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# Enhancing Storage in the Balancing Mechanism (BM) – Webinar

12 February 2024

# Welcome & Agenda

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Time	Title	Details
14:30 - 14:40	Welcome and Progress update	Welcome and overview of what has been delivered to date
14:40 – 14:55	Open Balancing Platform (OBP) challenges and utilisation	Overview of the OBP progress and overview of utilisation statistics
14:55 – 15:05	Additional measures to improve dispatch	Overview of additional measures put in place to improve dispatch efficiency
15:05 – 15:25	Q and A	Slido
15:25 – 15:30	Close	Close and Next Steps

**Please note:** This webinar, including the Q&A, will be recorded and published on the ESO website

# Q&A Session via Slido



Please post any questions you have for our speakers on Slido - [#enablingstorage](#) - ensuring to list both your full name and organisation; this will enable us to follow up with you after the event.



All questions posted in Slido will be published online with answers after the event; this will include any questions we are unable to answer in the session due to time constraints or the need for further information.



Out of scope questions will be forwarded on to the appropriate ESO team or expert for a direct response. We may ask you to contact us by email to ensure we have the correct contact details for the response.



Slido will close at the end of the webinar; if you have any further questions, please do not hesitate to get in contact with us at [box.balancingprogramme@nationalgrideso.com](mailto:box.balancingprogramme@nationalgrideso.com)




# Enhancing Storage in the BM – progress to date









Gabriel Diaz, Principal Product Manager

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Original plan – October 23

# Time horizon of activities across 2023



-  - Market reform
-  - Process improvement
-  - System improvement

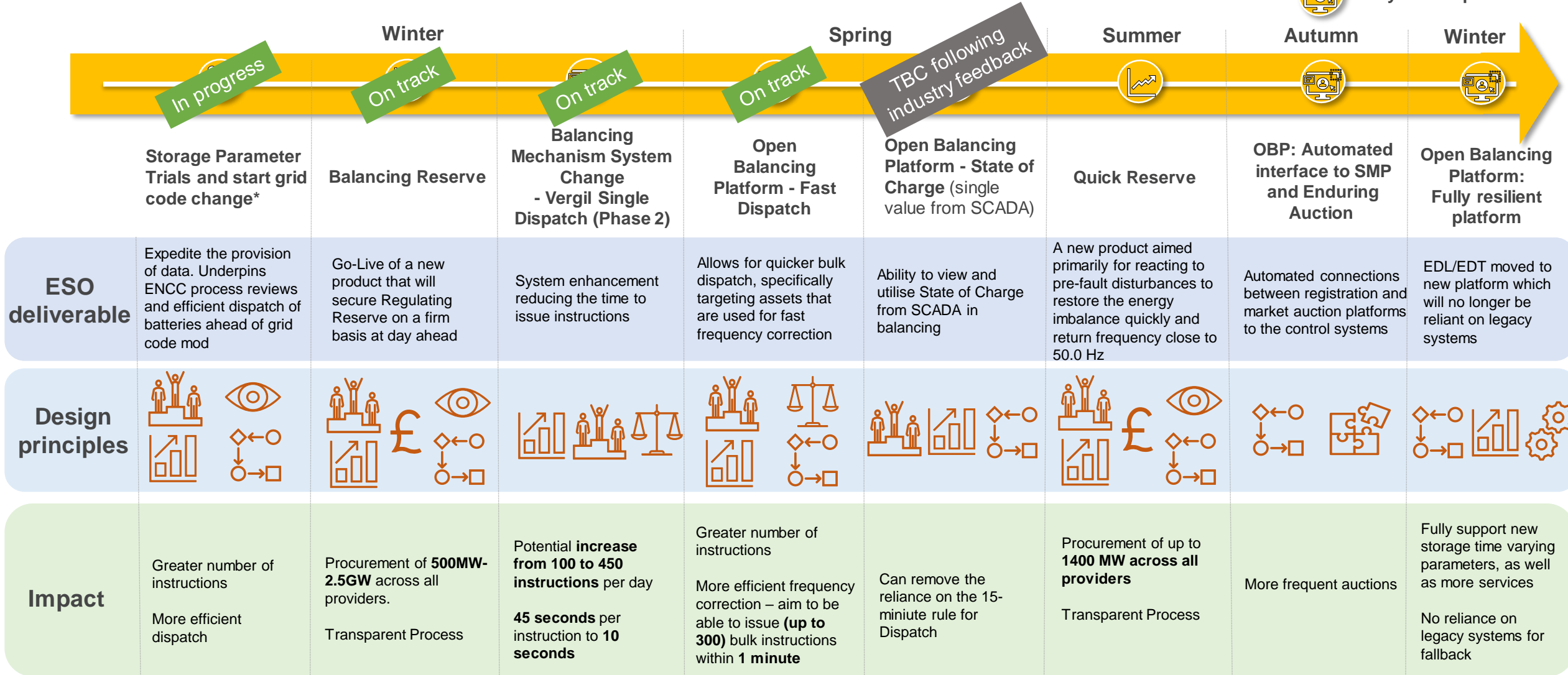
	October			November			December	
	<b>Completed</b>	<b>Completed</b>	<b>Completed</b>	<b>Completed</b>	<b>Completed</b>	<b>Completed</b>	<b>Completed</b>	<b>Phase 1 Completed</b>
	<b>Connections 5 Point Plan – 5: Interim Offer for BESS</b>	<b>Co-optimised and stacking of response services (Auction)</b>	<b>Balancing Mechanism System Change - Vergil Single Dispatch (Phase 1)</b>	<b>Dynamic Regulation: Cap increase</b>	<b>Hackathon</b>	<b>Open Balancing Platform: Release 1</b>	<b>Control room process trials</b>	<b>Dispatch transparency action plan published</b>
<b>ESO deliverable</b>	1st tranche of accelerated storage connections offers <b>10GW from 2026. Non firm up to gate closure</b>	Enabling market providers to tender across the suite of response services	System enhancement reducing the time to issue instructions	Increase cap on current auction to <b>350MW</b>	Machine learning competition to address understand errors in short-term forecasts and understand battery behaviour of charging and discharging	Bulk Dispatch of Battery Zone & Small BMUs	Testing different approaches to the application of storage in meeting reserve requirements through to dispatch decisions.	Publication of dispatch transparency action plan following LCP independent review
<b>Design principles</b>								
<b>Impact</b>	Greater bulk-dispatch capability in terms of total volumes.	Provides flexibility to market providers to simultaneously participate across the response suite of services	Potential increase from <b>100 to 300 instructions per day</b> <b>30 seconds per instruction to 10</b>	Increasing the volume of procured Dynamic regulation	Improved forecasting short term battery behaviour	Consistency in optimisation <b>2-3 instructions per minute to 300 instructions</b> multiple times per hour	Targeted dispatch in real time Potential for more Scheduling Reduced balancing costs	Consistent understanding across industry

