Public

Balancing Programme Event

24 June 2025

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Housekeeping

Please note we will be taking **photos** throughout the day for use in the NESO newsletter – please let a member of the NESO team know if you don't want to be captured

Fire Exit Procedures

Facilities

Plan for the day

Engage

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Q&A via Slido

Please post any questions you have for our speakers on Slido - **#BPJUNE25** – ensuring to list both your <u>full name and organisation</u>; this will enable us to follow up with you after the event where necessary.

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 NESO 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.

Using Slido, you can also suggest topics for future Balancing Programme engagement events & webinars.

Slido will close at the end of the event; if you have any further questions, please get in contact with us at <u>box.balancingprogramme@neso.energy</u>

Please scan this QR code to participate on Slido or search for Slido online and enter **#BPJUNE25**

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Welcome & Agenda

Time	Agenda Item	Details
9:00 – 9:30	**Registration (refreshments will be provided)**	
9:30 – 9:45	Balancing Programme Overview	• Balancing Programme system transformation overview & value delivered
9:45 – 10:25	Balancing Systems Update	• Delivery progress since March 2025 & associated benefits • 25/26 & 26/27 Open Balancing Platform (OBP) roadmap • Real-Time Predictor on the OBP • OBP digital enablers – Update on the EDL/EDT transition to OBP & NBM activity
10:25 – 10:40	Forecasting Systems Update	• Delivery progress since March 2025 & associated benefits • 25/26 Platform for Energy Forecasting Roadmap
10:40 – 10:55	**Break (refreshments will be provided)– 10:55 move to breakout rooms for 11:00 start**	
11.00 – 11:45	Breakout Session	Participants will rotate across the 3 sessions - you will be allocated a session order on arrival • Improving the management of constraints with OBP inc. Constraint Pathfinders & optimisation • Innovation projects & the Reveal trials platform • OBP demo
11:50 – 12:35	Breakout Session 1, 2, or 3	
12:35 – 13.15	**Lunch (provided) – 13:15 move to breakout rooms for 13:20 start**	
13.20 – 14.05	Breakout Session 1, 2, or 3	
14:10 – 14:55	A Day in the Life of a Control Room Engineer	• Managing the electricity system following the loss of several large generators; session will detail system planning, the role of response & reserve services, and the use of tools inc. OBP in securing the system
14:55 – 15:10	**Break (refreshments will be provided)**	
15:10 – 15:40	Market Services Update	• Update on market products being enabled in OBP for BM & Non-BM units inc. timeline & benefits
15:40 – 15:55	Beyond 2025 Roadmap	• Update on progress to define balancing and forecasting deliverables beyond 2025
15:55 – 16:25	Q&A	• Ask your questions to our panel of SMEs; Slido will remain open throughout the day
16:25 – 16:30	Next Steps & Closing Remarks	• Future engagement opportunities
16:30 – 17:30	**Networking event**	

Balancing Programme Overview

Brendan Lyons, Balancing Programme Director

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System Transformation - Why do we need to Transform?

1. Manage increased number of market participants

2. Quickly adapt to new requirements, innovation and services

3. Enable level playing field for new flexibility services

4. Optimise balancing cost

How are we delivering this transformation?

Current System Changes: Delivering changes and improvements to our current balancing systems, responding to identified need, ahead of OBP being fully implemented in 2027.

Development of New Systems: Developing and delivering two new platforms for balancing and forecasting which are reliable, resilient and secure, and modernise Control Room operations.

Process Improvement: Reviewing current processes to understand what changes and information are required to enhance operation in line with our objectives.

Trials & Innovation Projects: Collaborating on trials & innovation projects to build an understanding of requirements for future balancing capabilities through lessons learned.

Enabling Market reform: Through our system changes and development we enable market reform in response to evolving requirements & need.

System Transformation – Where are we?

Previous landscape

System

Energy Forecasting System (EFS)

Electricity Balancing System (EBS)

Balancing Mechanism (BM)

• SPICE (scheduling)
• SORT (dispatch)
• Vergil (dispatch)
• Demand Predictor
• Clogs (back-up system)

Ancillary Services Dispatch Platform (ASDP)
• Non-BM Response & Reserve services
• MW dispatch

June 2025

System

EFS

Platform for Energy Forecasting (PEF)

BM
• Scheduling
• National Optimisation
• Electronic Dispatch & Logging (EDL) / Electronic Data Transfer (EDT)

Open Balancing Platform (OBP Lite)

• Bulk dispatch
• Interface to Single Markets Platform, Integrated Energy Management System, & Data Analytics Platform (DAP)
• Balancing Reserve
• BM Quick Reserve
• Manual instructions
• Constraint management

ASDP – Non-BM Response & Reserve services / MW dispatch

March 2026

System

PEF

BM
15% of SORT functionality
60% of SPICE functionality

Fully Resilient OBP

85% of SORT functionality
40% of SPICE functionality

Including:
• Constraint Optimisation
• National Optimisation
• EDL/EDT Mastering
• BM & Non-BM response & reserve services
• PEF & NCMS integration
• Network Services
• Enhanced Response & Inertia
• New storage parameters
• Real Time Predictions

March 2027

System

PEF

Fully Resilient OBP

• Modern, resilient, adaptable and scalable system fit for the future

• No differentiation between BM and non-BM units

• Improved situational awareness

• More economic dispatch

• Lower consumer costs

• Reduced CO2 emissions

• Significantly reduced system & market downtime

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Value Delivered by the Programme

Market Participation and Technology Flexibility

Delivered automated instruction creation and send allowing use of smaller flexible assets:

- 36% increase in the number of small BMUs and battery units receiving BM instructions since Oct-Dec 2023.

