Dynamic Containment (DC) webinar
Agenda

1. Overview
2. Service design
3. Next steps
4. Q&A session
Why do we need DC?

**Current system operability needs**

Currently, the electricity system is experiencing lower inertia and larger, more numerous losses than ever before.

Faster acting frequency response products are needed because system frequency is moving away from 50Hz more rapidly as a consequence of imbalances. This is evident in the rate of change of frequency (RoCoF) and illustrated by the interaction of size of imbalance and inertia as show below:

\[
\text{RoCoF (Hz/s)} = \frac{50 \times \text{Imbalance (MW)}}{2 \times \text{Inertia (MVA.s)}}
\]

As a system operator we need to manage both the absolute change in frequency and the RoCoF.

The variables we can control in the RoCoF equation are the size of imbalance (or losses) and the level of inertia.

- Managing low inertia is a key element of our 2025 zero carbon ambition. Our Stability pathfinder work is looking to create markets for inertia.
- The number of significant losses and their absolute size will increase as we welcome new interconnection and offshore wind onto our system.
## How will DC be procured?

<table>
<thead>
<tr>
<th><strong>Soft launch</strong></th>
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<tbody>
<tr>
<td><strong>Platform</strong></td>
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<tr>
<td><strong>Procurement</strong></td>
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<tr>
<td><strong>Settlement</strong></td>
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<tr>
<td><strong>Products</strong></td>
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<tr>
<td><strong>Period</strong></td>
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<tr>
<td><strong>Volume</strong></td>
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<tr>
<td><strong>Allow stacking?</strong></td>
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## Soft launch and full delivery

<table>
<thead>
<tr>
<th></th>
<th>Soft launch (autumn)</th>
<th>Full delivery (2021 – date TBC)</th>
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<tbody>
<tr>
<td><strong>Platform</strong></td>
<td>Manual process</td>
<td>TBC</td>
</tr>
<tr>
<td><strong>Procurement</strong></td>
<td>Day ahead</td>
<td>Day ahead</td>
</tr>
<tr>
<td><strong>Products</strong></td>
<td>LF</td>
<td>HF + LF procured separately</td>
</tr>
<tr>
<td><strong>Period</strong></td>
<td>24-hour contract</td>
<td>EFA block (potentially settlement period)</td>
</tr>
<tr>
<td><strong>Volume</strong></td>
<td>Up to 500MW of LF</td>
<td>up to 1000MW of both HF and LF</td>
</tr>
<tr>
<td><strong>Allow stacking?</strong></td>
<td>Not with existing response/reserve products</td>
<td>Yes – with the new suite of frequency response products, timescales TBC</td>
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## Delivery plan

<table>
<thead>
<tr>
<th>August</th>
<th>September</th>
<th>October</th>
</tr>
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<tbody>
<tr>
<td>21st - Draft contracts published</td>
<td>Systems and process development (NGESO)</td>
<td>1st – Go-live of DC</td>
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<tr>
<td>Engagement (webinars, Q&amp;A)</td>
<td>Final contract published for providers</td>
<td></td>
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<tr>
<td>Onboarding process for providers</td>
<td>Onboarding process for providers</td>
<td>2021</td>
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**EBGL consultation**

(1 calendar month 21/08 – 21/09)
## Service delivery

Specification is unchanged from January 2020 communication

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Detail</th>
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<tbody>
<tr>
<td>Deadband (delivery %)</td>
<td>+/- 0.015Hz (0%)</td>
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<tr>
<td>Initial linear range (delivery %)</td>
<td>From 0.015Hz to 0.2Hz (to max of 5% at 0.2Hz)</td>
</tr>
<tr>
<td>Knee point</td>
<td>+/- 0.2Hz</td>
</tr>
<tr>
<td>Second linear range (delivery %)</td>
<td>From 0.2Hz to 0.5Hz (to max of 100% at 0.5Hz)</td>
</tr>
<tr>
<td>Full delivery point</td>
<td>+/- 0.5Hz</td>
</tr>
<tr>
<td>Speed of response</td>
<td>Full delivery of required quantity (MW) in 1s (but not faster than 0.5s)</td>
</tr>
</tbody>
</table>
Service delivery

Delivery range

- Frequency 50.0Hz
- Deadband +/- 0.015Hz

Speed of response

- Min ramp rate \( RR_{min} \)
- Max ramp rate \( RR_{max} \)
- Required delivery quantity \( R_s \)

100% 5% 0%
Service rules – five key areas

• The data requirements are the same for all providers. Differences arise between BM and non-BM providers in how that data is communicated to NGESO.