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# Time horizon of activities across 2024

-  - Market reform
-  - Process improvement
-  - System improvement



# Time horizon of activities across early 2025

-  - Market reform
-  - Process improvement
-  - System improvement



**Open Balancing Platform:  
Enhanced optimisation**

**Open Balancing Platform:  
BMU/Non-BMU Combined Dispatch**

**Quick Reserve on non-  
BMUs**

**ESO  
deliverable**

Co-optimisation of multiple services in one place

Support for Non-BMU and services into OBP, allowing for treating BMU and Non-BMU equally in terms of co-optimisation and dispatch

Extension of the Quick Reserve service introduced for BMUs in 2024 to Non-BMUs, with co-optimisation and Dispatch via OBP

**Design  
principles**



**Impact**

Automated optimisation across several services, ensuring the most economic actions are taken across differing timescales

Co-optimisation across multiple services as well as BMU and Non-BMU, ensuring equal and most economic treatment of BMU and Non-BMU

Co-optimisation of Quick Reserve for BMUs and Non-BMUs, ensuring equal and most economic treatment of BMU and Non-BMU for Quick Reserve

# Additional items from the original plan

## Workstream 1 – Dispatch Data Transparency

- LCP Delta Skip Rates analysis Phase 2 – *Feb 24*

## Workstream 2 – Enhanced system and process capabilities

- System changes to BM SPICE and margin analysis to enhance Scheduling of Storage – *Completed in Dec 23*
- Updated advice and policy for Scheduling and Dispatch of Storage – *Completed in Jan 24*
- Further OBP training for Control Room – *Ongoing*
- OBP improvements from Control Room feedback – *Ongoing*
- Review dispatching requirements for energy desks in Control Room – *New*

## Workstream 3 – Enable new Energy Storage parameters

- New EDT/EDL guidance for MEL/MIL declarations - *Completed*
- Grid Code change GC0166 – *Ongoing, second workgroup on 7<sup>th</sup> March*

