



power
responsive

Power Responsive Conference 2017
Delivering the Future Together

Tuesday 27th June 2017
Emirates Stadium, London

national**grid**

Power Responsive Conference 2017

Delivering the Future Together

Introduction

National Grid hosted the third major **Power Responsive Conference – Delivering the Future Together** on 27 June 2017 at the Emirates Stadium, London. The event brought together 350 people – including industrial and commercial (I&C) customers, storage developers, small-scale generators, suppliers and aggregators, finance providers, energy experts and policy makers.

Power Responsive is a collaborative programme of work to promote the participation of I&C demand side flexibility in GB electricity markets, and address barriers to growth and accessibility. The conference focused on how we make the transition to a radically different energy system in future, progress made over the past year and next steps required. The event was structured around three themes: **awareness, confidence** and **simplicity**.

This document summarises discussions from the day. For more information, please visit www.powerresponsive.com.

Cordi O'Hara (National Grid) opened the event, highlighting the growth of interest and participation in demand side flexibility over the past year. The UK is already in transition to a decarbonised, decentralised and digitised environment.

The future energy system is here. Which means changing the way the system is managed and the role of the System Operator, to ensure it is agile, appropriate and delivers the needs of the system. With a focus on: whole system thinking; levelling the playing field; ensuring access to markets; and offering greater transparency for participants.

At last year's conference, participants said the landscape for flexibility is complex with too many different products. The System Operator has, therefore, focused on:

- **Raising awareness** – improving information, publishing case studies, a step-by-step guide and the Power Responsive Annual Report, with metrics for demand side flexibility;
- **Building confidence** – considering ways to simplify balancing services, developing an improved Demand Turn-Up (DTU) product for 2017, and publishing the System Needs & Product Strategy (June 2017).
- **Future market evolution** – exploring what future flexibility markets might look like.

The System Operator has offered a clearer understanding of the needs of the system for flexibility, and is consulting with the industry, providers and customers on this. Collaboration is critical, and the team and steering group are grateful for continued support and engagement through Power Responsive.

Session 1: Building on the foundations & route-map for the future

Policy maker, regulator and System Operator perspectives – highlighting steps taken over the past year to move demand side markets forward, and potential route-maps for the future.

Jo Butlin (EnergyBridge) chaired the session in which BEIS, Ofgem and National Grid set out the steps they had taken over the past year to enable demand side flexibility and their proposed next steps. The theme for this session was ‘awareness’.

David Capper (BEIS) – The electricity system is undergoing a fundamental change. The future system is starting to emerge. Not top down. But through an increase in flexible demand – from distributed generation, demand side response, and electricity storage.

Over the past year, there has been: 1.4 GW of demand side response and 500 MW of battery storage contracted through the capacity market (T-4 auction in 2016/17); 201 MW frequency response (mostly battery storage) contracted through the Enhanced Frequency Reserve (EFR); and 2GW from two new interconnectors entering construction.

Following a joint call for evidence in November 2016, BEIS and Ofgem have been working on their smart system and flexibility plan. The general election has impacted the publication timeline, but they hope to publish shortly. Responses to the call for evidence focused on:

- **Removing barriers for smart technologies** – such as the definition of storage, clarification of the planning regime for storage and recalibrating policy/network charges.
- **Smart homes and businesses** – smart meter rollout, half hourly settlement, appliances enabled for automation, cyber security and customer protections.
- **Markets that work for flexibility** – including improved access to the capacity market, balancing mechanism, and ancillary services; enabling value stacking; and creating new local markets for flexibility.

The Government also published its Industrial Strategy in January 2017, with strong focus on smart and flexibility, recently announcing £246 million ‘Faraday Challenge’ investment to put the UK ahead on battery technology, and running three innovation competitions – on storage costs, large scale storage and demand side storage. BEIS, Ofgem and National Grid announced in January 2017 proposals for greater independence of the System Operator.

Andrew Wright (Ofgem) – Regulation is at the heart of the energy system transition. It can act as a barrier or enabler, playing an important role in protecting current and future consumers.