- 425% increase in battery dispatch volume since OBP R1.

- 31% increase in small BMU dispatch volume since OBP R1.

- 1347% increase in dispatch instructions to batteries.

- 72% increase in dispatch instructions to small BMUs.

Adaptation, Innovation, and Services

- 2000+ OBP updates delivered with minimal downtime.

- Implemented several additional deliverables aimed at improving economic dispatch & transparency.

- Implemented several Control Room improvements inc. bulk dispatch and enhancements to the management of constraints in OBP.

- Facilitated service implementation:
  - Balancing Reserve
  - BM Quick Reserve
  - MW Dispatch

- Implemented a new wind model on the Platform for Energy Forecasting (PEF).

Reduction in CO2 Emissions & Consumer Value

- Carbon intensity decreased from 172 gCO2/kWh (FY21) to 125 gCO2/kWh (FY25), saving 47 gCO2/kWh.

- 2.5% can be attributed to the Balancing Programme providing an estimated carbon saving of £46m in BP2.

- >£600m of consumer savings through improvements in forecasting, dispatch and implementation of market services

You Said, We Did . . .

Activity was needed to address partial dispatch issues in the small BMU zone

We continue to make improvements to the Bulk Dispatch Optimiser (BDO) to address partial dispatch. You can learn more about these improvements in this *recording* from our recent Optimisation Stakeholder Focus Group; slides are accessible *here*.

You asked for transparency around the benefit & impact of the Programme's delivery

We continue to present utilisation statistics for batteries and small BMUs & have expanded our benefit metric reporting to evidence how the programme is contributing to a reduction in CO2 emissions & adapting to new requirements, innovation, & services.

Input into shaping the Programme's future delivery & prioritisation process

We engaged with you via our Stakeholder Focus Groups and Beyond 2025 workstream to generate insights that will guide the development of the NESO Forecasting Strategy and our beyond 2025 roadmap – we will provide an update on progress today.

Improved transparency on how the optimiser in OBP works & further information on National Dispatch Optimisation (NDO)

Our recent Optimisation Stakeholder Focus Group discussed National Dispatch in OBP, its integration into Control Room Processes, and provided insights into the BDOs decision-making – watch the session *here*.
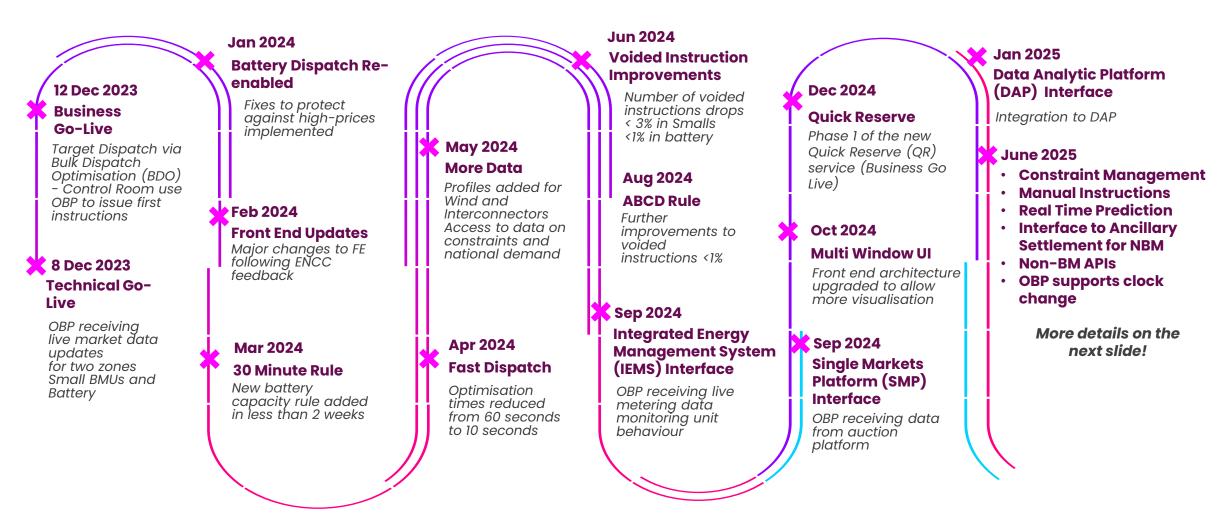
More info on EDL/EDT transition, Constraint deliverables & Control Room Operations

Our Technology Stakeholder Focus Group provided details on EDL/EDT testing requirements and cutover plans – watch *here*; a *guidance note* on the transition has also been shared. Today's event includes further updates on Constraint deliverables, and a session on 'A day in the life of Control Room Engineer' - back by popular demand!

