

Power Responsive Steering Group

Note of Eighteenth Meeting

10th June 2020, 13:00-15:30 hrs

This note was prepared by National Grid Electricity System Operator (ESO)
This meeting was hosted virtually.

This steering group meeting focused on **the operability of the GB Electricity Grid during a period of low demand and the effects of COVID-19 on DSR Providers.**

1. Welcome and introductions

Colm Murphy (chair) opened the discussion, held under the Chatham House rule.

A summary of the previous steering group on 5th March 2020 was provided, having focused on **achieving zero-carbon operation of the GB Electricity System.** The group discussed what zero carbon capability by 2025 means and how realistic the ambition is. The group looked into how we could achieve net zero capability, and what the implications for the ESO (Electricity System Operator) and DSF (demand side flexibility) providers may be. Finally, the group discussed the significant challenges that need addressing by industry to achieve zero carbon operation beyond 2025.

2. DSF Horizon Scan

BEIS covered the following current and upcoming activities:

- **Smart Systems and Flexibility Plan-** Several virtual stakeholder events have been running recently to discuss future policy developments in that area. Lots of policy feedback has been collected.
- **BEIS and Ofgem held workshops** on market flexibility, monitoring flexibility over time, data and digitalisation and storage.
- **Upcoming BEIS workshops** will focus on aggregators, consumer participation, building and signals.
- **Policy development timelines are somewhat uncertain** due to the necessary COVID-19 response.
- **[Flex Competition Update](#)**- In February BEIS announced project Pico Exchange and project TraDER.
- **[Office of Low Emission Vehicles have published responses](#)** to the Smart Charging Consultation.
- **Work is ongoing for BSI for Smart Appliances.** Specifications for Energy Smart Appliances should be published near July 2021.
- **Regarding provision of transparent and open data-** A key recommendation from the energy data task force was to create a data catalogue.
- **Government Ministers are shifting focus from COVID-19 to economic recovery.** A task force chaired by the secretary of state has been launched to look at what we can accelerate to help with the transition to net zero and economic recovery.

Ofgem covered the following current and upcoming activities:

- A significant amount of work has been happening with stakeholders in relation to COVID-19.
- An update on [Ofgem work priorities](#) has recently been published
- Ofgem are working with BEIS to review the implementation of the Clean Energy Package. There will be more stakeholder engagement to come later this year.

Power Responsive Update:

- [Power Responsive Annual Report](#) has now been released.
- [Summer Insight Series](#) launched in place of the usual Summer Reception this year due to COVID-19. This is a series of podcasts covering a range of industry topics.
- [Residential Response](#) project is nearing completion and should be finalised around July 2020. This will be followed up by a Webinar for those looking to find out more.
- Covid-19 has delayed engagement work on future developments, however PR have agreed with the Dynamic Containment development project that they will be running something with them once the immediate operability challenges have been resolved.

3. The effects of COVID-19 on system operability and DSF Providers.

As people started to social distance, activity changed, and industry slowed down which brought down electricity demand to a significantly lower level than seen in previous years.

3.a ESO Operability Overview

Restrictions associated with COVID-19 are likely to present lower demand periods for longer durations this summer than we have seen in the past. To help manage these changing system conditions the ESO are implementing an Optional Downward Flexibility Management (ODFM) Service across the summer period and are also providing regular updates on the ESO website.

The ESO provided an overview of the effects of low demand:

The Energy Mix Changes

- Generators will only run when it is economic to do so (for it to be economic to do so, there must be demand for their energy).
- If energy demand is lower, it increases generator competition which pushes down energy prices.
- This is then impacted by other payments to renewable providers.
 - Renewables, due to either FiTs, ROCs or early CfDs, are still able to be profitable producing energy when the market price is £0/MWh
 - Renewables can continue to generate revenue even when the market price is negative
- With little sensitivity to the price, renewables will always run when it is windy or sunny
- Nuclear will always run based on their design
- Hence the units which are displaced are the fossil and water units
- The energy mix is now predominantly made up of non-synchronous (electronics converting DC energy into AC energy) units which don't provide services for Stability, Restoration, Voltage – they can provide thermal and frequency services
- The units which can provide stability, restoration and voltage are not running

The requirements of the system are larger than the demand

- The system requires services to meet the five operability challenges of, Voltage, Stability, Thermal, Frequency and Restoration
- At periods of low demand and high renewable penetration the requirements for these services increase.
- Currently the primary way of delivering these services is through large scale thermal power stations.
- The ESO is having to take a number of actions to add large units on to the system. In order to add them to the system, action needs to be taken to reduce the output of other power stations such as wind.

