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Power Responsive Summer Reception 2019
Delivering Zero-Carbon Ambitions

Wednesday 26th June 2019
Old Billingsgate

nationalgridESO

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This note has been prepared by National Grid ESO (Electricity System Operator) to summarise the fifth Annual Power Responsive Summer Reception. The event brought together stakeholders from across the GB electricity sector to learn about Demand Side Flexibility (DSF); discuss current and future developments; and celebrate DSF successes to date.

Power Responsive is a stakeholder-led programme, facilitated by National Grid ESO, to stimulate increased participation in the different forms of flexible technology such as demand side response (DSR), distributed generation and storage. It brings together industry and energy users, to work in a co-ordinated way. Key priorities are to raise awareness of demand side flexibility opportunities, remove barriers to entry, and evolve future flexibility markets.

1 INTRODUCTION AND SUMMARY

Power Responsive hosted its fifth annual Summer Reception on 26 June 2019. The event brought together over 300 demand side stakeholders, including industrial and commercial (I&C) energy users, storage developers, small-scale generators, suppliers and aggregators, financiers, energy experts and policy makers.

The afternoon commenced with Power Responsive's Flexibility Forum, delivering near-term flexibility updates and market transitions, wider opportunities that are on the horizon for demand side stakeholders, and the future outlook and requirement for flexibility looking out to 2030.

The evening drinks reception provided further opportunity for networking and celebrating the demand side success to date, with evening speeches from Laura Sandys (chair of the Energy Data Taskforce) and Dan Monzani (Director of Energy Security, Networks & Markets, BEIS).

2 FLEXIBILITY FORUM WELCOME

Cathy McClay (National Grid ESO) welcomed delegates and opened the summer reception by introducing the day's theme: Delivering Zero Carbon Ambitions.

The Government has announced a target of net zero carbon emissions by 2050. National Grid ESO has set its own ambitions to be zero carbon capable by 2025, supporting the notion that climate change is a once in a generation problem that we need to solve together.

Achieving the ESO ambition does not mean the electricity system will always be zero carbon – there may be more days when it is, just as we have coal free days already – but it means the ESO will not be a blocker to net zero carbon, whilst remaining technology neutral and deploying the most economic solutions.

To achieve a carbon free capable system, we will need a significant amount of flexibility. This will present additional challenges to system operability, including voltage and inertia.

We are already making progress towards a low carbon future, and at a pace much quicker than previously expected. It was predicted in 2012 that we would have 1GW of solar capacity by 2020. We already have

close to 10GW, and we are now seeing more electricity produced from carbon free sources than traditional generation. 65% of electricity from the interconnectors originates from carbon free generation.

In preparation for using Slido throughout the day, guests were asked, 'what do you consider to be the biggest barrier to flexibility today?'. A live word cloud displayed the following results.



Results indicate that stakeholders consider uncertainty, the Targeted Charging Review, revenues, and market design as the most significant challenges to overcome in order to increase DSF participation.

3 OPENING ADDRESS – PROFESSOR CHRIS RAPLEY

Professor of Climate Science at University College London, Chris Rapley, provided attendees with an opening address, setting the context for climate change and the important role the energy sector has and can play having 'upset the energy balance of the planet.'

A recent unusual weather phenomenon was highlighted: a jet stream forming a large loop of warm air circulating up towards Greenland. 40% of Greenland's ice sheet surface was melting. The Polar Regions represent a strong and clear indicator of climate change.

There was also warm air over Europe – with predictions of 40°C in France & Germany. Such heat waves lead to significant numbers of fatalities, particularly amongst the elderly.

Rising global temperatures, changing precipitation patterns, increased sea levels, and more extreme weather events will intensify the challenges of global instability, hunger, poverty, and conflict. We are ill-prepared for the climate we are provoking.

In some areas, we are seeing 440 parts per million CO₂ in the atmosphere. We are the first creatures to breath an atmosphere with that much CO₂ in it.

The climate change debate has now shifted from a science argument, through political / economic to now a social justice issue, as experienced by the enormous whaling industry of the 1950's and 60's, which quickly collapsed due to social pressure.

We need to abolish fossil fuels now. Scaling up and accelerating what we are doing on decarbonisation is critical over the next few years.

Moving to net zero carbon is good news. The industry says it will take a long time to take oil and coal out of the system. We need to get CO₂ out of the atmosphere. Iceland is using geothermal to take CO₂ out of the atmosphere. Afforestation can also help. But we would need to reforest an area about the size Brazil.