## Workstream 4 – Co-create future capability and market solutions

- Battery Hackathon outcomes – *Feb 24*
- Review of the MFR process – *Ongoing*
- Changes to the 15-min rule - *New*



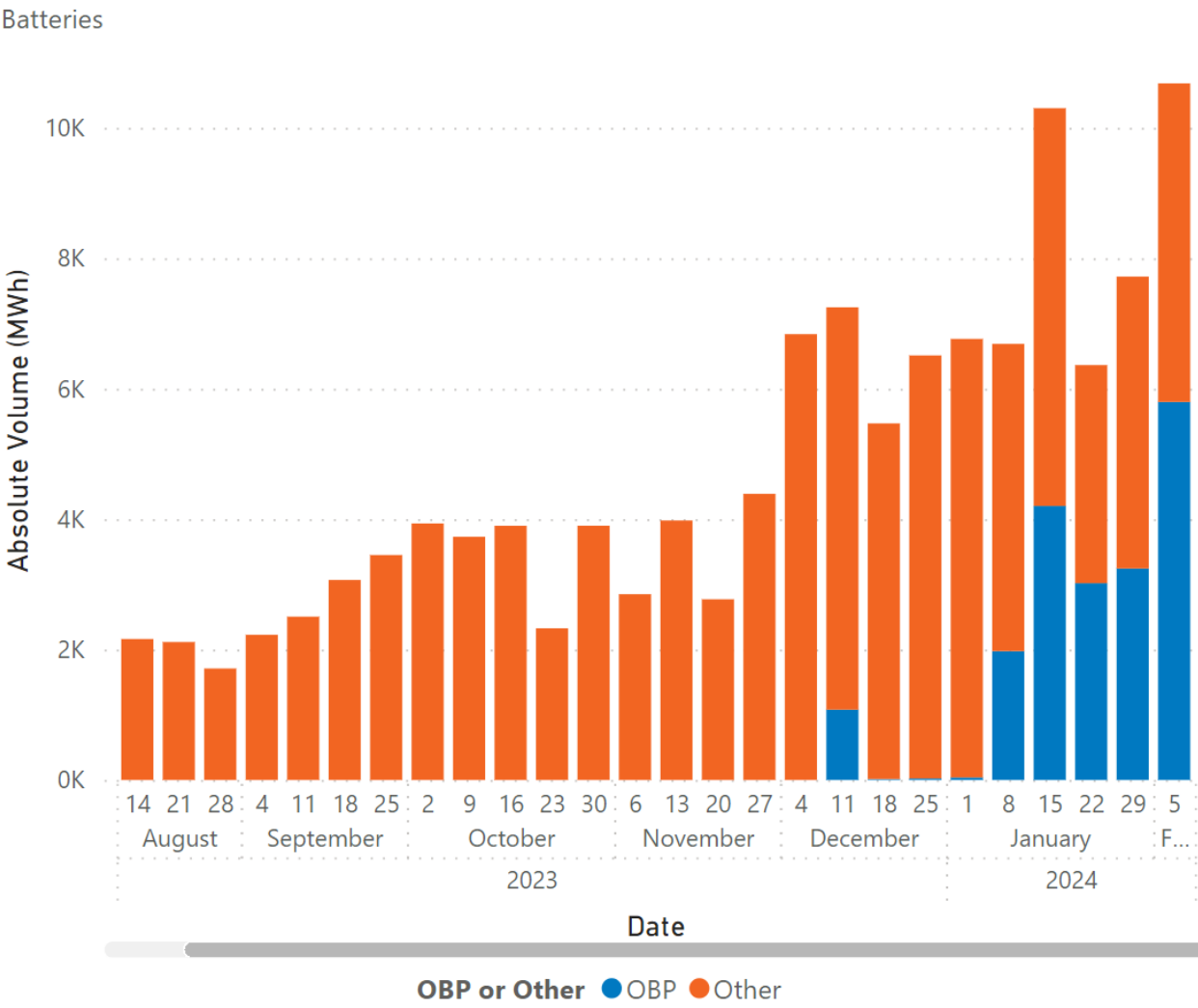
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# Open Balancing Platform (OBP) – challenges and utilisation statistics