The energy system is changing rapidly under pressure from decarbonisation, new technology, digitisation and smart systems. The rules of the system were developed based on large-scale centralised fossil fuel generation, with passive customers and networks. This is all changing – with a lower carbon mix, more active networks and demand side flexibility – so the rules need to change too.

The regulator needs to provide the right incentives for market participants and network companies, the right framework for System Operators and right approach to recover sunk and fixed costs.

Ofgem’s formal work programme has dedicated chapters on how to facilitate this change. With a focus on: **enablers** – including smart technology and the reform of residential charges; approaches to **residual charging** for networks – including embedded benefits, the targeted charging review (TCR) and price controls; **effective incentives** – for the System Operator, RIIO T2 strategy and flexibility. It is important to take a holistic approach, but Ofgem must also be pragmatic, there are urgent issues to deal with today, which are being addressed in manageable, bite size chunks with early deliverables (e.g. TCR, embedded benefits, quicker connections for distributed generation and storage).

Ofgem will publish an overall strategy on a similar timescale to the Smart System Plan. Setting out principles, goals and objectives on the changes needed, and a vision for future regulation – to drive innovation and support transformation, in line with Ofgem’s statutory duties, ensuring the regulatory framework is predictable, with the right allocation of risk. There will be a focus on: more effective network usage signals; driving whole system outcomes; and network investment risk.

Cathy McClay (National Grid) – we are operating the future electricity system today. The industry has achieved much over the last year. But there is still a lot to do, and its important to keep momentum. Looking back at National Grid’s Future Energy Scenarios work in 2012, NG predicted:

	FES 2012 prediction for 2020	Actual 2017
Solar	1 GW	12 GW
Wind	12GW	15 GW
% Embedded	12%	23%

The transition is happening faster than anticipated in 2012. There have been a number of firsts for the electricity system in 2017, including the first period with: minimum demand during the day, not overnight (25-26 Mar); no coal (21 Apr); solar output at 8.7 GW, 26% of generation (26 Mar); renewable energy providing more than half of electricity, over 70% (7 Jun); and carbon intensity at less than 100g of CO₂ per kilowatt hour (11 June), the level required by 2030.

This has meant a lot of change for the System Operator, in terms of how the system is managed and with whom they interact. There has been a 60% increase in active balancing mechanism units (BMUs) since 2014, now 3326 total BMUs. There were enquiries from 250 new potential providers in 2016, many of whom had never provided balancing services previously. A new working group on storage attracted 200 attendees. There was over 500 MW increase in flexibility from non-traditional sources in 2016.

National Grid has been:

- **Raising awareness** of the opportunities for demand side flexibility with events, clearer information and case studies, and a new balancing services webpage.
- **Building confidence** through the publication of the System Needs & Product Strategy.
- **Simplifying**, standardising and improving balancing services, with plans to publish the future product design this autumn.

They are taking a **whole system** approach, working closely with Distribution Network Operators learning by doing, e.g. shared services with Western Power Distribution for Demand Turn Up, regional development programme with UK Power Networks and the Energy Network Association’s Open Networks.

Word Cloud Results - The audience participated in a word cloud on **awareness**, responding to the question: *What further steps do you suggest to increase awareness of the demand side flexibility opportunity?*



Session 2: Opportunities & challenges in current markets and gearing up for the future

Market actor perspectives on existing demand side markets. Identifying today's successes and challenges, five-year outlook and steps needed

Rosie McGlynn (EnergyUK) chaired the session, which involved a supplier, Distribution Network Operator and aggregator giving their perspectives on existing demand side markets – covering the capacity market, wholesale market, peak avoidance, local balancing and network services. The theme for this session was 'simplicity'.

Sara Vaughan (E.ON UK) – The UK is moving away from a demand led system to a generation led system, with the possibility of demand flexing to meet generation. Consumers are becoming providers. There are opportunities for domestic customers with electric vehicles, domestic batteries, and small-scale generation.

