

Power Responsive

Snapshot: Sources of demand side flexibility from asset and provider perspectives

This snapshot reflects a discussion on **sources of demand side flexibility from asset and provider perspectives** held on 31 January 2018 at the Power Responsive steering group (under Chatham House rules). Topics included experience of offering flexibility services via load response, small-scale generation and storage, including what flexibility services are being offered, into which markets, and whether certain asset types may offer untapped potential.

Aggregator Perspective

Aggregator representatives indicated the importance of a range of assets offering demand side flexibility (DSF) and that different asset types also drive varying business models.

There was general agreement that there was scope to substantially improve overall understanding of which assets provide which services into which markets. Improved data collection and reporting at an asset level were identified as critical to improving future levels of DSF participation. To support this, it was suggested there was value in building a more granular picture of DSF providers: by asset type, fuel type, business type and location.

Collecting data for MWh availability as well as MWh of utilisation was highlighted to be of significant importance. As an example, diesel generation may contribute a greater volume (MWh) of availability to STOR than CHP and flexible load, yet less volume in terms of utilisation. This reflects the economical characteristics of different asset types in influencing tender acceptance versus asset utilisation, and can be fundamental to policymaking.

In addition, aggregators noted:

- **Storage:** has experienced a solid beginning for new capital investment, and value-stacking will be ever-more important commercially to drive sufficient revenues.
- **Load response:** Transitional Auctions (TA) have brought forward significant new load turn-down capability. This TA success has demonstrated how a strong technical response is possible where the commercial incentives are sufficiently strong. Capacity Market (CM) requirements are comparatively 'straightforward' in contrast to some balancing services. In the main, TA load response participation is understood to be from large industrial processes by business customers, as opposed to heating, ventilation, and air conditioning (HVAC) in commercial / public buildings. It was felt that considerable work, including appropriate monetising of incentives for the customer, was still necessary before HVAC could emerge as a significant DSF contributor in balancing services.
- **Small-scale generation:** to date, back-up generation and Combined Heat and Power (CHP) plant has been by far the most active asset class in providing DSF into balancing services. However, significant uncertainty arises for existing back-up plant providing balancing services as a result of implementation of the **Medium Combustion Plant Directive (MCPD)**. From January 2019, existing back-up plant of 1-50MW, which does not have suitable emissions control equipment, will have an annual allocation of permitted running hours. As currently drafted, the permitted running hours exclude running for balancing services (and potentially TRIAD output). New plant holding an existing capacity contract will not be impacted on running hours in the same way for their contract duration.

Customer Perspective

Customer representatives outlined their current thinking from an asset-provider and business viewpoint.

From a customer and asset owner perspective, it was apparent that implementation of the MCPD introduces major new uncertainty and potential cost, including the provision of Short Term Operating Reserve (STOR) and other reserve services through existing back-up plant. Customers' main use of

on-site plant is to provide emergency standby or to provide power for in-business services (e.g. for pumping). A key factor in implementing the MCPD will therefore be to manage existing on-site plant within the envelope of permitted annual running hours and, where feasible, to avoid retrofit costs. Business customers therefore anticipate difficulty in demonstrating an internal retrofit case if the sole aim was to access balancing services revenues. Customers therefore regard the outlook for future balancing participation from existing back-up plant as uncertain.

It was concluded that current approaches to MCPD implementation by the Department for Environment, Food & Rural Affairs (DEFRA) and the Environment Agency may have a short-term impact on back-up plant bidding into reserve services and other DSF markets. It was identified that further clarity is required on the impact of the MCPD and suggested that this item be re-visited at the April meeting of the Power Responsive Steering Group.

A recurring theme was that a greater awareness of the demand side opportunity had now been created, but that an uncertain outlook was still prompting business customers to hold back on participation. An unclear view of future revenue potential and paybacks made it hard to demonstrate a strong internal business case. Instead, businesses continue to opt for schemes with clearer paybacks, such as LED lighting energy efficiency schemes.

From a customer perspective, key issues included:

- An active interest from different business types regarding how to participate in DSF markets – including on-site storage.
- Public sector sites are not yet participating at scale (including: MoD, NHS, and Local Authorities); with seemingly untapped potential available (e.g. back-up generation, HVAC).
- Fluctuating revenues over time for providers of particular balancing services (e.g. STOR and frequency etc.) continue to cause uncertainty in demonstrating internal business cases.
- Current high tender volumes (e.g. STOR and Firm Frequency Response) and therefore a relatively lower chance of tender success are seen by some customers as a deterrent to direct participation.
- A move to closer to real time auctions to support solar and wind (e.g. weekly) may potentially deter business customers with on-site generation or load response, as they look for greater financial certainty over longer periods than short-term auctions may offer.
- MCPD (*see paragraphs above on small-scale generation*) - MCPD is currently seen as a significant deterrent to participating in DSF balancing markets – even where substantial MWs of flexibility might be available from on-site back-up generation across multiple sites.
- DSF participation is still regarded as unduly burdensome, with substantial paperwork / legal charges for contract scrutiny. Many T&Cs are still non-standard across the industry, and many different ‘hand-offs’ and consequent transaction costs remain. This is exacerbated where a business case depends on participation across multiple sites – regionally and nationally.
- Connection asset upgrades - long paybacks for Distribution Network Operator (DNO) connection upgrades can undermine internal business cases for export from on-site generators. Long paybacks on network-related costs are compounded by MCPD, network charge review (TRIAD), and dampened Distribution Use of System (DUoS) charge differentials.
- Customers with multiple sites, such as a major retailers may wish to retain overall technical control of their assets rather than enable several points of control.
- ‘Learning-by-doing’ is becoming increasingly important for DSF at the level of the individual business customer. Business customers who already have a successful record on DSF delivery may: find it easier to offer their services into new DSF markets; find that they have the potential to ‘optioneer’ as new DSF revenue streams open up; may not necessarily face significant contract complexity or long-term lock-in.

Storage Operator Perspective

Storage representatives commented on the rapidly evolving state of storage development and its

expected participation in demand side markets. Storage was widely anticipated to make a substantial future contribution to DSF. Key issues included:

- Trials, together with the Enhanced Frequency Response (EFR) auctions have enabled initial demonstration of relatively short-duration batteries (e.g. one hour) in providing DSF. This has offered welcome experience for developers, including seeking additional aligned contracts and approaches to revenue stacking. Some units are now commissioned, but early units lack the characteristics necessary for providing enduring network services (e.g. 4 hour discharge).
- For the future, commercial incentives and signals need to be designed in ways which will stimulate grid-level storage with a capability to provide enduring network services, able to serve multiple markets, and to sufficiently stack revenue streams to permit commercial returns. This is widely acknowledged as the future pathway to ensuring good quality investment in storage, including at the 'right' location. National Grid's product road map was seen to point in the right direction.
- On-site / 'behind-the-meter' storage may potentially offer a substantial DSF resource for balancing in the future. In practice however, many future obstacles to storage participation in balancing markets are likely to mirror those of more established technologies e.g. upfront finance, complexity, costs associated with export (network, meters), contract scrutiny etc.

Distribution Network Operator Perspective

DNO representatives noted recent success for bringing forward locational DSF offers in a one-year trial in the Midlands, in fourteen designated Flexible Power Zones (FPZ) for delivery from April 2018. Other DNOs are pursuing similar initiatives. The FPZs had successfully brought forward significant offers of flexible MWs from half-hourly metered customers for at least 2 hours duration on 15 minutes notice - both for immediate and future delivery. Participants included new entrants via existing aggregators; those who had previously participated; and those building on new sites. Capacity offered included a mix of on-site generation (~half the capability offered), load response (~one-fifth), storage (a small proportion of the total offered) and 'unknown' (~one-third of all capacity offered). From this experience, DNOs conclude that there is considerable untapped DSF capacity available; that T&Cs need simplifying and paring down; and importantly, that future network investment driven by load-growth could be significantly avoided via DSF services being offered to DNOs.

Conclusions & Next Steps

A useful discussion was had by the Power Responsive Steering Group to better understand sources of DSF from an asset and a provider perspective. Significant progress has been made in raising awareness and involving more assets and actors. Some initial conclusions were:

- Untapped DSF potential exists across different assets and different customer groups.
- Outreach focused on load response (e.g. HVAC, and behind-the-meter storage) could be required.
- There is a need to continue to raise awareness among business customers of the DSF opportunity remains strong, despite current market uncertainties.
- The need to improve overall understanding of which assets provide which services into which DSF markets is important in targeting current obstacles and barriers to DSF participation. To this end, data collection and reporting at an asset-level to provide a more granular picture of current DSF participation will be helpful. Such asset-related data-mapping could provide: better insight into current high and low-levels of DSF participation and the likely reasons; possible development of a supply curve illustrating how different assets might play into different DSF services; and, potentially, development of better DSF incentives.
- Publishing case-studies via Power Responsive would be beneficial to highlight how different assets and business-types participate in DSF. Case-studies remain an important tool to help individual customers, businesses and sectors understand DSF opportunities.
- It will be important to remain alert to how implementation of the MCPD may impact current business cases for existing back-up plant to participate in balancing services.

Sustainability First
13 February 2018