4 SESSION 1 – FLEXIBILITY TRENDS, BALANCING SERVICES, AND BEYOND

Chair for the first session of the day, Jo Butlin (CEO at EnergyBridge), introduced 'Flexibility Trends, Balancing Services, and Beyond' acknowledging that 5 years ago most of us would not know what a flexibility market is. We now have a significant contribution of flexibility active in GB markets and a wide variety of people engaged with DSF. But how do we grow DSF to become a mainstream proposition, and how are these markets maturing?

Flexibility Trends

Tom Harper, Senior Manager, Baringa Partners

The approach of having more markets for DSF is working – participation is up and prices are down, in part as result of National Grid ESO lowering barriers to entry. But flexibility operators and owners are feeling the pinch from market conditions and developments. The last 4-5 years has been the most challenging period to get new projects off the ground. For example, price compression in Firm Frequency Response (FFR), changes to Triad, the Targeted Charging Review (TCR), network charge review, and the capacity market (CM) suspension, are all areas of uncertainty.

New markets are opening with alternative sources of value, but also different risks. Such as:

- **Wholesale trading** – liquid day ahead markets hold risks in terms of price shape and trading capabilities.
- **Balancing Mechanism (BM)** – wider access to encourage new entries, but how can this be stacked with wholesale trading?

Is the current trend enough? Will these products deliver the operational flexibility we need in the next 5-10 years, and the 'firming flexibility' that we will surely need in the long term?

- **Operational flexibility** – i.e. National Grid ESO requirements met by small markets, fast reaction, high value and stackable markets. This will probably will be achieved.
- **Firming flexibility** – creating firm power from renewable output requires significant flexibility, huge investment, mobilisation of demand side, and electric vehicles at scale. This will be more difficult to achieve.

Flexibility Market Barriers and Opportunities

Steven Edwards, Head of Flexible Energy, SIMEC

As a large-scale industrial & commercial user of power (especially for Aluminium), Simec see the business case for the commercialisation of load and flexibility, with previous experience in the Capacity Market, Ancillary Services and Balancing Mechanism. Simec's sites have participated in the Capacity Market since 2016, including the secondary market this year. Whilst they have demonstrated Dynamic Frequency Response, Simec have found it difficult to integrate with other assets. Static response, however, has proven more viable and of sufficient volume to show marginal returns, and the focus is now on imbalance and optimising their position in the wholesale market.

Simec assessed the value and their experience of the Capacity Market, Ancillary Services, and the Balancing Mechanism:

Capacity Market

The Capacity Market has seen significant value delivery to the group and Simec expect to remain engaged with expectation that the £/MW will rise, having already benefitted from the introduction of secondary trading this year. However, it's important to highlight that the business see the Capacity Market as part of the same market as Balancing Services, and perception is therefore influenced by experiences elsewhere, as has the suspension of the Capacity Market and several rejected applications. As a result, Simec deeply discount Capacity Market income, which cannot therefore be used to justify future investment.

Simec remain engaged with the Capacity Market, but pose two questions:

1. Given the FES 2019 anticipates the 2050 net zero target being met, why are prices in the CM still set by the Cost of New Entry of Gas CCGT?
2. If running a low inertia network through a summer low is an increasing challenge, why doesn't the CM also value load?

Ancillary Services

Simec have historically had Ancillary Service activity on a number of sites, and have successfully demonstrated dynamic frequency response at their Rotherham and Lochaber locations, notably taking circa 12 months to implement. They conclude that aggregated portfolios must comprise significant embedded diesel/gas generation, and they identify a number of learnings/challenges, including:

- confusion by the application of testing requirements on aggregated portfolios.
- locking industrial response out of the dynamic market seems at odds with an ambition to run the network carbon free by 2025.
- frustration by the lack of clear data on the market, making it very difficult to track the relative performance of aggregators.
- accepting that the role of industrial loads is limited to the static market, Simec are encouraged that new interconnectors will increase the largest loss the market must cover.

Balancing Mechanism

Gaining an understanding of the BM is very difficult for new entrants; existing players don't readily share insights, and aggregators don't yet have a detailed picture. However, Simec consider themselves lucky to have an internal power trading function, which has helped build the case for investment, without which they would not have progressed. Simec assets are well suited to BM operations. Clear sight of how value is accrued via published data, and a non-linear response curve of assets is not limited (as it is in the ancillary services), which translates into larger swings and greater value. Registration in the BM has been an unnecessarily long-winded process, yet Simec see significant opportunity for other industrial & commercial (I&C) businesses.