The value of flexibility is increasing. Which is a win for customers – as they unlock value from energy not used, for suppliers – who can help them be flexible, and for the system – which can access new sources of flexibility. E.ON has over 160MW of flexibility under contract, from over 20 B2B customers. Developers need a fair rate of return, predictability, clear rules, transparent and fair procurement process, published results and prices, and predictability of pricing.

Successes: bridging for firm frequency reserve and Short Term Operating Reserve (STOR) runway to enable participation of smaller volumes; EFR has kick started battery installations; Demand Turn Up has shown how DNOs and the System Operator can work together to solve local network issues. Challenges: Ancillary service markets remain fragmented and complicated to navigate. Boundaries and intersects for networks and markets should be defined as the transformation from DNO to DSO continues. Future market arrangements will be crucial.

E.ON UK would like to see procurement of flexibility via competitive auctions, with fewer (and standardised) products, and secondary trading of flexibility products, facilitated by effective penalty regimes, avoiding life of asset length contracts. More incentives are needed for DNOs to use flexibility to optimise network operation as part of 'business as usual', with a whole systems approach to ensure no unintended consequences. Half hourly settlement could help unlock flexibility, with broader reform needed of settlement as a whole. We have made a good start, and we need to build on that.

Nigel Turvey (Western Power Distribution) – flexibility is valuable to DNOs because of significant uncertainty in the growth of demand and generation (e.g. new distributed sources of generation and electric vehicles). Flexibility offers value with potential for faster response to changing needs. It can be an enduring solution, or a stopgap where new assets are required.

WPD has been involved in a number of trials involving DSR at distribution level including: Falcon (I&C customer demand turn down); Sync (I&C Demand Turn Up); and community energy action / sunshine tariff (domestic demand turn up). They have found domestic DSR challenging, as engagement was difficult with minimal flexible load available, even when communities did much to change their lifestyles. There is I&C flexibility available, but mostly generation not demand response. WPD have made use of the DTU service less than the System Operator. Longer notice between dispatch and calls gives a better response, e.g. a week's notification in Falcon gave 90% reliability.

WPD is now incorporating this learning into Project Entire, which is I&C demand turn down in the East Midlands – with a focus on commercial mechanisms and revenue stacking, passing back value from System Operator services to flexibility providers. WPD is working on regional development plans, low voltage networks, and considering the transmission and distribution interface – given wider ambition to move to a Distribution System Operator (DSO).

Session 3: Users & providers – empowered to deliver a distributed, flexible future?

Are business providers and distributed generators willing and able to offer demand-side flexibility in these markets? Investment in distributed generation, demand side response, and storage.

Andrew Buckley (MEUC) chaired the discussion which included representatives of the storage and decentralised energy sectors, and an I&C customer, setting out some of the opportunities and challenges for the future.

Paul McCusker (AES Energy Storage) Confidence in storage has grown over last 12 months. There has been massive engagement and work with associations to open the market and investor appetite remains strong. Over 500MW of energy storage has been contracted in the Capacity Market. However, there is too much uncertainty to fully scale this industry to the levels needed by 2030. Many potential storage investors are sitting on side lines. Sizing assets to the smallest and lowest cost battery energy storage system meets the immediate need for today but not for tomorrow; such assets will struggle to adapt to uncertain and changing market needs.

The UK is one of the most proactively engaged markets in the world with a strong ambition and policy commitment. We are clearly moving in the right direction. Building longer duration, technically and commercially flexible assets that will adapt to meet changing system needs will result in lower total costs; and result in financeable assets that will further lower risks and cost of capital.

An ancient Indian parable of the blind men and the elephant was used to describe the opening storage market. Each blind man, touching a different part of the elephant could each feel this new thing, but each felt something different; all had a different perspective and all were correct in what they observed. Storage is like this; it can serve many needs but to do so, DSOs and TSOs must position themselves to capture the full value.