• Some internal and external systems may not be ready for the soft launch – but all providers are still required to record and store data in-line with the service rules on:
  • Operational metering
  • Baselines
  • Performance metering

• Plus updates on:
  • Aggregation
  • State of energy
Operational Metering

Enduring provider routes:

BMU
- Use existing BM systems

non-BM
- Submit via Data Concentrator

If non-BM is not connected to Data Concentrator:
- NGESO will allow use of the alternative solution for the grace period

! – NGESO will procure up to 300MW of ‘non-visible’ DC i.e. without real-time operational metering

non-BM
- Record data each second
- Store in provider’s own systems, send to NGESO at end of contract period

Six months after go-live all non-BM providers must meet one of the two enduring solutions above to participate in Dynamic Containment

Requirement:
- Active power each second
- Availability
Baselines

Enduring provider routes:

BMU
- Use existing BM systems

non-BM
- Submit via t.b.c solution (likely a Data Concentrator development)

If non-BM is not connected to Data Concentrator:
- NGESO will allow use of the alternative solution for the grace period

non-BM
- Create and record a baseline in-line with PN rules
- Store in provider’s own systems, send to NGESO at end of contract period

Six months after go-live all non-BM providers must meet one of the two enduring solutions above to participate in Dynamic Containment

Requirement:
Submit baseline in-line with physical notification rules
Performance metering

**Enduring provider routes:**

- **BMU**
  - Record at 20Hz
  - Store for 3 months
  - Provide data to NGESO on request at 3 day notice

- **non-BM**
  - Record at 20Hz
  - Store for 3 months
  - Provide data to NGESO on request at 3 day notice

If a provider cannot meet the 20Hz requirements:
- NGESO will allow use of the alternative solution for the grace period

**All providers**
- Record, store & provide data at 10Hz

**Six months after go-live** all providers must be able to meet the 20Hz requirement to participate in Dynamic Containment

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Requirement: Provide NGESO with performance data at 20Hz granularity

- We may use interpolation on 10Hz data to assess performance.
- Any resulting underperformance is the responsibility of the provider.
## Service rules: summary so far

<table>
<thead>
<tr>
<th>Service area</th>
<th>Options at soft launch</th>
<th>Conditions</th>
</tr>
</thead>
</table>
| **Operational metering** | BMU: submit data via existing BM route  
Non-BM: submit data via Data Concentrator                                                                  | Non-BM providers have six months from go-live to connect to Data Concentrator                         |
| **Baselines**       | BMU: submit data via existing BM route (FPNs)  
Non-BM: submit data via new NGESO systems                                                                  | From go-live of the new IS solution non-BM providers have six months to connect                      |
| **Performance metering** | Data to be provided at 10Hz or 20Hz                                                                     | Six months after go-live all providers must deliver 20Hz data                                          |

! – ESO may limit the quantity of DC procured from providers that are not providing data to an enduring solution (normally BM systems or Data Concentrator)
Aggregation

• Aggregation is permitted at GSP group level. This has changed since our engagement earlier this year.
• NGESO has a better understanding of the benefit-case and market need for aggregation
• We know the control room have a requirement for more precise locational information (e.g. GSP) but we want to explore how best we meet this requirement, in collaboration with industry
• Initially our view was aggregation at GSP only; we have moved to aggregation at GSP group and we are keen to continue the conversation.
State of Energy

• The key principle is that the provider should retain the responsibility to manage their SoE.

• But the ESO should set out:
  • methods by which SoE management is permitted
  • minimum standards – i.e. the minimum energy requirement and the frequency quality standard

• Energy limited providers must follow NGESO’s state of energy rules:
  • Use baselines to manage SoE
  • Conform to the ramp-rate restriction on all baselines
  • No SoE management in the deadband or operational range
  • No penalty to any provider that follows all rules and encounters SoE difficulties
## Service rules: summary

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| Baselines            | BMU: submit data via existing BM route (FPNs)  
Non-BM: submit data via new NGESO systems                                               | From go-live of the new IS solution non-BM providers have six months to connect                                                           |
| Performance metering | Data to be provided at 10Hz or 20Hz                                                    | Six months after go-live all providers must deliver 20Hz data                                                                                 |
| Aggregation          | Aggregation permitted within each GSP group                                              | Further engagement required                                                                                                                 |
| State of energy      | All providers to use baselines to manage SoE in line with supporting NGESO guidance     | Some parameters (e.g. ramp-rate, energy duration) are open to review once we have operational data & experience                              |
Next steps
Engagement

• Publish DC consultation documentation – aiming for Friday 21 August
• We will be at the Ops webinar tomorrow (Weds 19 August)
• We will host a schedule of webinars to take detailed questions on DC in the coming weeks, to support the consultation
Thank you

Contact us:

Via your account manager, or email:

box.futureofbalancingservices@nationalgrideso.com