Flexibility Market Barriers and Opportunities

Colm Murphy, Electricity Market Change Delivery Manager, National Grid ESO

National Grid ESO wants to be a facilitator, not a blocker, to a more flexible energy system of the future, with new players and more competitive markets.

This year the ESO became a legally separate entity, publishing its Forward Plan with a focus on:

- Managing system balance and operability
- Facilitating competitive markets
- Facilitating whole system outcomes
- Supporting competition in networks

The UK remains one of the most reliable energy systems in the world allowing the ESO to be ambitious in its plans to be capable of operating a carbon free by 2025. In doing so, it is necessary to transform services into simple, fair and transparent markets. The opportunity to decarbonise our society, starting with the electricity system, and drive down prices is huge if we create the right markets and the right solutions. But this is unlikely

to be without short-term pain. The ESO continue to review and reform it's reserve and response markets to reduce barriers to entry, whilst creating new opportunities and markets for demand side participants.

Response Reforms

- **Market:** Moving from monthly pay-as-bid tenders by EFA block to weekly pay-as-clear auctions, month ahead only tenders, and developing a day-ahead auction design.
- **Product:** Undertaking work to implement new fast and slow response product suite.
- **Accessibility:** Moving from spreadsheet based tender submission to trial a single platform for the day ahead response market, and e.g. moving from upfront testing to on-going performance management.
- **Data and Communications:** Moving from onerous up front testing and ad hoc offline performance monitoring, to API-based data, investigating innovative testing alternatives for DSR and a design for new monitoring approaches.

Auction Trial

The weekly auction trial is a great step forward, moving away from longer-term procurement timelines to a pay-as-clear auction. This approach to Frequency Response procurement should provide participants with greater flexibility to move between markets, provide clear pricing signals, and ultimately facilitate market access to variable generation. At the time of the Summer Reception two auctions had been held, procuring a total of 60MW.

Reserve Reforms

- **Market:** Moving from a pay-as-bid tender to monthly EFA block tenders to a likely pay-as-clear market, whilst assessing the removal of utilisation prices to be in line with other European reserve markets, increasing market transparency and facilitating competition.
- **Product:** Currently bespoke with variable initiation speeds for positive energy, moving towards standardised products including introducing negative reserve and interaction with standardised European products.
- **Accessibility:** Moving from spreadsheet based tender submission to testing a single platform for reserve markets.
- **Data and Communications:** Limited up-front testing and ad-hoc performance monitoring, moving toward implementation of standard testing and performance monitoring policy.

New Opportunities

Balancing Service market reforms alone may not deliver the required volume of flexibility as the potential earnings from individual markets may be insufficient to support the investment case for flexible assets. Instead the assets must be able to stack revenues across a range of markets including the Wholesale Market, Balancing Mechanism and Capacity Market.

- **Wider Balancing Mechanism Access** – The ESO is engaged in a spectrum of activities to enable greater participation in the Balancing Mechanism, including: how providers move from non-BM to BM contracts; reducing time and cost of technical connection to the BM; systems for dispatch of aggregated BMUs; work to improve data from aggregators to us, and better settlement data.
- **Project TERRE** – The ESO is fundamentally reviewing and reforming its response and reserve products to align with future operability needs and work in conjunction with pan-European standard products. Project TERRE will realise a 13 million euro per annum benefit to the GB consumer. National Grid ESO is planning on procuring an estimated 25% of their total requirement from TERRE, which shows that it will be a lucrative opportunity for DSR providers to add to their value stack.
- **Distributed Restoration** – Traditionally, Black Start services have been procured from reliable larger power stations and interconnectors. However, as we transition to more distributed energy resources on the electricity system and fewer large power stations, there is a need to adapt and develop technologies and capabilities to work with the new energy landscape. The ESO is investigating alternative routes to system restoration, and how disparate assets can be brought together to form a

controllable, stable and scalable platform for recovery. In parallel, a market approach for the procurement of these services will be investigated.