Tim Rotheray (Association for Decentralised Energy) – the best value and most efficient energy system is one built around the energy user rather than the producer. The system operator has significant costs to manage the system, which appear on customer bills. Customers need to be engaged. Energy and pass through costs could risk making business customers less competitive, which could impact on the support for decarbonisation. Demand side flexibility can contribute to a reduction in consumer energy bills overall, by reducing infrastructure costs.

The balancing services market is opening up. This is great, but exposes very real complexity, and an imbalance between risk and reward. There is a role for the industry, regulator, government and System Operator to address complexity. The industry is changing rapidly with new entrants and companies engaging in novel ways. When an energy customer is approached by a market actor they must be able to trust them – that what they are being offered will actually be delivered. The ADE is developing a code of conduct for Demand Side Response Aggregators, setting minimum requirements, so that customers can see who is meeting the appropriate standards. But this will need 'teeth'.

The Government's should start with the energy user. Consider how users see the energy system. For example, the Capacity Market was developed to build power stations, and aggregators were expected to sort out the complexity for customers. But customers want to understand the proposition. Which means significant cost and time for aggregators to explain flexibility markets. If the design had started the other way round – with the customer – the capacity market would look very different. The Capacity Market has substantial problems, which have not been addressed. Such as contract length, and predictability in year-ahead market. National Grid is now looking at how to open up the Balancing Mechanism (BM) – with BM 'lite'. Policy changes should start with consideration of the customer.

Session 4: Break-outs

Parallel interactive breakout sessions on:

1. System Needs and Product Strategy
2. Optimising the Use of Distributed Energy Resources
3. Customer Protection and New Business Models
4. Shaping Future Markets & Intersects

Workshop 1: System Needs and Product Strategy

Adam Sims (National Grid) led the session, which was designed to gauge initial feedback on the System Needs and Product Strategy document. The document covers existing markets, and proposals to simplify and standardise Balancing Service products. **Patrick Cassels (National Grid)** gave an overview of systems needs for: Inertia & Rate of Change of Frequency, Frequency Response, Reserve, Reactive Power and Black Start. The product strategy was outlined which includes a consultation on product design which is open until 18 July. Interactive polling allowed delegates to provide their thoughts to some selected questions from the consultation.

The issues with the balancing services products were identified as being: too many markets with different technical requirements; assessment criteria & requirements not transparent enough; and over- or undersubscribed markets. Most participants (76%) agreed with this summary of the issues, with one person considering that process for dispatch was also an issue. Standardisation is needed across the existing tendered markets (FFR, Fast Reserve, STOR) to improve transparency. Most participants (77%) felt fixing product parameters would have a positive effect on transparency and competition. There was discussion of the optimum balance between having a single product and/or multiple products. On ancillary services, 43% of participants felt that there should be multiple products with some variables, but there was a spread of views. More standard products might enable secondary trading, but how important was this? The majority of participants (59%) felt secondary trading would be positive. Some concern was expressed about the liquidity of products, as if there are not enough participants then there is no secondary market to trade in.

Depending on product design, stacking of different products may be possible, allowing providers to access multiple revenue streams, which most participants (82%) felt to be important. On contract length there was a relatively even spread with 37% wanting a mix, 34% calling for short term contracts, and 30% long term contracts. Most participants were positive (71%) about the trialling of different procurement approaches e.g. cleared price auctions, day/week-ahead markets. The simplification of products approach will involve the following stages: 1. Rationalise existing products; 2. Increase transparency and standardise products; 3. Developed improved products in conjunction with industry. Most people (79%) agreed with this approach, suggesting that National Grid needs to show leadership.

Workshop 2: Optimising the Use of Distributed Energy Resources

Rhiannon Marsh (National Grid) led the session, noting that Distributed Energy Resources (DERs) include electric vehicles, energy storage, demand side response, distributed & renewable generation, and small-scale fossil fuel generation. There are different routes to market. DER providers want to offer multiple services, which may require aggregation. Networks want to develop a more coordinated, whole system approach to aligning incentives for transmission and distribution. There are a number of possible models for route to market – where the SO, DNOs and/or multiple parties coordinate opportunities for DER providers.