- There are credible scenarios during the summer at periods of low demand when the capacity of 'must-run' nuclear and solar, and the requirements to meet the operability challenge exceed the demand of the system.
- At these points additional downward flexibility is required.

The ESO took three significant actions to ensure the correct capability is available to manage the low demands:

1. A Grid Code Modification which was approved by Ofgem on May 7th gave clarity and certainty to the market around the ESO enactment and DNO requirement to carry out Emergency Instructions
2. The Optional Downward Flexibility Management (ODFM) service was introduced in rapid time for the first bank holiday weekend. The service allows commercial access to Distributed Energy Resources (DER) which when instructed effectively increases the Transmission System demand. There are now over 4,000 MW of providers signed up to the service.
3. Sizewell de-load contract reduced the requirement for downward regulation services by 600 MW and reduced response and reserve holding costs.

The group discussed and commented on the topic:

- The ODFM service shows that if the markets are available, and the products appropriately designed, then DSR assets are keen to participate.
- Certain innovation projects are looking to unlock residential response which would unlock more flexibility for the ESO.
- The group were pleased to see how quickly providers responded to the situation by participating in ODFM.
- Stability and Voltage NOA Pathfinders will help to manage these types of scenarios in the future.

3.b ESO & WPD Regional Development Programme Update.

RDPs are collaborative whole system examinations of areas of the network where increased volumes of DER are causing transmission network issues. By working together network organisations are finding ways to 'create' additional capacity through non-network solutions.

RDPs are intending to increase the use of flexibility services from DER. This would be achieved through the development of co-ordinated markets and ways of working between the ESO and DNOs. RDPs encompass a whole delivery cycle from inception through to operation.

The ESO and WPD (Western Power Distribution) explained how RDPs link with other initiatives:

Open Networks

- The ENA Open Networks project is a collaborative initiative between network organisations.
- It seeks to develop a co-ordinated approach to;
 - Flexibility markets
 - Distribution System Operation (DSO)
 - Transmission/Distribution ways of working
- RDPs form one of a number of 'design by doing' projects informing the thinking within the project.

NOA Pathfinder projects

- National Grid ESO is undertaking NOA pathfinder projects to broaden the options for meeting future transmission system needs.
- There are similarities and interactions between NOA pathfinders and RDPs;
 - Both are developing new ways of working in collaboration with stakeholders
 - Both consider greater use of DER to meet transmission system needs
 - Both inform thinking in the Open Networks project
- Given these interactions National Grid ESO maintains a good level of co-ordination between both areas.

WPD then provided an overview of the South West RDP:

- The South West Peninsula has high wind and solar potential
- A solar peak, combined with wind and/or coincident with low demand will be challenging to operate;
 - There is a risk of fast voltage collapse with uncontrolled tripping of DER.
 - Thermal congestion and interaction between transmission and distribution as a result of parallel routes
- This RDP is therefore seeking to implement new ways of managing additional DER to ensure both the transmission and distribution networks in the region remain operable in future years.
- The ESO and WPD are working together to develop a market-based solution that will allow co-ordination between WPD's Flexible Power services as well as broader ESO needs.

DER connections

- WPD have signed connection agreements with around 1.2GW of DER following introduction of RDP
- Around 500MW of this DER has connected

Technical co-ordination

- DER visibility and control achieved through co-ordinated use of WPD control telephony.
- First operational links being established this summer in the south-west for N-3 intertripping work.
- Ongoing work designing control system functionality and associated business processes.

Markets development

- Both parties would prefer a markets based approach.
- High level agreement for co-ordinated approach consistent with Future Worlds World B (co-ordinated procurement & dispatch).
- This would facilitate DER participating in multiple markets via a variety of routes .

4. Future Steering Group Dates:

- 1st October 2020
- 21st January 2021