- **Intermittent Generation** – Realising the full potential of cleaner forms of renewable generation is a challenge due to its often intermittent / uncertain nature precluding it from entering longer term balancing markets. Code changes and the FFR weekly auction trial have seen steps towards removing barriers to intermittent generation participating in markets. Measures are also being taken to improve the accuracy of information through the Power Available project which will look to provide an operational metering signal received from Power Park Modules (e.g. wind) that combine live weather readings with plant capability to provide a dynamic, real-time indication of maximum potential output.
- **NOA Pathfinder Projects** – the system needs are changing with greater extremes and more volatility. Pathfinder projects follow a 'learn-by-doing' approach to seek a wider set of options to these transmission operation challenges including consideration of commercial solutions. Consumer bills can be reduced through ensuring we identify and evaluate all options for network development. Through evaluating a range of solutions using a Network Options Assessment type approach options can be assessed that will deliver greater consumer value.

Charging Reforms

Andy Burgess, Deputy Director, Energy System Transition, Ofgem

Ofgem's key aim is to ensure consumers benefit and receive value from the GB energy system.

Changes in the system means changes in regulation, but Ofgem need to get the right incentives in place for market actors cost recovery. Current areas of focus include:

- **Retail reforms:** Retail markets work well, facilitating access to the benefits of flexibility to consumers, and protecting vulnerable consumers.
- **RIIO-2:** Incentivises overall efficiency through total expenditure mechanism.
- **Future Charging & Access:** Focuses on better access and stronger network signals for efficient use of the system.
- **System Operation reforms:** Encouraging network companies to provide flexibility and infrastructure services.

Particular focus was given to the Future Charging and Access programme, and the three key areas:

- **Access and forward looking charging reforms** look to improve the value of electricity networks by using them more efficiently and flexibly. In doing so the system will be able to accommodate more electric vehicles and other new technologies at lowest cost. Ofgem have established an industry delivery group and a stakeholder challenge group.
- **The Targeted Charging Review (TCR)** seeks to remove some of the distortions which are sending the wrong signals and therefore costing consumers money. It looks to allocate residual charges in a fairer way. The recommended direction will be highlighted later this year.
- **The Balancing Services Charges Task Force**, led by National Grid ESO, has reviewed balancing service charges, and concluded in its [final report](#) that it is not feasible to charge any of the components of BSUoS in a more cost-reflective and forward-looking manner that would effectively influence user behaviour, help the system and/or lower costs to customers. Therefore, the costs included within BSUoS should all be treated on a cost-recovery basis.

5 SESSION 2 – FLEXIBILITY SERVICE COORDINATION FOR WHOLE SYSTEM NEEDS

Chief Executive of the Renewable Energy Association (REA), Dr. Nina Skorupska, introduced the second session aiming to inform delegates of developing markets outside of the ESO, across networks, and the opportunities and challenges facing demand side providers. The session looked to demonstrate a coordinated approach between network operators, a direction of travel towards the Open Networks 'Future World B', and how wider network thinking will help to answer the ESO's vision for zero-carbon capable system operation by 2025.

A co-ordinated approach across the whole electricity system

Andy Wainwright, Business Lead, Whole System, National Grid ESO

National Grid ESO believe that a whole system ethos to industry transformation will maximise consumer value and can be achieved through a market led approach, working closely with other system operators to deliver a secure transition, which facilitates net zero-carbon emissions by 2050.

Last year the development of consistent and transparent flexibility markets was identified as a key enabler for a whole system ambition. This thinking has been reinforced in the recent [ENA Flexibility Commitment](#) and the six steps for delivering flexibility services.

Networks are working closely together with other stakeholders to ensure an efficient whole system transition. National Grid ESO is developing initiatives and sharing learnings that feed into proposed RII0-2 ambitions, including:

- Delivering ground breaking innovation projects such as Power Potential and Black Start from DER.
- Developing innovative initiatives to actively progress the whole system transition, including Regional Development Programmes (RDPs)
- Opening up markets for smaller parties through the work of Power Responsive and access to wider markets e.g. the Balancing Mechanism.

Western Power Distribution Flexibility Power Update

Nigel Turvey, DSO and Future Networks Manager, Western Power Distribution

The requirement of a market-led approach to decarbonising gas, transport, and heat was highlighted, with network operators coming together through ENA Open Networks being particularly beneficial in driving change, such as distributed solutions to system restoration.

Western Power Distribution is undertaking both self-funded initiatives and participating in wider regional development programmes, as market based solutions require input from all stakeholders, and cross network collaboration.