Sotiris Georgiopoulos (UKPN) gave an overview of the Power Potential (TDI 2.0) project, which is exploring the transmission and distribution interface. It focuses on the creation new opportunities in the South East of England for DER connected to the distribution network to provide dynamic voltage support and constraint management services to the System Operator via UK Power Networks. There is potential for 3720 MW of additional generation in the area and savings of £412m for UK consumers by 2050. A framework agreement will be developed to cover operational and commercial requirements of parties.

Matt Watson (WPD) gave an overview of Project Entire, which looks at how to make DNO-led DSR commercially viable, as well as the DNO and SO interaction. It includes facilitating five WPD constraint managed zone (CMZ) services in the East Midlands and a managed service for customers – with simplification of DSR programmes into a single service, and stacking of multiple revenue streams. The project targets half-hourly metered customers in the area, able to reduce demand or increase generation within 15 minutes of signal and hold for at least 2 hours – either direct customers or via aggregators.

Participants set out what they think is needed in order to enable DER to offer multiple services to multiple parties, including: fewer, simpler products with clear visibility on prices, ideally starting from asset capability. Real time second-by-second metering and better data sharing/visibility. Consideration of locational tariff structures, harmonising distribution and transmission charging regimes and addressing planning permissions.

DNOs have good visibility of local issues, but less experience of developing direct relationships with DERs. There is a risk that DNOs design different systems, and some potential for conflict of interest between regulated and unregulated parts of the DNO business. Some participants suggested DNOs need to first focus on voltage constraints and facilitating connections. There was some question as to how the DSO would operate – would it become a regulated aggregator and/or use third parties to procure ancillary services.

Suggested criteria for assessing success included: transparent, fair, competitive market with live trading and clear pricing mechanisms; value for money to asset owners; services that are compatible with potential to stack revenue streams; locational signals; conflict of interests addressed; clear, simple routes to market; decarbonised grid through whole system efficiency.

Workshop 3: Customer Protection and New Business Models

Paul Lowbridge (National Grid) led the session, which considered consumer protections and the development of an industry led code of conduct for aggregators and I&C customers.

Louise van Rensburg (Ofgem) – set out the steps being taken to develop a smart, flexible system. The regulator is working to protect customers in a changing world.

Jonathan Graham (ADE) – The ADE DSR voluntary Code of Conduct will give assurance that ethical business standards are adhered to; lets customers see which providers are meeting standards; and ensures bids/proposals include common elements so different products can be compared. The code addresses five areas: sales and marketing; proposals and pre-contractual information; contract; technical due-diligence and site visit; and complaints. It will be governed and enforced through a process of: 1. Adjudication, 2. Enforcement and 3. Scheme Removal. It has been developed through a committee of aggregators, suppliers, industrial customers and their representatives. Ofgem and BEIS attended as observers. It will be published shortly, and open to consultation.

Themes discussed during the session included the need to: have informed customers to enter into informed commercial agreements; ensure the code and its content are accessible; provide assurance on cyber security; make the market look 'less scary' as customers navigate amongst aggregators; give a clear idea of potential upsides and risks to customers and aggregators; and provide assurance of standards though governance. There were concerns about over-promising reward and under-estimating risks. There were questions about the requirements on National Grid and indirectly BEIS (for the Capacity Market), as the original procurers of services, to help inform customers and manage the marketplace.

Workshop 4: Shaping Future Markets & Intersects

Asheya Patten (National Grid) led the session, which focused on how markets fit together, issues and intersects for markets other than balancing services - including the balancing mechanism, ancillary services, wholesale market and capacity market.

Balancing Mechanism (BM) - allows the SO to balance supply and demand within gate closure. BM parties provide bid and offer prices, the SO chooses most economic solution to manage residual balancing. Commercial balancing services are procured through tenders and the BM facilitates access to Mandatory Frequency Response and Mandatory Reactive Power – these mandatory services are currently open to only transmission-connected parties. Work is ongoing looking at how to widen access to the BM to 'non-BM' participants. Code modifications relating to removing spill payments for STOR, 'BM lite' (non-BM access to the BM), EU Project TERRE are currently under discussion. BM participation is difficult for smaller parties, so what is the best way to unlock potential? Benefits and risks of non-locational BMUs.