Balancing Systems Update

Bernie Dolan, Principal Product Manager

Sumit Gumber, Product Manager

Nisha Bhamidimarri, Senior Delivery Manager

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Open Balancing Platform (OBP) Key Delivery to Date

12 Dec 2023
Business Go-Live
Target Dispatch via Bulk Dispatch Optimisation (BDO) – Control Room use OBP to issue first instructions

8 Dec 2023
Technical Go-Live
OBP receiving live market data updates for two zones Small BMUs and Battery

Jan 2024
Battery Dispatch Re-enabled
Fixes to protect against high-prices implemented

Feb 2024
Front End Updates
Major changes to FE following ENCC feedback

Mar 2024
30 Minute Rule
New battery capacity rule added in less than 2 weeks

May 2024
More Data
Profiles added for Wind and Interconnectors Access to data on constraints and national demand

Apr 2024
Fast Dispatch
Optimisation times reduced from 60 seconds to 10 seconds

Jun 2024
Voided Instruction Improvements
Number of voided instructions drops < 3% in Smalls <1% in battery

Aug 2024
ABCD Rule
Further improvements to voided instructions <1%

Sep 2024
Integrated Energy Management System (IEMS) Interface
OBP receiving live metering data monitoring unit behaviour

Dec 2024
Quick Reserve
Phase 1 of the new Quick Reserve (QR) service (Business Go Live)

Oct 2024
Multi Window UI
Front end architecture upgraded to allow more visualisation

Sep 2024
Single Markets Platform (SMP) Interface
OBP receiving data from auction platform

Jan 2025
Data Analytic Platform (DAP) Interface
Integration to DAP

June 2025
- **Constraint Management**
- **Manual Instructions**
- **Real Time Prediction**
- **Interface to Ancillary Settlement for NBM**
- **Non-BM APIs**
- **OBP supports clock change**

More details on the next slide!

Continued delivery on BM systems – SORT, SPICE, & VERIGIL – to realise tactical benefits, until an enduring solution is available in OBP.

Deliverables have included activity aimed at improving economic dispatch & transparency e.g., dispatch efficiency monitor

Battery Utilisation Statistics

Absolute Volume (MWh) and Instruction Count by Date

OBP or Non-OBP Energy/System ● Non-OBP Energy Tagged ● Non-OBP System Tagged ● OBP ● OBP Instructions ● Total Instructions

- Enhancements to Legacy Dispatch Algorithm (LDA)
- VERGIL improvements
- Dispatch Efficiency Monitor
- BM Quick Reserve

Enhanced Fast Dispatch introduced for the battery zone

Fast Dispatch introduced for the battery zone

- Battery zone fix
- 30-minute rule for storage assets
- aNBE Battery Role Introduced

Dec 2023 - OBP release 1 – Bulk dispatch in battery & small BMU zone

Comparing 3 months before OBP went live to the latest period - 01 January to 31 March 2025, we observe the average daily volume (MWh) of Batteries in the BM has increased from 632MWh to 4545MWh (618% increase). The average number of daily instructions has increased from 202 to 3675 (1,709% increase).

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Small BMU Utilisation Statistics

Absolute Volume (MWh) and Instruction Count by Date

OBP or Non-OBP Energy/System ● Non-OBP Energy Tagged ● Non-OBP System Tagged ● OBP ● OBP Instructions ● Total Instructions

Comparing 3 months before OBP went live to the latest period - 01 January to 31 March 2025, we observe the average daily volume (MWh) of Small BMUs in the BM has increased from 866MWh to 1430MWh (65% increase). The average number of daily instructions has increased from 178 to 287 (61% increase).

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OBP Roadmap – Upcoming Delivery FY 25/26
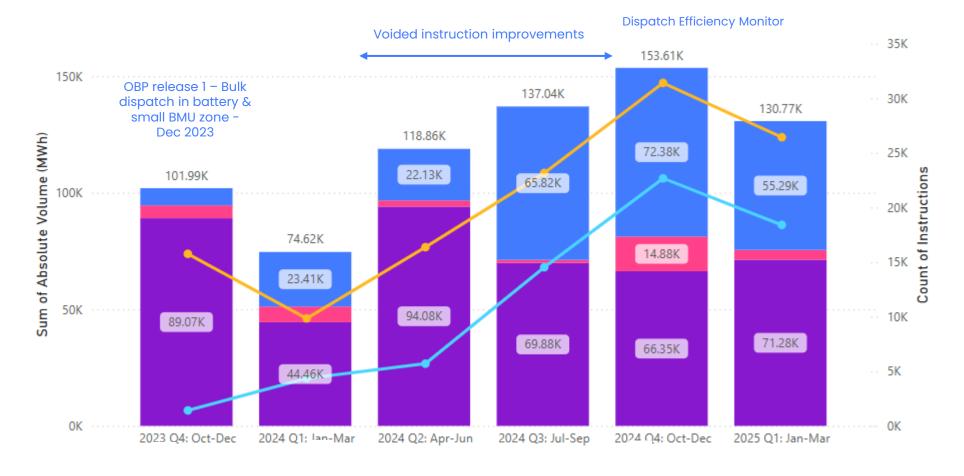
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PI 15 (Jan 25 – Apr 25)

OBP Capabilities:
1. Constraint Management
2. Manual instructions

OBP Enablers:
1. Interface to Ancillary Settlement for NBM
2. Non-BM APIs

PI 17 (Jul 25 – Oct 25)

OBP Capabilities:
1. BM & Non-BM Slow Reserve
2. Move Response (DC/DM/DR)
3. Move MW Dispatch
4. National Optimiser
5. Pumped Storage BOAs
6. Optimisation within a Constraint

OBP Enablers:
1. OBP becomes Operationally Critical
2. Ready to decommission ASDP