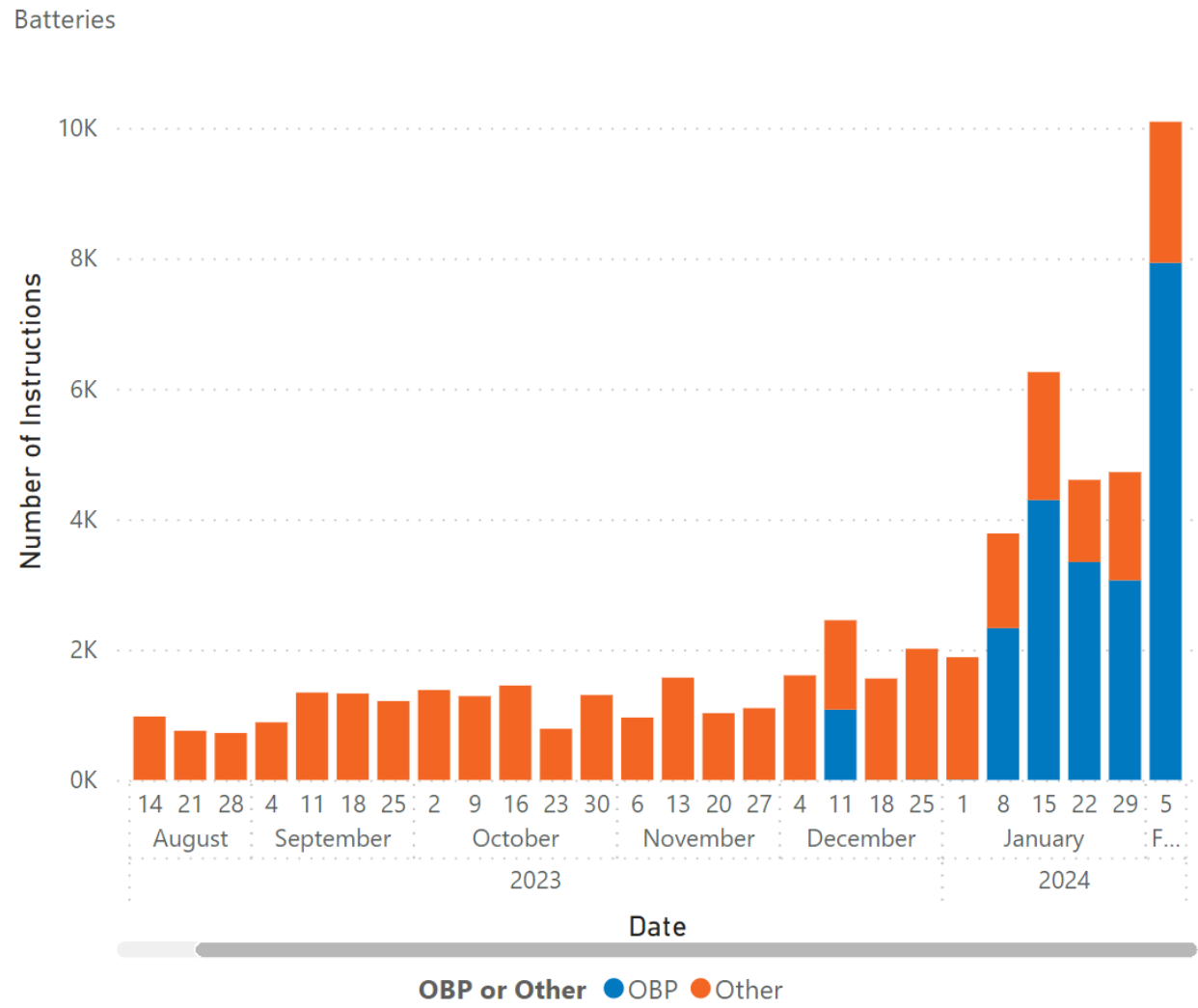
Bernie Dolan, Principal Product Manager

# OBP utilisation statistics – Batteries

Weekly