Wholesale Market - most electricity trading is over the counter, or via power exchanges (10-15% traded volume each month). Ofgem's 'Secure and Promote' initiative has increased liquidity, making it easier for smaller players to trade, but there were questions around whether baseload products dominate and most trading happens in market-making windows. The following questions were asked: whether there is potential for regional pricing signals, whether there should be further obligations on parties to balance their position, and how peer-to-peer trading could affect the market (e.g. the impact of block chain).

Capacity Market (CM) - intended to drive investment with cleared auction price to deliver capacity 1 to 4 years ahead. Parties receiving renewable subsidies are excluded. There are challenges with the CM and levels of competition in DSR auctions. There are also European developments for pan-European day ahead and within day balancing tool and balancing products (Project Terre), and a potential move toward shorter term markets.

Duncan Sinclair (Baringa Partners) – Discussed balancing at the distribution level. With the rapid expansion of DERs in US and GB, changing the way distribution systems operate. Over past 5 years over 10GW solar has been connected to the GB system, with significant queues for connecting renewables and batteries on some networks and expected future growth in electric vehicles. There is a transformation of DNO to DSO and a different way for SOs to interact. Options for balancing distribution systems include: regional price signals; dynamic element to distribution use of system (DUOS) charging; distribution system balancing platforms; and local energy markets. Participants discussed the different markets. In a potential shift to more regional/federal markets, there was some question as to how responsive customers can be to more granular and localised price signals. There was also some concern about the layering of additional mechanisms, with added complexity, and how distribution level balancing platforms were likely to interface with the BM. Perhaps a platform is needed a 'DSR-bay' where providers say what assets they have and what flexibility they can offer. Is one-hour gate closure at the right point? On the capacity market, there was concern about contract lengths. Some felt 15 years too long and referred to 1-year contracts in the US. There was a sense that although it is supposed to be 'technology agnostic' it is not because contract lengths, metering arrangements and baselines vary for different technologies. Smaller providers need help accessing different markets. Participants were also looking for some form of consolidation between the Capacity Market and Balancing Services qualification processes to reduce the administrative overhead.

Session 5: Priority Next Steps

The final session included feedback from the breakouts, and forward-looking presentations from the System Operator and an electric vehicle manufacturer.

Asheya Patten reflected on the breakout session in terms of the System Operator's future work programme, and invited representatives from each breakout to give a brief summary of the main themes discussed and recommendations, to inform Power Responsive in Year 3.

Workshop 1: Adam Sims (National Grid) – The System Needs and Products Strategy is looking at how to ensure we have functioning, competitive and future proofed products and markets. A commercial strategy paper is due this autumn, working together with the DNOs through the ENA Open Networks Programme. The System Operator is consulting to ensure its procuring methods are in line with what people want.

Workshop 2: Rhiannon Marsh (National Grid) – Optimising distributed energy resources (DERs). This means DERs offering multiple services to multiple market participants and opening access to new flexibility markets. There will be different roles and responsibilities. Themes included, transparency, the SO-DSO interface, how network operators can take complexity away from participants by bringing it 'in house', and learning through trials i.e. understanding what works and can be integrated into business as usual.

Workshop 3: Jonathan Graham (ADE) – The ADE voluntary Code of Conduct for aggregators and customers, will seek to deliver high standards. There are worries about overpromising. Need a better understanding of risks, upsides and downsides. Should be possible to compare offerings. The code might help customers to become more informed. The document will be released for consultation in July 2017, with responses due by September 2017.

Workshop 4: Duncan Sinclair (Baringa) – The session considered markets other than balancing services, including the balancing mechanism, capacity market, wholesale market, and ancillary services. There is a need for simplification, and convergence across mechanisms – currently there are different timetables and prequalification criteria etc. It may also be necessary to look at more sophisticated pricing at a regional/distribution level. Different business models can participate. There is regulatory and policy uncertainty, so we need common principles that everyone understands. The focus should be on evolution not revolution.

