

Power Responsive Investors in Flexibility Event Summary

Wednesday 10th May 2017 (15:00 – 19:30 hours) – Altitude 360, London

This document provides a summary of the Power Responsive Event for Investors in Energy Flexibility on Wednesday 10th May 2017. It includes a summary of presentations from speakers and questions from delegates, as well as links to presentation slides.

Overview and Objectives

The objective of the event was to provide clarity to a select number of investors on the opportunities presenting themselves through flexibility and provide confidence that changing flexibility needs of the GB System Operator (National Grid) are being addressed.

Presentations to delegates from National Grid, Ofgem, consultants, and analysts provided the informative element to the event, prior to a drinks reception where guests were joined by National Grid Director of UK System Operator, Cordi O'Hara, for an interview with Sumit Bose (Editor and Co-Founder Energy Live News).

Approximately 50 guests attended the event. Speakers included;

- **Lee Priestley** – National Grid (Chair)
- **Asheya Patten** – National Grid
- **Louise van Rensburg** – Ofgem
- **Jo Butlin** – EnergyBridge
- **Ben Irons** – Aurora
- **Adam Sims** – National Grid
- **Simon Bradbury** – Poyry
- **Duncan Sinclair** - Baringa

Introduction

Guests were welcomed to the event by Lee Priestley, chair for the afternoon. Power Responsive was introduced as a programme of work facilitated by National Grid, and the agenda for the afternoon was outlined. Guests were encouraged to ask questions throughout as the event was an opportunity to 'myth bust' any burning concerns, queries or misunderstandings.

Session 1 – The Big Picture

Asheya Patten (National Grid) – Future Arrangements for the System Operator

The tools traditionally used by the System Operator (SO) will not deliver customer value in the future and the SO therefore requires transformation to deliver a decentralised and decarbonised electricity system.

As part of this transformation, Ofgem have consulted on proposals for a new SO model, including:

- Enhanced roles for the SO, and
- Greater SO independence – (SO to become a separate legal company, wholly owned by National Grid).

As a result of stakeholders expressing desire for the SO to facilitate change, The Future Role of the System Operator (FRSO) programme within National Grid have identified 4 workstreams of focus; Flexibility, Network Competition, Whole System, and Level Playing Field. However, it will require all industry parties to support such changes.

The Flexibility work programme will focus on 3 core areas; Information Provision, Product Simplification, and Optimising the Use of DERs. The aspiration is to achieve functioning markets that deliver equal access to all flexibility providers by working with all stakeholder groups within the industry.

The other workstreams sitting within the FRSO framework are:

- **Network Competition** – optimising network investments
- **Whole System** – supporting network and market access to all parties
- **Level Playing Field** – facilitating the transition to a smart, flexible energy system through effective network charging.

A key incentive for the FRSO programme is the opportunity for the four workstreams to deliver better investment signals.

Despite SO legal separation not scheduled until April 2019, the SO intend to be working as a separated entity by the autumn of 2018.

Questions

- **Q: What do you see whole system looking like in 10 years?**
A: Different geographical areas have different requirements so it's difficult to say, but models and trials are being developed and tested regionally to establish a view of how the 'whole system' might look.
- **Q: How do different size investment groups find the right balance of risk to make investments in this area, given the complexity?**
A: The SO is aiming to provide the right signals to show where investment is needed. The 1MW entry point should enable wider participation and investment.

Session 2 – The Industry's Strategic Outlook

Louise van Rensburg – Ofgem – A Smart, Flexible Energy System

In a changing world Ofgem's framework needs to ensure that price signals work appropriately and that consumers are protected. But, the programme of work required to address the changing landscape is likely to be complex.

Purdah meant that it was unfortunately difficult to say too much regarding future plans. However, potential timescales for the Call for Evidence and Smart System Plan were outlined, with a view to publish as soon as possible after the summer. An indication that there will be actions for the industry through identified work packages, not just BEIS and Ofgem, should be acknowledged.

The Targeted Charging Review on residual charges and embedded benefits closed in early May 2017. The response is to be published in the summer 2017.

Questions

Q: What is Ofgem doing around localised asset owners who aren't DNOs? Will Ofgem regulate these?

A: Some of this will be featured in the Call for Evidence response. Ofgem are not aiming to regulate everything, but will be watching this closely.