Total Volume (MWh) of Bid/Offer Acceptances



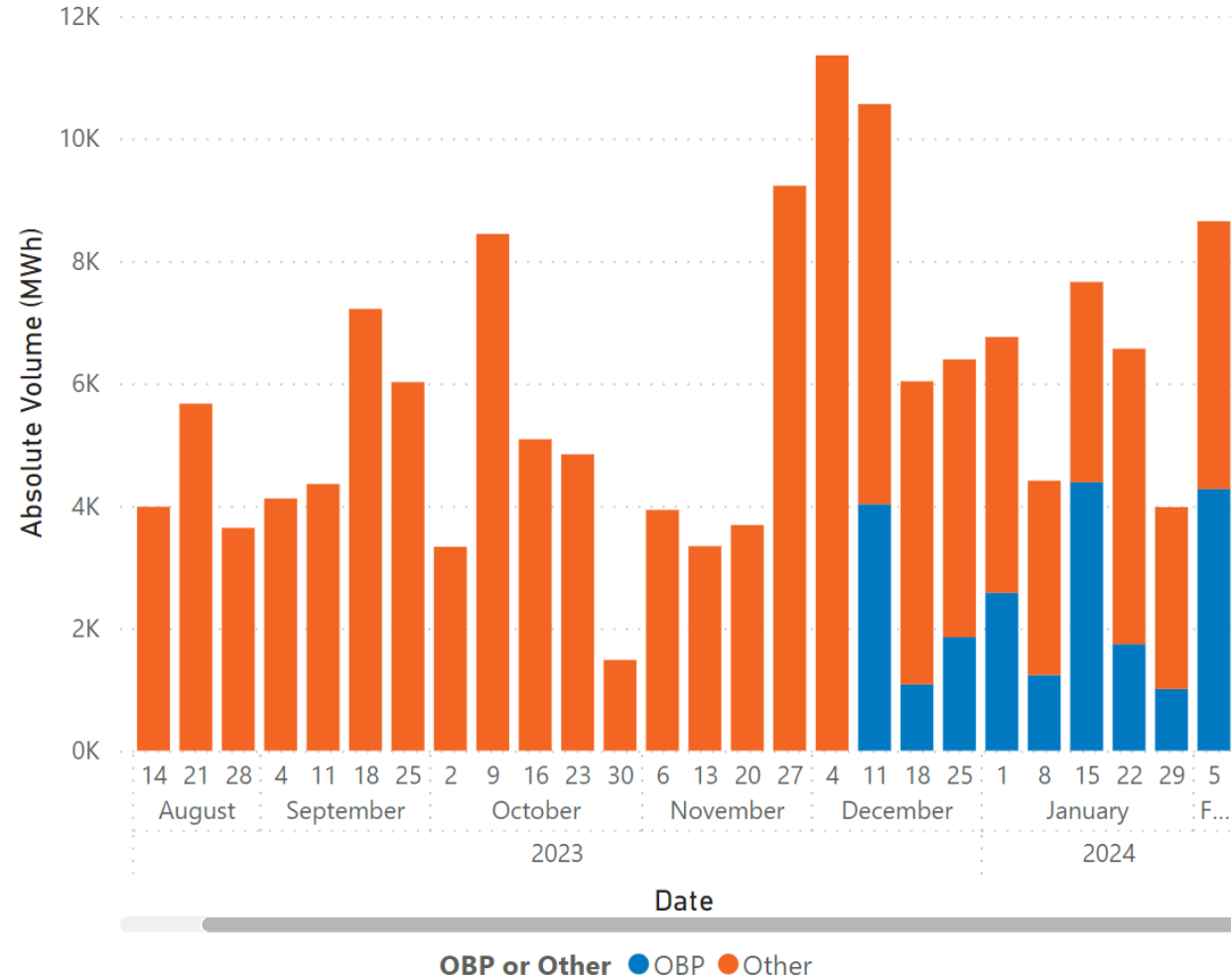
Weekly Total Number of Bid/Offer Acceptances