PI 19 (Jan 26 – Apr 26)

Capabilities:
1. Interface to NCMS for constraints
2. Response and Inertia

Retire ASDP, VERGIL & CLOGS

PI 16 (Apr 25 – Jul 25)

OBP Capabilities:
1. Non-BM Instruction Types
2. Non-BM Quick Reserve
3. Bulk Dispatch Wind BMUs (rule based)

PI 18 (Oct 25 – Jan26)

OBP Capabilities:
1. Constraints Pathfinder
2. Stability Pathfinder
3. Manage Sync/De-sync

OBP Enablers:
1. EDT/EDL mastered from OBP
2. PEF Integration

Key:
- Complete
- Moved
- **PI:** Programme Increment

Abbreviations: **DC:** Dynamic Containment **DM:** Dynamic Moderation **DR:** Dynamic Regulation **BOA:** Bid Offer Acceptance **DX:** Dynamic Response **VERGIL:** Versatile Graphical Instruction Logger **NCMS:** Network Control Management System **EDL:** Electronic Dispatch & Logging **EDT:** Electronic Data Transfer **ASDP:** Ancillary Services Dispatch Platform **CLOGS:** Contingency Logging System, **API:** Application programming interface, **NBM:** Non-BMU, **BMU:** Balancing Mechanism Unit

Please note – GC0166 implementation date is dependent on the outcome of the Grid Code Modification process

Public

Roadmap Changes

In this period, we have continued to **prioritise the implementation of the new NBM Quick Reserve service**.

Our implementation of NBM QR was started before the completion of industry consultation and **some changes have had to be accommodated** for example, "crossovers" between service periods. In addition, we have built a new highly secure internet gateway due to enhanced NESO security requirements.

Due to this prioritisation there have been **two moves on the roadmap**:

- The National Dispatch Optimiser is now running in test but has not been promoted to production. It is our intention to do this in the next quarter (this is the definition of 'Done').

- The implementation of Pumped Storage is at a stage where control engineers will be able to observe the state of the unit but there is continuing work to send instructions that change these states. This should also be promoted in the next quarter.

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Major Milestones and Expected Impacts

Delivered **automated instruction creation** and send allowing use of smaller flexible assets

Implemented **new optimisers** in the battery and small BMU zones reducing time for control engineers to make economic choice

Major **increase in the number of instructions** sent to batteries and small BMUs

Enhanced **support for constraint management** improving balancing costs

Implementation of Market Services – BM Balancing Reserve and Quick Reserve

PI16 – implement NBM version of **Quick Reserve** and provide **new industry APIs** supporting customers

PI17 – Provide **optimisation tools** to **solve a constraint** reducing balancing costs and ensuring units are not overly restricted

PI17 – new **national optimiser** with better **wind modelling** reducing balancing costs

PI17 - implement BM and NBM **new Slow Reserve** product delivering consumer benefits and **new opportunities** for flexible assets

PI17 - deliver a **2nd Data Centre** providing enhanced resilience to OBP and **reducing sub-optimal market operation** during downtime

PI17 - **combine management of BMU and NBM response** on OBP reducing balancing costs through joint monitoring

PI17 - deliver new **real-time predictors** to the control room improving dispatch decisions

PI18 - improve **dispatch of Wind** by interfacing to new forecasting tools and choosing best profiles

PI18 - implement Grid Code change **GC0166** for batteries **improving scheduling** decisions

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Key: **PI 16: Apr 25 – Jul 25**, **PI 17: Jul 25 – Oct 25**, **PI 18: Oct 25 – Jan26**

OBP Draft Roadmap FY 26/27

In 2023 we consulted with Industry on our future roadmap – this was the position we agreed for FY26/27 – this will be reviewed within our Beyond 2025 workstream

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PI 20 (Apr 26 – Jul 26)

OBP Capabilities:
1. Reserve (up/down) margins
2. Provide Data to Elexon (SAA/BMRA)

PI 22 (Oct 26 – Jan 27)

OBP Capabilities:
1. Replace Zones with Responsibility Groups

Retire BM

PI 21 (Jul 26 – Oct 26)

OBP Capabilities:
1. Optimisation in Scheduling timescales
2. Enhanced interconnector Management

PI 23 (Jan 27 – Apr 27)

OBP Capabilities
1. Co-optimisation near real-time
2. Pathfinder integration

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FY26/27 - What does it Mean?

OBP Roadmap	Explanation . . .
Reserve (Up/Down) Margins	Implements functionality that currently exists in SPICE. Future reserve levels are monitored using graphical screens that allow control engineers to manually perform "what-if" scenarios
Provide Data to Elexon	Move this functionality from SPICE to OBP
Optimisation in Scheduling timescales	Builds on "Reserve (Up/Down) Margins" by providing an optimisation tool to manage future reserve levels in scheduling timescales
Enhanced interconnector management	Provides decision support tools that predict changes in interconnector flows
Replace Zones with Responsibility Groups	Move away from current zone structure to responsibility groups that will allow dynamic allocation of work to desks based on workload
Co-optimisation near real-time	Adds reserve and other response services to NDO closer to real-time
Pathfinder integration	Adds pathfinder contracts into decision making tools

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Real-Time Predictor (RTP)

Sumit Gumber

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Real-Time Predictor (RTP)

What is RTP?