Flexible Power

Western Power Distribution's Flexible Power service in particular was highlighted, consisting of the Secure, Dynamic and Restore products. It's estimated that 100MW of flexibility through the service, across 12 constrained zones, could realise £25 million of reinforcement benefit.

In Phase 1, there is no liquid market in operation, instead offering a fixed price. Phase 2 will move towards a pay-as-clear market where there is sufficient competition, and based on the highest price accepted. As liquidity in distribution flexibility markets improves, Phase 3 will shorten the length of the window for which the contract price applies to - a progression towards close to real-time market operation.

Western Power Distribution is trying to make the service as open as possible, with visibility via the WPD flexibility map, a pricing strategy which provides stability, no exclusivity clauses, no obligation to provide availability, no penalties for non-delivery, only loss of potential revenue, and stackable with other revenue streams.

UK Power Networks: DSO Flexibility

Sotiris Georgiopoulos, Head of Smart Grid Development, UK Power Networks

UK Power Networks is opening its network requirements to flexibility and storage providers and see a requirement for 100MW of flexibility in order to test its [Flexibility Roadmap](#), using economic principles to maximise available opportunities. The flexibility market for UK Power Networks is just beginning to display signs of potential, having procured 18.2MW for a total cost of £453k.

As per comments by Nigel Turvey (WPD), UK Power Networks is trying to make flexibility as accessible as possible for participants and therefore working with flexibility providers to co-create services.

UK Power Networks sees longer-term contracts and lead times, improved tender interfaces and customer experience, and greater clarity of the value of flexibility as a means to improve the proposition.

Further work with stakeholders will see the introduction of new products to address:

- The facilitation of EV charging
- Planned maintenance, reactive power, and unplanned interruptions
- Generation curtailment trading

Flexibility Services – Constraint Managed Zones

Alex Howison, Flexible Solutions Manager, Scottish & Southern Electricity Networks

Scottish & Southern Electricity Networks (SSEN) see the Open Networks Project as integral to how DSO services evolve and highlighted how flexible connections can potentially offer a cheaper or quicker connection to alleviate transmission and distribution constraints, whilst deferring demand related reinforcements.

Of particular reference was the South West Active Network Project (SWAN) that will utilise Active Network Management (ANM) to provide in excess of £500m savings against equivalent traditional reinforcement and allow over 900MW's of currently queued and quoted distributed generation to connect to SSENs network. However, installation/connection costs for ANM can still be viewed negatively by new generators.

SSEN is delivering a smarter, flexible and cost-effective network that unlocks opportunities for low-carbon technologies. In 2016 SSEN led the way in announcing the first Constraint Managed Zones (CMZs) to support and unlock network flexibility in areas of constraint and hope to announce their first contracted services in July 2019. In addition, further CMZ services will be trialled and released in 2019, including:

- CMZ Prepare – Planned outage support or avoidance
- CMZ Prevent – Planned Reinforcement deferral or avoidance
- CMZ Respond – Pre/Post fault support and balancing
- CMZ Restore – Fault scenario restoration support

As part of SSENs Flexibility Now approach it is moving to a global flexibility position, extending the use of flexibility to its entire network and meeting BEIS commitments to support flexibility. SSEN is making all of its congestion areas visible on Piclo Flex, an independent marketplace for buying and selling smart grid flexibility services, and is calling upon flexibility providers to register on the site now to benefit from the opportunities provided by future CMZs.

SSEN's recent CMZs carried the ability to defer or avoid £7.5m of CAPEX reinforcement at a cost of £0.7m for CMZ flexibility services. Based on similar implementations SSEN could achieve projected CAPEX savings of over £75m up to 2030.

SSEN is investigating alternative procurement options and developing a wider suite of CMZ services, all due for release in 2019. The global call for flexibility enables SSEN an advanced view on potential providers for services ahead of their need.

6 SESSION 3 – FLEXIBILITY: FUTURE OUTLOOK & ESO AMBITIONS

The third and final session of the afternoon, chaired by Merlin Hyman (Chief Executive, Regen) focused on the future vision and direction of the GB energy system, highlighting the importance that demand side flexibility will play in building and maintaining a net-zero energy system of the future.

Government Outlook for Flexibility

Doerte Schneemann, Head of Markets for Flexibility, BEIS

It was highlighted that BEIS continue to support the Power Responsive programme and its focus on promoting access to markets, encouraging the growth of flexibility participation, and contributing to net zero commitments, aligning with BEIS priorities to drive progress and facilitate new, low-carbon technologies.