# OBP utilisation statistics – Small BMUs

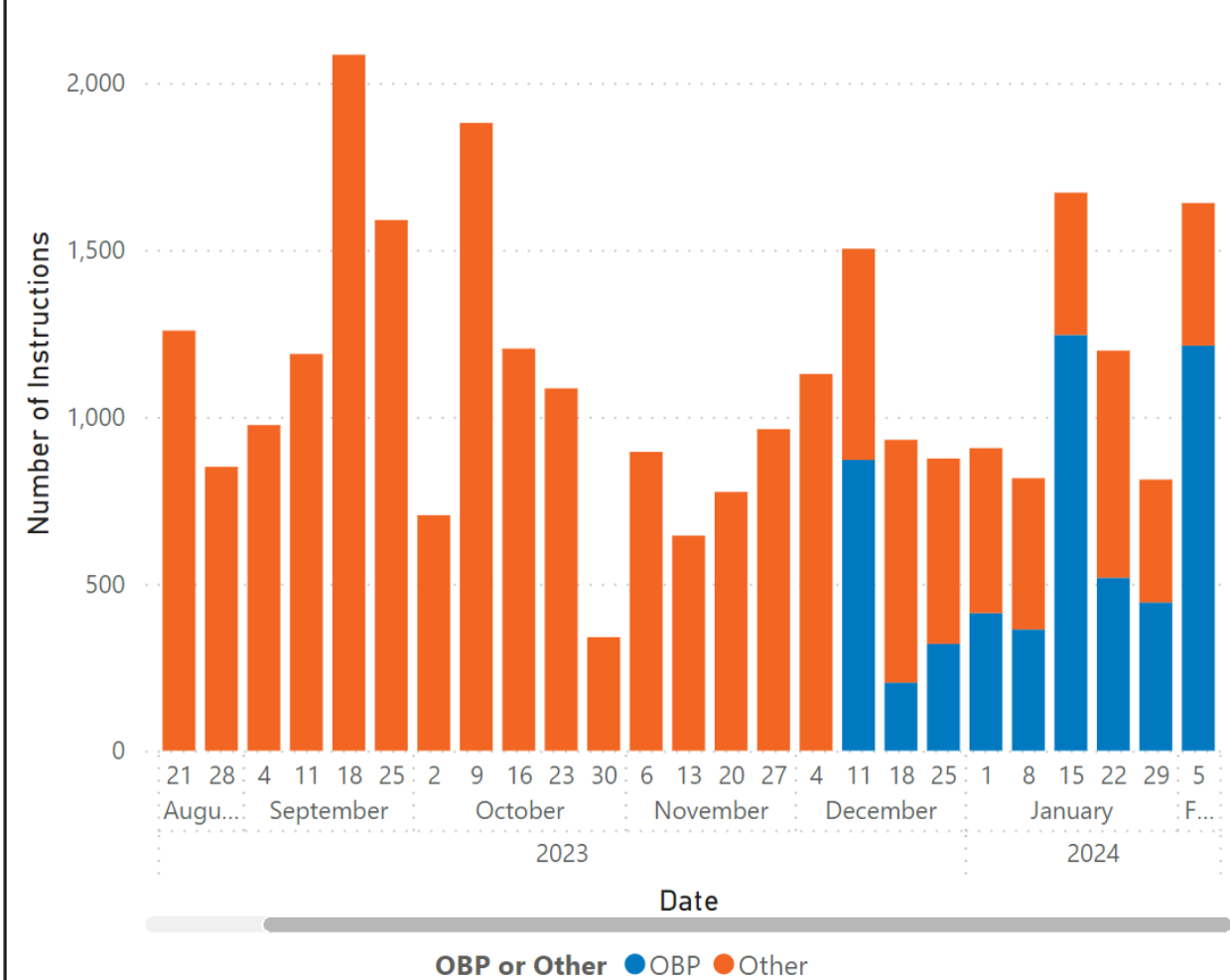
Weekly Total Volume (MWh) of Bid/Offer Acceptances

Small BMUs



Weekly Total Number of Bid/Offer Acceptances

Small BMUs



# Summary of trends for dispatching Batteries and Small BMUs

## Batteries

- OBP has been used continuously for Batteries since 8 Jan 2024
- In this period there has been a steady rise in the number of instructions and volume sent to Batteries

## Small BMUs

- OBP has been used continuously for Small BMUs since 12 Dec 2023
- During this period there have been many days of high wind and warmer than usual days – as a result Small BMUs have not always been in merit
- Due to this, the number of instructions and volume has stayed relatively unchanged for Small BMUs, but it can be observed that OBP is issuing a larger proportion of these instructions

# Details of first release and challenges encountered – Case 1

## Background

- OBP went live on 12 December. On the first day of go-live there were two interconnector trips and OBP was used in anger to dispatch both the Battery and Small BMU zones
- However, despite several months of extensive testing (internal and external) a defect was discovered a few days after go-live
- This defect resulted in a Manifest Error

## Description of Issue

- In the rare case where the optimiser is fast ramping a unit either before or after the settlement period boundary a high-cost BOA could be produced.
- In this instance the user was not given a warning
- Over the Christmas period the use of OBP was suspended for Battery units (which are characterised as having fast ramp rates). Use of OBP was continued for Small BMUs.

