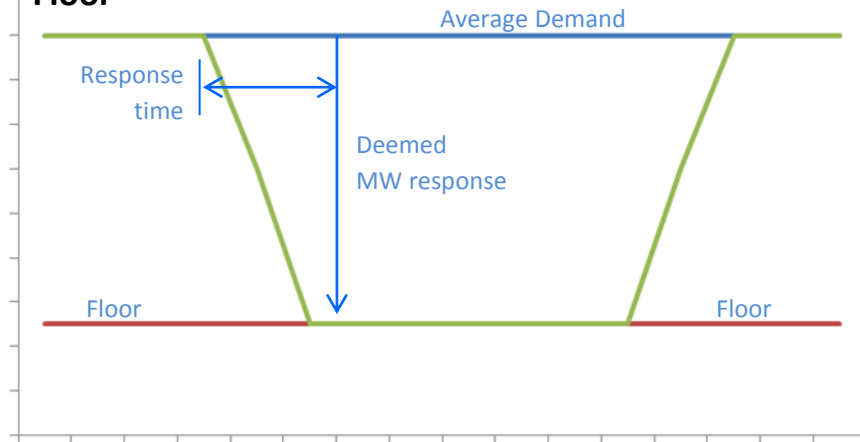
Paid for each day the response is notified as being available during the Availability window

### PLUS

Utilisation Price of £300/MW/h

Paid for the number of hours that each MW is delivered.

### Floor



### Daily charge

£306 per MW per day for HV customers

£150 per MW per day for EHV customers

Paid for each MW for each day of the Availability Window

10 customers chose the Benchmarking methodology and 4 chose the Floor methodology.



# Proposition, consumer reaction and outcomes

Pros and cons of each option

Contract Type	DNO Perspective		Customer Perspective	
	Pro	Con	Pro	Con
<b>Benchmarking</b>	DSR availability is notified & visible each week	More complicated to operate and validate	Pays more if utilized more.	Requires weekly notifications.
<b>Availability &amp; Utilisation</b>	Lower cost (if not called as often as contracted)			Only the availability payment is guaranteed
<b>Floor</b>	Simple to operate and validate	Higher cost option if not called as often as contracted	Simple - No availability notification required	
<b>Daily Charge</b>	Costs are fixed (subject to performance when called)		Guaranteed income to cover costs.	

## Protection measures

- The customer is free to choose their preferred option
- The DNO is protected against non-performance in both cases