Q: There are pots of money for innovation, are there any for non-networks?

A: (from BEIS) There is £50m for storage investment. We are also developing competitions around non-domestic and domestic DSR.

Jo Butlin – EnergyBridge – Flexibility in the Market: Past, Present & Future

With 20 years of practical and strategic market experience, Jo Butlin set to answer ‘How do you make money in these [flexibility] markets?’.

New entrants are now technology led as opposed to market led. It’s creating a challenging and confused market with many participants competing in the same space.

Further confusion arises in the space as new and existing I&C (Industrial & Commercial) customers are being approached by an increasing number of market actors, including aggregators and suppliers. There appears to be no clear single ownership of customer relationships.

The regulated market was originally designed for a small number of actors with reasonably defined roles (large scale generators, suppliers, and customers). The market has now expanded beyond regulated players, with the introduction of distributed renewable generation, smaller suppliers, and third party intermediaries, to name a few.

Unregulated markets currently have opportunities to access new flexibility sources. Whilst individual opportunities remain attractive, the real value is the finding where individual opportunities can be layered.

The need for flexibility is going to increase with continued growth of renewables and storage due to falling technology costs, and zero subsidy renewables. Further flexibility will be required as it becomes increasingly harder for the System Operator to balance the system at both a local and national levels

Market maturity and innovation look set to be the future for flexibility.

Dr. Ben Irons – Aurora – Flexibility and the Outlook for the GB Power Market

Increased intermittent renewable generation is having an effect on the economics of dispatched power generation. The value of ancillary services is set to nearly triple due to falling thermal generation and new nuclear with an increase of 174% balancing spend predicted from 2016 to 2030

Balancing mechanism volumes are set to double by 2030 due to the imbalance introduced by wind and solar.

Three flexible technologies have emerged to capture the new build investment opportunity.

- **Peakers** – diesel reciprocating engines, gas reciprocating engines, OCGT
- **Storage** - bulk storage (compressed air, pumped hydro), lithium batteries, and flow batteries.
- **DSR** – domestic, and Industrial & Commercial

Peakers are expected to dominate the market in the short term, with batteries becoming more prevalent in the medium term. DSR is less predictable in scale and the pace of growth.

Super peak prices in the wholesale market are expected to remain high and support dispatchable plant despite the growth in flexibility. Significant price increases were seen from 2015 to 2016.

The investment case for batteries, gas peaking plant and DSR was identified. Energy arbitrage using batteries was highlighted as nearing profitability, but still too risky for most investors given the returns on offer. Frequency response using batteries was identified as investable but difficult to finance given the short contracts available. Despite this, batteries are expected to dominate in all FFR markets, but prices likely to be very low given small, over-supplied market.

From a DSR perspective it is estimated that there is 8GW of potential DSR in the GB system, however not all of this will be viable as ‘turn down’ DSR.

Questions

Q: How does value increase in ancillary service breakdown by volume or price.

A: Value increase is driven by volume, rather than price.

Q: Super peak pricing; how sensitive is it to aggregate volume of peak demand?

A: Shape of demand matters, as peaks.

Session 3 – Simplifying the Offering

Adam Sims - Flexible Technology Capabilities

The breadth and complexity of National Grid's product and service offering was highlighted to guests. There is a perception that markets are focused on existing technology types, however the objective is to achieve markets that are investible for all.

In attempting to simplify the product offering, 'transparency and accessibility', 'longer term contracts', and 'increased tender frequency / more liquid market', were key responses to National Grid's questionnaire asking; *What commercial changes to Balancing Services/Products would you like to see to better enable you to commence participation?*

As part of the Flexibility Workstream within National Grid (highlighted by Asheya Patten in session 1), the soon to be published System Needs and Product Strategy document will provide an improved view of the System Operators requirements, a new approach to communicating system needs, information in a more timely and accessible manner, and include a consultation on future product strategy.