## Current Status

- This issue is now resolved - a fix for this defect was implemented on 8 January and after that OBP was used for both Batteries and Small BMUs

# Details of first release and challenges encountered – Case 2

## Background

- A few days after the 8 January release another rare case was encountered
- It was found that certain BOAs were "clipping" high price bands
- This defect has not resulted in any Manifest Errors. The volumes clipped are very small resulting in a low total cost for the BOAs that are created

## Description of Issue

- In this instance it was found that if a unit was to redeclare its MIL or MEL for a period that overlaps another instruction, and the redeclared MIL or MEL is below MW level of the overlapped instruction, in some cases a high-price band is "clipped".
- Users were not warned of this clipping before instructions were sent

## Current Status

- Because the value of using OBP is so high we decided not to suspend the use of OBP while a fix for this defect was developed as the costs were very low by comparison.
- This issue is now resolved and a fix for this defect was released on 6 February

# Details of first release and challenges encountered – Case 3

## Background

- On 31 Jan and 4 Feb, there have been two instances of high-cost instructions being issued. This case is different in nature to the two defects described above
- Two of these BOAs went above the threshold for a Manifest Error

## Description of Issue

- In these cases, control engineers requested a requirement for MWs but the only units that could satisfy this requirement had high prices.
- In this sense the optimiser performed as it was supposed to. However, users were not given an adequate warning that high-cost instructions were in the queue.
- To be clear there were correct warnings produced by OBP, but on subsequent reflection it is clear that the warnings were not adequate

## Current Status

- This issue is now resolved - we have now improved the warning messages for users and these were implemented on 6 Feb.

# Additional Measures to improve dispatch

Ben Young, ENCC Future Design Manager

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# Scheduling and Dispatch Process

## Scheduling

- The scheduling process runs from around 24hrs to 4hrs from real time and is focused on ensuring that we have access to enough energy to meet our margin requirements across these time scales.
- Scheduling plans are regularly updated, as the market moves to resolve the energy position
- Commitment decisions will be taken in scheduling timescales as late as possible, as uncertainty reduces and to allow the market to self balance

## Dispatch

- The dispatch process is closer to real-time and will be making final commitment decisions based on the out-turn of demand and generation
- Dispatch decisions can be broken down into 2 key types:
  - Residual balance of energy following the national demand curve, typically over slightly longer timescales using a range of slower and faster moving assets.
  - Fast frequency correction, reacting to events on the system or short notice energy imbalances

## System Considerations

Throughout both scheduling and dispatch timescales, system requirements will be considered first, including:

- Thermal congestion
- Voltage
- Inertia

# Scheduling and Dispatch Process Improvements

## Scheduling

- From 27 January, we have enhanced the scheduling process to ensure that at all decision points, the capability of batteries are taken into account and considered in line with other options, such as CCGTs and interconnector trading.
- The volume of batteries included in scheduling timescales is established from a probabilistic analysis of the real-time availability as this changes over time.

## Dispatch

- For an initial period of 3 weeks starting on the 5<sup>th</sup> Feb, we have been resourcing an additional balancing engineer in the control room
- The additional resource will be supporting the dispatch of batteries through the OBP platform, across both residual energy balance and fast frequency correction. They will also be investigating changes to our processes to drive improvements to scheduling and dispatch of batteries
- Extending the 15 minute rule, will enhance the use of batteries for residual energy balance
  - Longer BOAs can be issued to batteries for medium term frequency control, which allows them to be considered alongside other dispatch decisions.


# Changes to the 15-minute rule

## Background

- The ESO cannot be sure of the available energy from an energy storage unit
- Currently, the ESO will limit instructions to a maximum of 15 minutes and uses the Maximum Import Limit (MIL) and Maximum Export Limit (MEL) to determine the amount of energy that can be safely dispatched
- After issuing an instruction the ESO waits for a redeclaration of MIL/MEL before issuing another instruction. This rule has a number of shortcomings