- A new modern & modular capability on OBP with four dedicated microservices

- Delivers minute-by-minute national demand predictions and outturns

- Introduces flexible, scalable and advanced algorithms with real-time data to improve dispatch advice

- Future-ready to incorporate new data & machine learning

What does RTP replace?

Our current demand predictor algorithm:

- Designed for a power generation landscape without embedded generation and renewables.

- Uses a complex, inflexible algorithm.
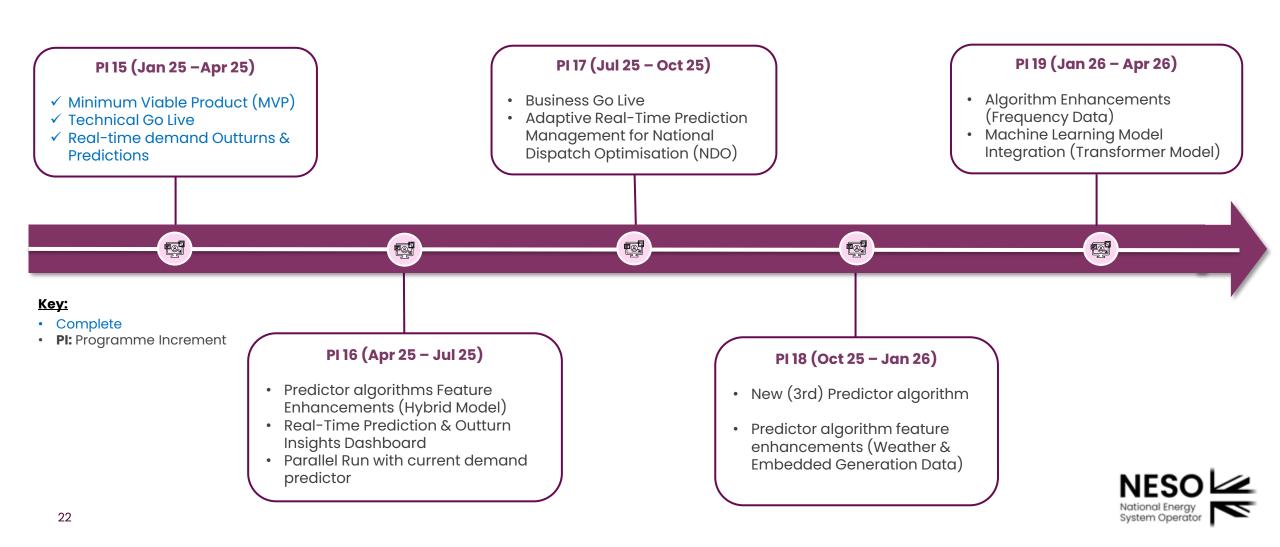
A new demand predictor is essential to ensure scalability and adaptability.

Benefits of RTP?

- To deliver consumer value (~£43m p.a.) through improved accuracy, process and user efficiency.

- Streamlined processes reduce repetitive manual data input and calculation efforts, leading to increased operational efficiency, and allowing more focus on strategic decisions to support dispatch improvements.

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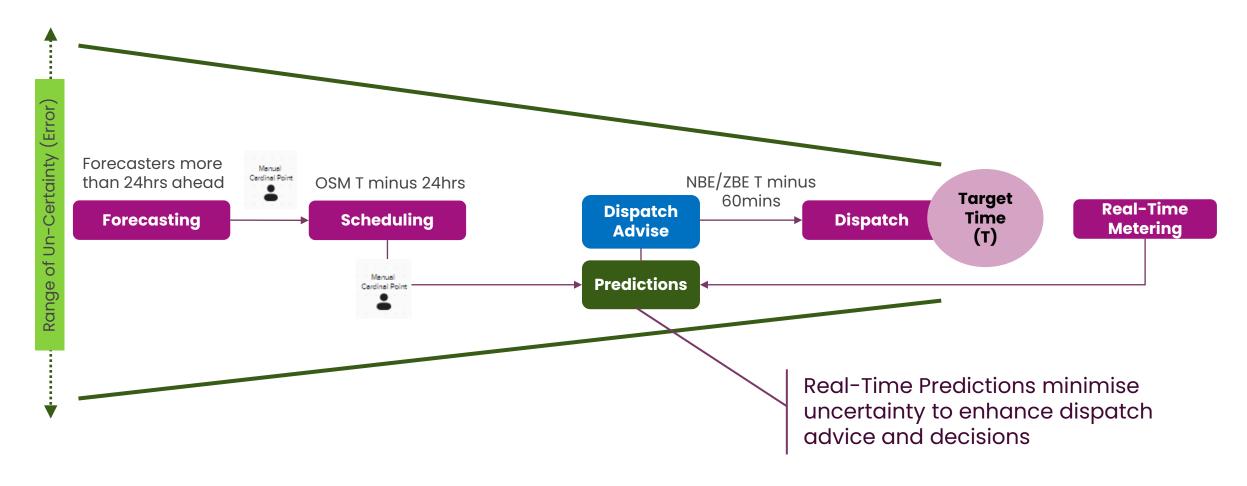
Real-Time Predictor Roadmap

What have we delivered & what is coming next?