# Outcomes – Demand shifting

Customer A: **Gas Production & Distribution**

Contract Type: Floor

Payments: Daily Payments

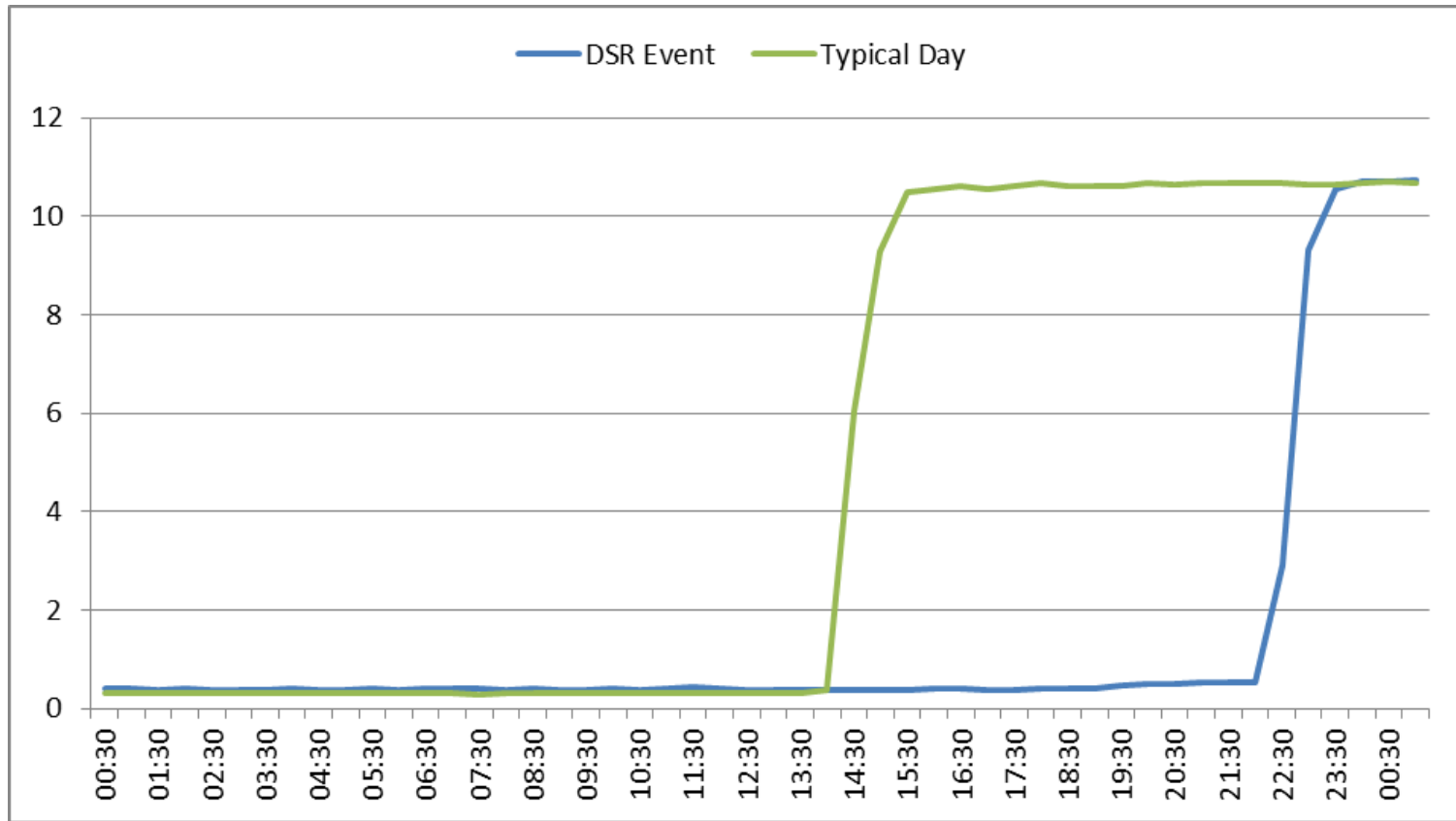
Contracted DSR: 5 MW

Availability: 3pm – 7pm, weekdays

Run hours cap: 4 hours

Response Time: 20 minutes

Season: March – April 2014



# Outcomes – Generation support

Customer B: **Supermarket**

Contract Type: Benchmark

Payments: Availability & Utilisation

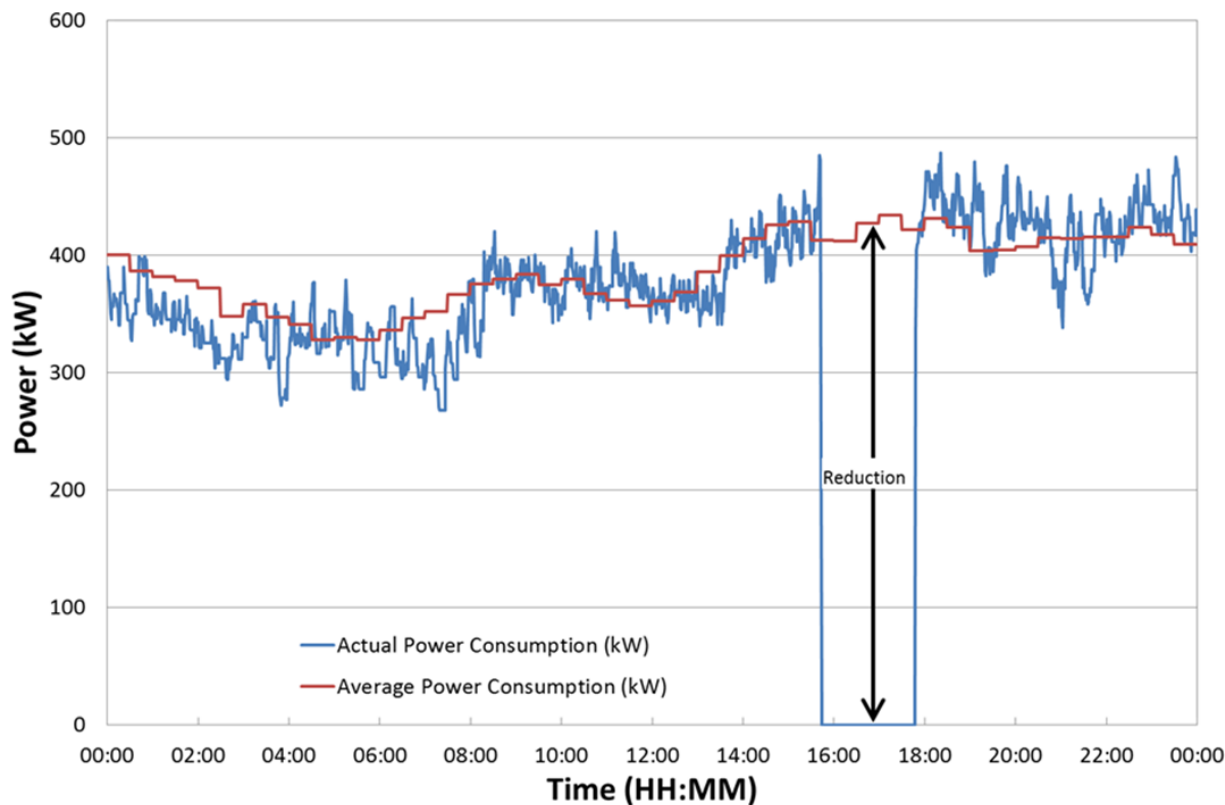
Contracted DSR: 0.36 MW

Availability: 3pm – 6pm, weekdays

Run hours cap: 2 hours

Response Time: 20 minutes

Season: November – March 2014



DSR called at 15:40:27

Generator started 15:43:28

Zero kW reached at 15:43:49

Consumption restored at 17:48:19

# Outcomes – Generation support

Customer C: **Supermarket**

Contract Type: Benchmark

Payments: Availability & Utilisation

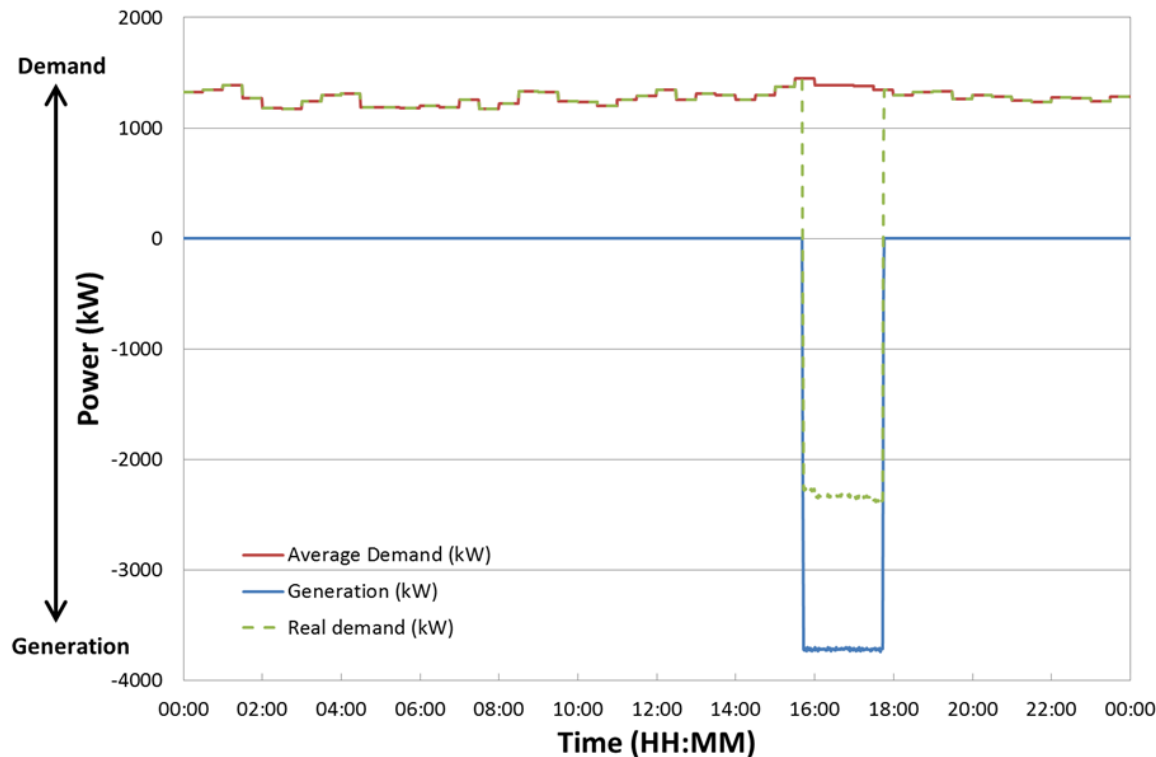
Contracted DSR: 3.6 MW

Availability: 3pm – 6pm, weekdays

Run hours cap: 2 hours

Response Time: 20 minutes

Season: November – March 2014