The requirement for flexibility was explained as being due to:

- Greater volume ranges required
- Increased volume volatility
- Reduced sources of traditional BM flexibility

Emerging trends and insights into various flexibility markets was provided, including;

- **System Inertia** - may be valued as part of both reactive power and frequency response markets. Increasing the levels of inertia on the system is less effective than reducing largest loss, therefore a specific inertia product will not be created.
- **Frequency Response** - a new response product is required which provides a route to market for fast acting response and the flexibility required closer to real time.
- **Reserve** - New reserve services must be developed to ensure;
 - Flexibility is available in near real time.
 - Market access for both BM and non-BM providers.
 - Compatibility with pan-European reserve products.
- **Reactive Power** - Markets will be designed to be more regional, potentially short term and with greater transparency of requirements. Trials will access the reactive capability of distribution connected assets through a Power Potential innovation project.
- **Black Start** - Markets will be designed with a greater regional emphasis, short term scope, and greater transparency of requirements.

Product simplification will take place in a staged approach:

1. **Rationalisation** – e.g. removal of obsolete products and grandfathering of existing contracts.
2. **Standardisation** – of the products available in the existing markets to increase market transparency
3. **Improvement** – do we move to a single product with multiple variables, or multiple products with single/few variables?

The future vision for ancillary services consists of new procurement approaches and wider markets.

Questions

Q: The difference between standard and other end of the function valuation; will this be transparent?

A: Transparency in what and why we procure, is fundamental to our approach.

Q: When will you tell us how much you are buying?

A: The System Needs and Product Strategy will outline underlying base requirements and trends.

Q: Balancing Mechanism vs Tendered Volumes; where will the route to market be?

A: In the long term we expect the commercial market to overtake the mandatory market. That's how we want to improve access.

Session 4 – Myth Busting

Simon Bradbury – Poyrey – Flexibility: Myth Busting

Poyry Management Consulting were introduced, stating that DSR isn't new as a concept, however it is reliable.

DSR awareness is on the increase, but there are still areas of misunderstanding. For instance it's not solely about back-up diesel generation, but also being truly flexible in your energy consumption.

It was further explained that flexibility is as much about being 'commercially flexible' in addition to 'technically flexible.'

Duncan Sinclair – Baringa – Could the system accommodate more renewables than we think?

Posing the question of whether we can integrate more renewables if they become economic, even with curtailment, led to the acknowledgment that the cost of renewables is decreasing quickly.

A further question around the requirement for inertia from large thermal plant and whether this would be a limiting factor highlighted the emergence of new technologies, including:

- Synchronous condensers
- Rotational stabilisers
- Battery technologies
- Flywheels
- Super-capacitors
- Inverters
- Distribution level control systems

Grid parity for renewables is on its way and is sure to have a large impact.

Questions

Q: What is the future of aggregators?

A: It's currently a crowded space, but consolidation is expected. Successful aggregators will be those who are anticipating where future value is, rather than following existing trends. There is also a role for retailers also in this space. [Answer provided by expert – this is not necessarily the view of National Grid]

Q: Who is going to pick up the investment for future demand?

A: As the role for the System Operator becomes more complex, it could mean that spend will increase. This could be as a national System Operator and/or a combination of local System Operator's.

Q: How will a price cap affect investment in this sector?

A: (answered by Poyrey and Baringa) It won't wipe out investment.

Session 5 – Networking Drinks

Cordi O'Hara, National Grid Director of UK System Operator, joined guests following the plenary sessions for networking and drinks where an informal interview and question & answer session took place with Sumit Bose. Amongst topics discussed included;

- The complexity of how to make investment decisions.
- The money is there, and there is continued value in flexibility
- Transparency of the System Operator decision making for tenders, etc.

It was further highlighted that continued feedback from events such as this (and wider afield) are vital to making continuous improvements and shape the market that works for all.

Presentation slides from the day

- **Asheya Patten** – National Grid: [The Big Picture](#)
- **Jo Butlin** – EnergyBridge: [Flexibility in the Market: Past, Present & Future](#)
- **Ben Irons** – Aurora: [Flexibility and the Outlook for the GB Power Market](#)
- **Adam Sims** – National Grid: [Simplifying the Offering](#)
- **Simon Bradbury** – Poyry: [Flexibility – Myth Busting](#)
- **Duncan Sinclair** – Baringa: [Could the system accommodate more renewables than we think?](#)

Thank You

Thank you to all who attended the Power Responsive Event to Investors in Flexibility. If you have any questions regarding the event or Power Responsive, please contact powerresponsive@nationalgrid.com.