PI 15 (Jan 25 – Apr 25)

✓ Minimum Viable Product (MVP)
✓ Technical Go Live
✓ Real-time demand Outturns & Predictions

PI 17 (Jul 25 – Oct 25)

• Business Go Live
• Adaptive Real-Time Prediction Management for National Dispatch Optimisation (NDO)

PI 19 (Jan 26 – Apr 26)

• Algorithm Enhancements (Frequency Data)
• Machine Learning Model Integration (Transformer Model)

Key:
• Complete
• **PI:** Programme Increment

PI 16 (Apr 25 – Jul 25)

• Predictor algorithms Feature Enhancements (Hybrid Model)
• Real-Time Prediction & Outturn Insights Dashboard
• Parallel Run with current demand predictor

PI 18 (Oct 25 – Jan 26)

• New (3rd) Predictor algorithm

• Predictor algorithm feature enhancements (Weather & Embedded Generation Data)

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Real-Time Predictor Value Stream

Range of Un-Certainty (Error)

Forecasters more than 24hrs ahead

Manual Cardinal Point

OSM T minus 24hrs

Forecasting

Scheduling

Manual Cardinal Point

NBE/ZBE T minus 60mins

Dispatch Advise

Dispatch

Target Time (T)

Real-Time Metering

Predictions

Real-Time Predictions minimise uncertainty to enhance dispatch advice and decisions

Abbreviations:
- **NBE:** National Balancing Engineer
- **ZBE:** Zonal Balancing Engineer
- **OSM:** Operational Strategy Manager

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Real-Time Predictions Journey

Live Metering	Real-Time predictions	Improved Situational Awareness	Improved Prediction for National Dispatch Optimiser (NDO)	Consumer Value
NOW : Real-time operational metering (every 10s) from integrated energy management systems (IEMS) **FUTURE:** Frequency Data every second	**NOW**: Two Algorithms trained on live metering data **FUTURE:** Three Algorithms, re-trained regularly for new features and new data	**NOW**: Real-time predictor dashboard using OBP design system **FUTURE** : Enhanced user experience with an adaptive insights dashboard featuring real-time performance metrics for each algorithm	**NOW**: Parallel run with current demand predictor to validate the new algorithms **FUTURE** : User will be able to select best-performing algorithm for NDO	Real-Time Prediction improvements and enhanced situation awareness are expected to **improve dispatch advice and decisions**, potentially delivering an **estimated £43 million per annum** in savings on balancing costs
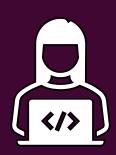
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Digital Enabler Update

Nisha Bhamidimarri

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EDT / EDL Transition

Abbreviations:
- **EDL:** Electronic Dispatch & Logging
- **EDT:** Electronic Data Transfer
- **WA API:** Wider Access API

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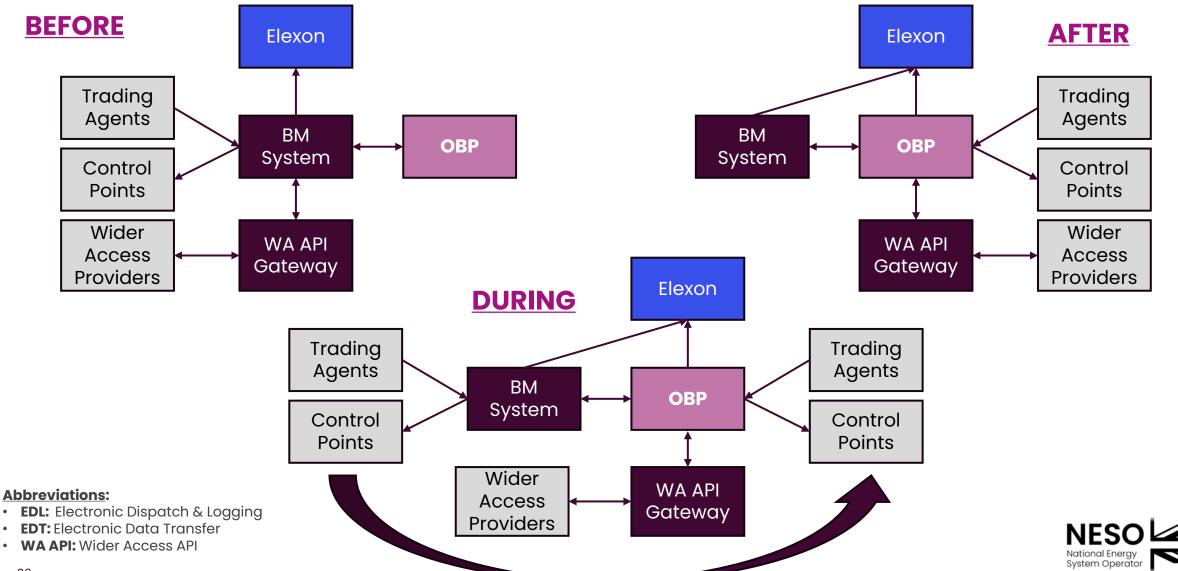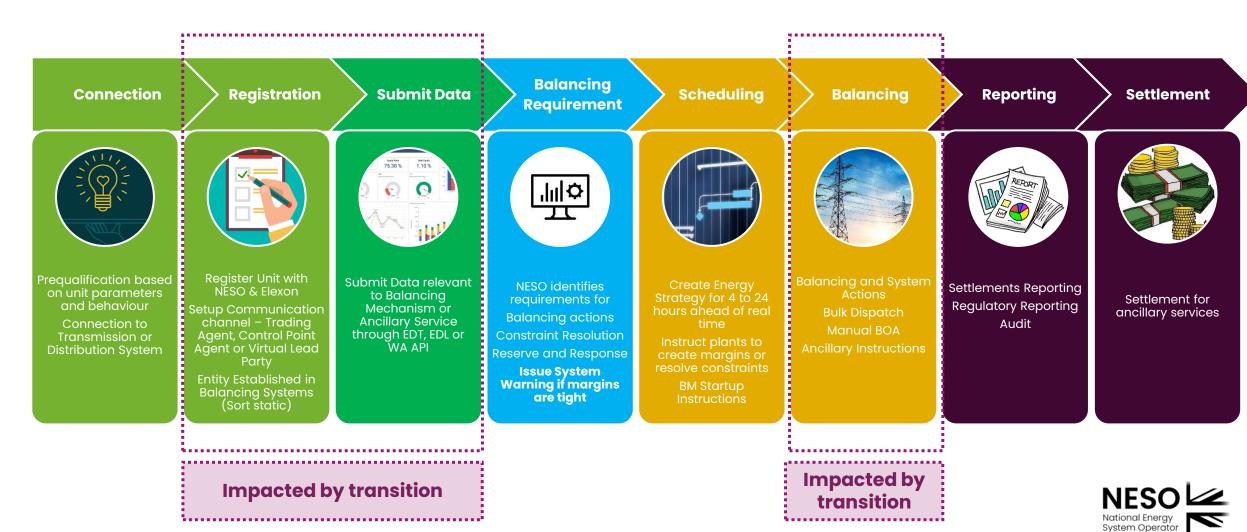
Market Participant Journey – Balancing Mechanism Unit