DSR called at 15:40:27

Generators start at 15:41:36

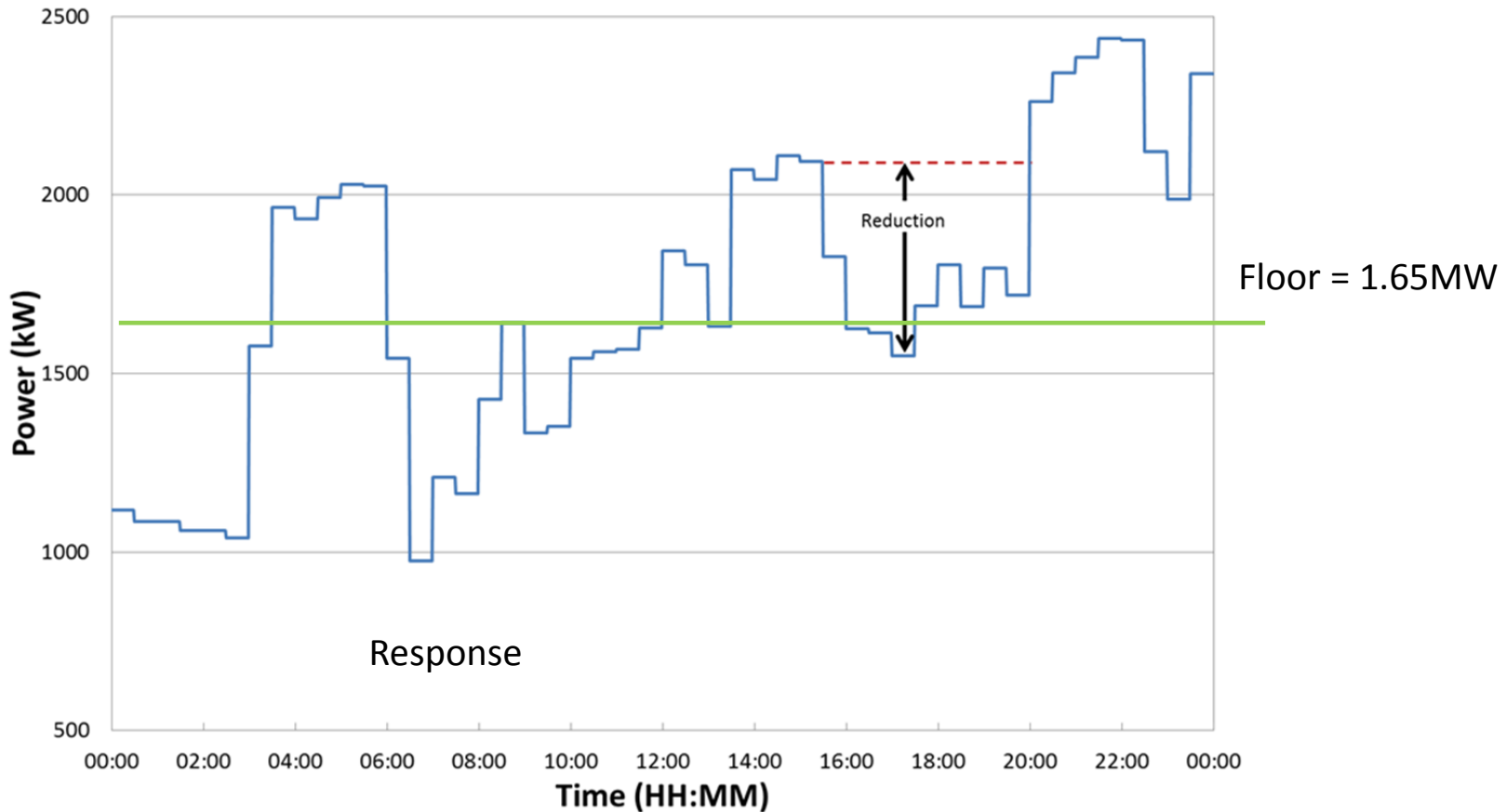
Full power output reached at 15:42:50

Generation reduce to zero at 17:49:56

# Outcomes – Demand reduction

Customer E: **Refrigeration**  
Contract Type: Floor  
Payments: Daily Payments  
Contracted DSR: 0.60 MW

Availability: 3pm – 7pm, weekdays  
Run hours cap: 4 hours  
Response Time: 20 minutes  
Season: February – March 2014



# Technical

**Q. What notification of DSR actions or coordination with other parties would be required if this approach becomes business-as-usual to ensure any interactions or impacts could be managed?**

- This aspect of operation did not form part of the CLNR trials

## **But...**

- The availability windows would be known in advance and so could be pre-notified for each year of operation;
- However, the utilization would not be definite and, when initiated, may be called either pre- or post gate closure depending on the circumstances.

# Outcomes – Overall learning

- Customers are willing to sign contracts with DNOs at STOR prices
- Customers can deliver the agreed contracted response (magnitude and timescales).
- We achieved a utilisation reliability in the order of 80%.
- This indicates that DSR could be a viable alternative to reinforcement but a probabilistic approach is needed when planning / purchasing.
- Customer identification and recruitment is a challenge but it is possible.
- It's easier to sign-up customers that participate in STOR as they are already comfortable with the concept and have found the flexibility required ... but sharing arrangements are needed if this is to transition from trial to BAU.
- In order to participate customers are looking for a bankable business case with guaranteed returns from their investment in the required metering, controls, changes to business practices and processes, etc. They may therefore need to provide their DSR services to other parties as well as DNOs.

# Any Questions?

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