## What we propose

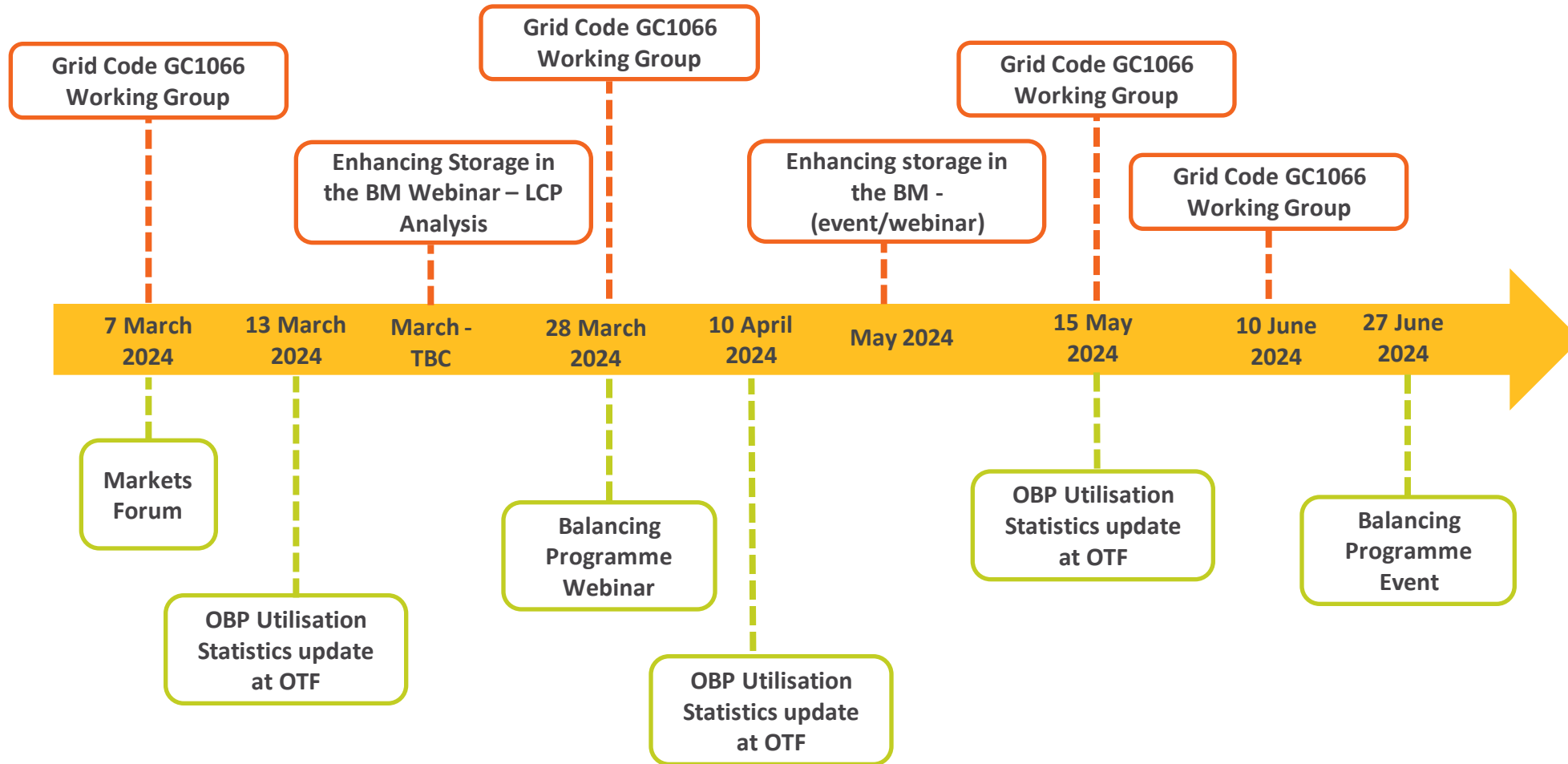
- Following an internal analysis, we will extend this rule to 30 minutes from 1 March 2024
- This will allow energy storage units to be instructed for up to 30 minutes, depending on system conditions. Units must ensure they can sustain their declared available energy for the length of the instruction (up to 30 minutes), this will be monitored as per normal process
- This change will also align with the contracted periods introduced by the new Balancing Reserve service in March
- At this stage, we are seeking for immediate feedback from industry to ensure we can address any potential concerns ahead of the change. Our current guidance will be updated with the new advise
- The new 30-min rule will be in place until new energy storage parameters are in place as part of GC0166

A person with blonde hair, wearing a denim jacket, is dancing with their arms raised at a festival. The background shows a large crowd of people and tents under a sunset sky. The scene is illuminated with purple and pink light trails.

# Q&A

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# Future opportunities to engage



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# Thank you

## Next Steps



We welcome your feedback – please get in touch via the email address below



Slides from today's session will be published on our website, along with the webinar recording



You can reach out to the Balancing Programme team via email – [box.balancingprogramme@nationalgrideso.com](mailto:box.balancingprogramme@nationalgrideso.com)