Reflecting on achievements to date, over half of 29 actions highlighted in the [Smart Systems and Flexibility Plan](#) have been implemented, with the outstanding actions to completed by 2022. The recently published [progress update](#) identified 9 new actions, including the creation of Energy Data Taskforce to unlock value from data within the energy system to deliver greater competition, drive innovation in new products, services and business models, and ultimately produce a more efficient, cost-effective system that works for consumers.

Other notable achievements have included:

- Ofgem allowing independent aggregators to access the Balancing Mechanism.
- The launch and publication of the Association for Decentralised Energy (ADE) [Flex Assure code of conduct for aggregators](#).
- Launch and report of the [Energy Data Taskforce](#).

There is now a promising and dynamic market for demand side flexibility providers, which now needs to consider how to overcome the challenges that exist.

Three areas of focus, include:

- **Need for greater competition** – open markets to new players and solutions. It's promising to see DNO commitments to open markets and address potential/perceived conflicts of interest. There is of course a need to ensure revenue streams stack up, and standardised flexibility procurement will aid this.
- **ESO facilitating access to markets** – the role is critical to opening revenue for flexibility services. The weekly Frequency Response auction trial is opening services to a wider range of technologies, and will be important for the participation of renewables into balancing services as they move to day-ahead trials.
- **Future proof energy system** – wider flexibility markets will attempt to coordinate locally and nationally. Flexibility exchanges – a market place for buying and selling flexibility – will increasingly decentralise the sector, resulting in improved data and transparency. Further comment and support was given to:
 - Energy Data Taskforce recommendations.
 - ESO steps to provide greater transparency of actions taken by the Electricity National Control
 - ESO RIIO 2 proposals

ESO RIIO-2 Ambition

Julian Leslie, Head of National Grid Control, National Grid ESO

Part of [National Grid ESO's 2030 vision](#) is zero-carbon capable operation of the GB energy system by 2025, ensuring that the ESO are not decision makers behind fossil fuel utilisation. There is therefore a requirement to replace such services with low carbon solutions and work to establish network operation needs.

The ESO RIIO-2 Business Plan has 4 main themes, each looking to contribute towards this ambition. There are a number of proposed actions within the plan that will remove barriers and create opportunities for all market players, in particular ensuring a level playing field for flexibility services from distributed generation, storage and demand side response providers.

Theme 1 - Reliable and secure system operation, to deliver energy when consumers need it

- Control Centre Architecture and Systems - New systems developed to enable dispatch of new services down to 1MW allowing more balancing and ancillary services market participants to enter.

Theme 2 - Transforming participation in smart and sustainable markets

- Market portal - To develop a single, integrated platform to participate in all ESO balancing service markets, the Capacity Market, and CfD (Contract for Difference) auctions for all assets of 1 MW and above.
- Closer to real time markets - Moving our markets much closer to real time procurement, starting with a day ahead auction for response and reserve.
- Market review - In addition to transforming access to flexibility markets, the ESO are proposing to conduct a holistic review of markets.
- Codes and code governance - Transform the process to amend industry codes, allowing strategic change to be prioritised and implemented efficiently, while ensuring that it is much simpler and less time consuming to make incremental improvements.

Theme 3 - Unlocking consumer value through competition in networks

- Driving a more consistent application process across GB, irrespective of voltage level.
- A whole system approach to accessing networks to optimise outage planning and increased notification for DER of upcoming outages and service opportunities.
- Work with stakeholders to roll out learnings from Regional Development Programmes and innovation projects to embed tools and processes for zero-carbon whole system operability, unlocking capacity to enable further connections on the distribution network

Theme 4 - Driving towards a sustainable, whole energy future

- Established closer ways of working with network organisations to streamline the connection process for smaller players.
- A pathway for zero-carbon whole system operability and beyond.

7 UNANSWERED Q&A'S FROM THE FLEXIBILITY FORUM

There was a significant level of engagement from stakeholders from the day, with many more questions posted through slido than feasible to address on the day. Unanswered questions have, where possible, been consolidated and addressed by our speakers and experts from the day. Please find the questions and responses in the appendix to this summary.

8 DRINKS RECEPTION – A CELEBRATION OF DEMAND SIDE FLEXIBILITY ACHIEVEMENTS

Following the afternoon Flexibility Forum, guests gathered to hear speeches from Laura Sandys (Chair, Energy Data Taskforce) and Dan Monzani (Director, Energy Security, Networks & Markets, BEIS) .