Connection	Registration	Submit Data	Balancing Requirement	Scheduling	Balancing	Reporting	Settlement
Prequalification based on unit parameters and behaviour

Connection to Transmission or Distribution System | Register Unit with NESO & Elexon

Setup Communication channel – Trading Agent, Control Point Agent or Virtual Lead Party

Entity Established in Balancing Systems (Sort static) | Submit Data relevant to Balancing Mechanism or Ancillary Service through EDT, EDL or WA API | NESO identifies requirements for Balancing actions

Constraint Resolution

Reserve and Response

Issue System Warning if margins are tight | Create Energy Strategy for 4 to 24 hours ahead of real time

Instruct plants to create margins or resolve constraints

BM Startup Instructions | Balancing and System Actions

Bulk Dispatch

Manual BOA

Ancillary Instructions | Settlements Reporting

Regulatory Reporting

Audit | Settlement for ancillary services |

Impacted by transition

Impacted by transition

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Impact on Software Vendors & Market Participants

EDT Changes:

- A new Fully Qualified Domain Name (FQDN)
- A different DNS server
- New IP addresses to be whitelisted
- A new security protocol for file transfer – FTPS; will no longer support FTP
- Updated credentials for login to new system

EDL Changes:

- Connection established from a different IP address compared to BM
- Same pool of IP addresses as EDT - may be a different IP address
- Change in pattern of outage

Guidance Document & Webinar:
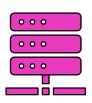
- Details on transition phases
- Impact on Software Vendors and Market Participants
- Overview of testing Requirements

Access the Guide for Market Participants **here** & catch-up on the webinar **here**.

Public

BM to OBP EDT / EDL Transition

Guide for Market Participants
V1.0, May 2025

Public

Technology Stakeholder Focus Group

EDT/EDL Transition to Open Balancing Platform

28 April 2025

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EDT/EDL Transition Update

Where are we?

- Network design shaped

- Delivery work in progress

- Engaged with software providers & market participants re: readiness testing for the transition - We now have EDT / EDL contact details for just over 80% of BMUs.

Wider Access API (WAAPI)
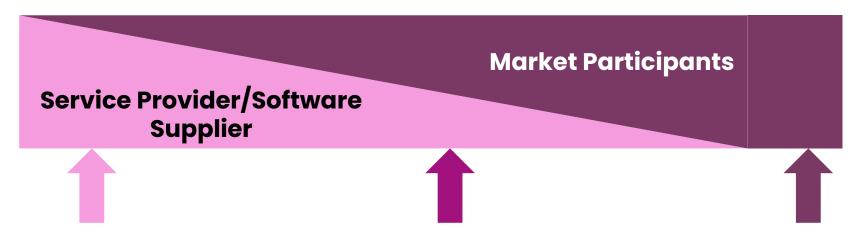
WAAPI providers will **not be migrated** however the system will be repointed to connect to OBP.

There will be a short outage to repoint the network connectivity. This will be towards the end of the transition.

What next?

- Further communication & engagement
  - Follow-up with organisations we are yet to hear from re: EDT/EDL contact details (Jun – Jul 25)
  - Drop-in sessions / meetings with technical teams for MPs & SPs re: testing & transition (Jul – Aug 25)
- Internal pilot and Shadowing between BM & OBP by Jul 25
- Market Participant Environment readiness by Aug 25
- Market Participant & Software Supplier testing (Aug – Oct 25) – more details on the next slide!