Common messages from the breakouts were linked to the main themes of the day:

- How to make it simple for different parties – large and small – to access functioning markets;
- Evolve the way markets are operated in a changing context; and
- Building confidence by helping facilitate customer engagement in the development of products, markets and regulations.

Eduardo Mascarell (Nissan Energy Services) – The Leaf is an electric vehicle (EV) built in 2010 which has a 24 kWh battery. Batteries have evolved, from generation 1, to generation 2, and now we have 30 kWh generation 3. All the EVs have bidirectional charging & discharging from the factory. Deploying vehicle to grid (V2G) charging infrastructure is at an early stage but will grow. Electric vehicles have the potential to change everything. The car becomes a platform giving value to the end user. Two sectors that were moving apart, will now work together because of EVs. EVs can be part of an integrated household system, e.g. with solar power, home battery storage, smart controls, connected to a smart grid. Average household consumption is 4,000 kWh/year, EVs consume 2,100 kWh/year (based on driving 7,900 miles), and 90% of the time the car is parked. EV as a tool for the grid offers: pooling, smart sourcing, unidirectional charging, bi-directional charging, DSO grid stability, peak shaving, wind park balancing, solar to vehicle and vehicle to home. There is a need to consider driving patterns of end user. The more you drive, the less you earn; the more you plug in, the more you earn.

There have been a number of installations including in Cranfield UK. The vehicle real time response closely follows the signal request shape. There is a business opportunity, and it is a cheap solution. Cars are already part of customer households. EVs enable the end user to become an agent in the energy market. At transmission level, EVs are ready to participate. At the distribution level there are already tangible revenue streams. At the residential level, benefits as part of integrated household solution need to be examined.

Charlotte Ramsey (National Grid) The SO is going through a process of legal separation, transforming the way it works and the way it is structured. This means: **changes** – tackling uncertainty, developing new tools and ways of working; **opportunities** – for participants to make money, see potential for a shift of value to balancing services space (~25% total value) by 2030, with a responsibility to open up that value; and **help** – the SO wants to be a trusted partner helping providers to navigate the change and to make the most of the opportunities that this change will bring.

Cathy McClay (National Grid) closed the conference, highlighting how quickly change is happening, and although there is commonality in what we want to achieve, there are a huge range of opinions on how to do that. She thanked everyone for their active participation in the conference to help deliver the future together.

Thank you for your involvement

We are grateful for the participation of our speakers and chairs, and for the continued support of Sustainability First.

Sustainability
first

Website: www.sustainabilityfirst.org.uk

We'd like to thank those who have assisted us in inviting their memberships and stakeholders to the conference:

- EEF
- Energy Managers Association
- Making Energy Understandable for Customers (formerly Major Energy Users' Council)
- The Airports Operators Authority Utilities Group

Thank you to those who exhibited at the conference:

- The ADE
- Ameresco
- Cornwall Energy
- DONG Energy
- Electricity Storage Network
- Endeco
- Energy Pool
- Energy UK
- Engie
- E.ON Energy
- Flexitricity
- KiWi Power
- Lime Jump
- MEUC
- Open Energi
- Origami Energy
- REstore
- The Energyst
- Western Power Distribution

Conference Slides

Please find links below to our presenter slides from the conference.

- Session 1 - [Building on the foundations & route-map for the future](#)
- Session 2 - [Opportunities & challenges in current markets & gearing up for the future](#)
- Session 3 - [Users & providers – empowered to deliver a distributed, flexible future?](#)
- Session 4 - [Breakout Sessions](#)
- Session 5 - [Priority Next Steps](#)



#powerresponsive



nationalgrid

For more information:

Visit our website: **www.powerresponsive.com**

Register to receive updates and invitations to our working groups

Join the discussion in our LinkedIn 'Power Responsive' group.

Email: powerresponsive@nationalgrid.com © National Grid, June 2017. All rights reserved.