Laura Sandys, Chair, Energy System Data Taskforce

The taskforce recently reported its findings. Those who had challenged and input into the work were thanked. It was acknowledged that the ESO has less visibility of what is happening on networks since the system had become more distributed and therefore the requirement for system data is significant.

The Energy Data Taskforce considered how to unlock the value of data and digitisation from flexibility and enable innovation, which has become increasingly challenging in a multi-actor system.

The taskforce had two key approaches:

- **Data gaps** – filling the gaps from assets we don't know about, where they are, and how they perform.
- **Quality of data** – in which the energy industry lags some way behind a number of other sectors such as food and transport. However, energy can make huge strides forward through the digitisation of the sector.

Three building blocks will enable and facilitate improvements in the use and transparency of data across the industry:

1. **Data visibility** – a data catalogue, what data you hold with common metadata and standards.
2. **Registration strategy** – requirement for a common register and process.
3. **Digital map** of the entire energy system with the ability to layer additional data enabling enhanced decision making.

The energy industry is good at making things complicated, but it's important that we find a simple way to progress. It may take 10 years to achieve the necessary quality of data.

Industry stakeholders were encouraged to share their data, regardless of the quality, otherwise we are simply de-optimising our sector. Progressive companies should be open to sharing their data.

Dan Monzani, Director, Energy Security, Networks & Markets, BEIS

The House of Lords are debating the UK's intent to achieve net-zero carbon emissions by 2050. The UK is the world's first major economy to legislate for that level of ambition, and includes a long-term strategy for energy security, underpinned by the level of transformation in the sector, and evidenced by the fact that half of our flexibility now comes from low carbon sources. All new EV charging points are to be smart enabled from July 2019. The Secretary of State's energy white paper – due to be published in the summer of 2019 - will provide guiding principles such as agility, and market based solutions, that will build upon the [Smart Systems and Flexibility Plan](#).

Progress was identified in a number of areas, including:

- Ofgem consulting on storage licence to reduce some of the double charging.
- DNOs flexibility volumes tendered on platforms are helping to resolve conflicts of interest.
- Good access to existing markets, and the ESO ambition to operate the system at net-zero by 2025.
- Excellent work of Energy Data Taskforce, with a need to deliver against it.

However, it was acknowledged that further progress is required to complement renewable generation with flexibility and the Capacity Market, with projects often paired with batteries or other forms of flexibility at present. An engineering taskforce for standards, system requirements, and technology neutrality could be required. A review of codes and governance may facilitate a more agile system.

Speeches concluded with a call to Power Responsive stakeholders to continue to develop new business models, and for the system to be 'value reflective' with users rewarded on the value they contribute to the system, and no more.

9 THANK YOU FOR YOUR INVOLVEMENT

We are grateful for the participation of our speakers and chairs, and would like to thank those who have assisted us in inviting their members and stakeholders to the Summer Reception.

Thank you to those who exhibited at the event:

- Centrica Business Solutions
- Charging Futures
- Cornwall Insight
- Energy Pool
- Energy Storage Network
- Engie
- Flexitriity
- GridBeyond
- ICON
- KiWi Power
- Lane, Clark & Peacock
- Major Energy Users Council
- National Grid ESO
 - Black Start from DER
 - Commercial Solutions for Network Developments
 - Balancing Services
- npower Business Solutions
- Open Energy
- Scottish & Southern Electricity Networks
- Upside Energy
- Western Power Distribution

Thank you to Sustainability First for its continued support to the Power Responsive programme and for assistance in forming the agenda for the summer reception.

10 APPENDIX A – UNANSWERED QUESTIONS

Capacity Market

Q. With the capacity market clearing at 77p per kW, is it time to accept that this service provides limited value to the network, and should therefore be abandoned?

A. (BEIS) This price was a result of a unique set of factors. The result doesn't tell us much about future T-3 and T-4 auctions, as the factors which led to the T-1 result are unlikely to arise in the same way.

Technology Neutrality v Climate Change Agenda

Q. Do renewables and battery de-ratings represent a major market distortion under a net-zero carbon goal?

A. (BEIS) The aim of the Capacity Market is to deliver secure electricity supplies at least cost to consumers. De-rating factors reflect the contribution that individual technologies make to security of supply. The Government has introduced a number of other policy schemes to support the roll-out of low carbon energy generation.

Q. What is being done to incentivise the major capital investments and new technologies needed to achieve a zero-carbon grid?

A. (BEIS) Government has announced up to £557m (in 2011/2012 prices) of annual support for the Contracts for Difference (CfD) scheme, which, by providing a degree of income stabilisation for new projects, gives developers the confidence they need to deliver substantial investment in new low carbon generation projects. We have just entered the third CfD allocation round which could deliver up to 6GW of new renewable capacity, and intend to run future rounds around every two years. Depending on the auction prices, we expect to support the delivery of between 1 and 2GW of new offshore wind every year in the 2020s, and up to 30GW offshore wind by 2030, provided costs continue to fall. In November 2018, the government published a CCUS Action Plan setting out its views on the next steps that industry and Government need to take to enable the development of Carbon Capture, Usage & Storage in the UK.

Project TERRE

Q. While you are committed to the delivery of Project TERRE, is it not still dependent on the nature of Brexit?

A. (National Grid ESO) There is a positive business case for GB participation in TERRE – this has been estimated as 13m euros per annum. In the event of leaving the EU without a deal we would need to consider how we might still participate in TERRE from a legal perspective but our position is that it still has benefit. In the event of a deal the two-year withdrawal agreement means that obligations under EU regulations still apply and so we would continue with TERRE unaffected.

Network Solutions

Q. How does ESO calculate the price offered to the market for flexibility services which defer constraint based network capacity investment given uncertain demand growth?

A. (National Grid ESO) We model a range of demand and supply scenarios from the ESO FES background along with forecasts for fuel prices and technology costs. To model these, we use the third-party tool [Bid3](#). This allows us to calculate the benefit to consumers for reducing network constraints across boundaries against the cost of investing in assets or commercial solutions. We aim to minimise total constraint costs and investment costs in the network whether from physical assets or flexible services or otherwise.

Charging

Q. Is increasing VAT from 5% to 20% on solar and home storage an example of disjointed policy? What does this mean for flexibility volumes?

A. (BEIS) We are sympathetic to concerns raised by industry on this matter. It is important to note that HMRC's consultation on proposals to revise this aspect of VAT policy, and subsequent legislation introduced to implement these proposals, are a response to the ruling of the EU Court of Justice (ECJ) that the scope of the UK's reduced rate for Energy Saving Materials (such as solar panels) was inconsistent with EU law. The UK is legally required to comply with the ECJ ruling or face daily fines.

Nonetheless, the UK Government was able to negotiate several important compromises with the ECJ, which ensure that solar and storage packages will still benefit from the reduced 5% rate of VAT under certain circumstances. In particular, the 5% rate will continue to apply where material costs make up less than 60% of total installation costs, and also where the installation is provided to the following types of customers:

- a) the over 60s;
- b) those receiving benefits;
- c) housing associations; and
- d) certain other residential properties, including care homes, children's homes and student accommodation.

In addition, VAT continues to be zero rated for installations in new building housing. It should be noted that HMRC clarified in 2017 that the reduced VAT rate of 5% for solar and storage, would only apply in cases where both are purchased from the same provider and installed at the same time. The higher rate would apply in all other cases. Therefore, the changes announced in practice only impact upon the specific scenario where storage and solar are purchased from the same provider and installed at the same. Significant other segments of the market (e.g. retrospective addition of storage to rooftop solar PV) are unaffected by the change and most domestic solar PV installations (without batteries) will fall below the 60% threshold.

The Government is also continuing to work closely with Ofgem and industry to remove policy and regulatory barriers to storage technologies through the actions we set out in our Smart Systems and Flexibility Plan. Going forward, the Government will continue to keep all taxes and reliefs under review. In

line with the Government's commitment to ambitious climate action we are interested in exploring options for minimising and reducing the tax impact on green measures.

Future Strategies

Q. Why are policy makers/regulators not developing more holistic planning for the future energy system, but instead focus on small changes to traditional solutions?

A. (BEIS) The Government has a clear vision for the future energy system, and we recently became the first major economy to pass legislation committing to net zero emissions. In 2017, Government published the Clean Growth Strategy, outlining a holistic approach to decarbonising our economy through the 2020s, and the upcoming Energy White Paper will take a long-term view of the development of the energy system out to 2050, consistent with the government's climate change goals.