Type of Testing with NESO

Market Participants

Service Provider/Software Supplier

Managed Service Provider
- Software testing (Type Testing inc. behavioural test)
- Connectivity Testing (NAT)
- E2E Business Process Testing for each BMU (BPIT)

Market Participant
- BMU Data inc. behavioural test

Software Service Provider
- Software Testing (Type testing inc. behavioural test)

Market Participant
- Connectivity Testing (NAT)
- E2E Business Process Testing for each BMU(BPIT)
- BMU Data inc. behavioural test

Market Participant
- Software Testing (Type Testing inc. behavioural test)
- Connectivity Testing (NAT)
- E2E Business Process Testing for each BMU (BPIT)

All tests for each hosting provider for select participants

Type Test for each software NAT and BPIT for each provider

All tests for each provider

EDT/EDL plan on a page

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NESO and Market
Moved

Tasks	2025									
	M	A	M	J	J	A	S	O	N	D
Milestones										
Build EDT/EDL Adapters										
Ready OBP Infrastructure and Network										
Software Validation in Dev/QA										
OBP/BM Transition testing & dress rehearsal										
Software Type Testing										
BPIT Testing										
NAT Testing										
Transition										

Milestones:
- OBP Software proven
- MPT Environment available
- OBP and BM Ready for transition
- Phase 1 transition complete

EDT/EDL Transition

Start of Transition

BM Release to start transition

Planned Outage to market

Phased Approach

Each week we will transition TA & CP in tranches

It will be Tuesday and Thursday

There will be a short outage for the TA & CP doing the transition

Transition Complete

All TA & CPs transitioned from BM to OBP for EDL/EDT communications.

OBP is designed and operated as a continuously available system therefore participants will benefit from reduced planned outages of EDT/EDL

Transition to take place within **6-week window between October '25 and December '25** to avoid registration delays & ensure continuity of operations.

New EDT/EDL connections or new BMUs will not be able to join the production systems during this period.

NBM Dynamic Response & Slow Reserve Webinar

Date: 31.07.25
Time: 11:00 – 12:30
Location: Microsoft Teams

Sign-up Link: *Technology Stakeholder Focus Group*

Previous sessions covered the general NBM migration but were focused on NBM Quick Reserve – you can watch the session **here** & access the slide content **here**.

This session will cover NBM Dynamic Response migration, and the new NBM Slow Reserve service – including timelines.

Balancing Programme Stakeholder Focus Groups (2025/6)

Scan me or use the link above to sign-up

NBM & OBP – Current Status

- **Quick Reserve** – Ongoing tracking for July Go Live.

- **Slow Reserve** – The EBR Article 18 industry consultation for Slow Reserve is currently live. NBM Slow Reserve is progressing in OBP with a target for September 2025 readiness.

- **Dynamic Response** – Building to migrate from separate BM and ASDP systems onto a single OBP platform.
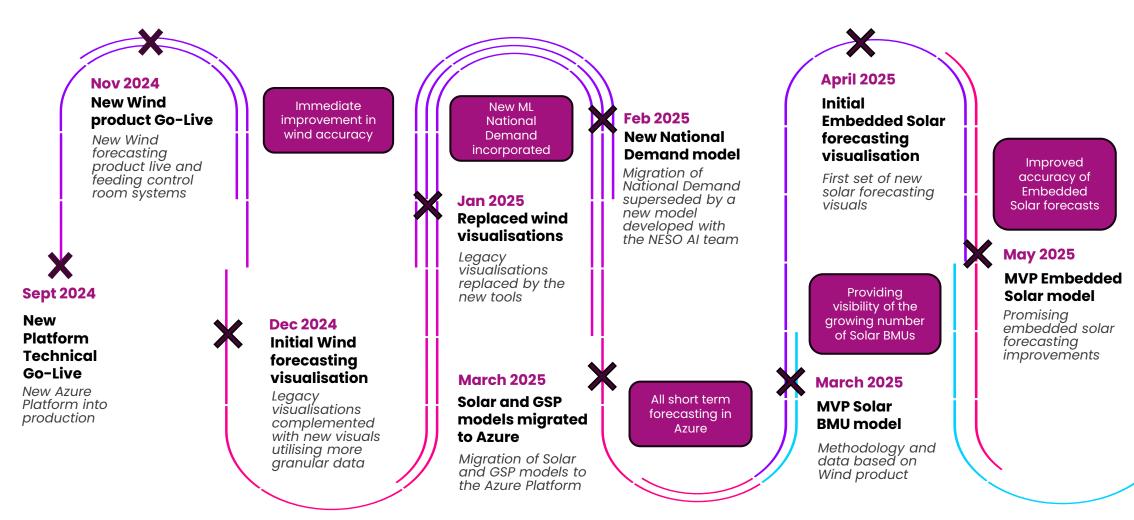
Integration and Migration to OBP

- NBM API v4 has been updated for NESO branding, the new Reserve services, and applies for NBM Quick Reserve, Slow Reserve and Dynamic Response.

- Integration will be via the new NESO data centre

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Forecasting Progress Update

Richard Sykes, Product Manager

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A Recent History of the Platform for Energy Forecasting (PEF)

Nov 2024
New Wind product Go-Live
New Wind forecasting product live and feeding control room systems

Immediate improvement in wind accuracy

New ML National Demand incorporated

Feb 2025
New National Demand model
Migration of National Demand superseded by a new model developed with the NESO AI team

April 2025
Initial Embedded Solar forecasting visualisation
First set of new solar forecasting visuals

Improved accuracy of Embedded Solar forecasts

Jan 2025
Replaced wind visualisations
Legacy visualisations replaced by the new tools

Sept 2024
New Platform Technical Go-Live
New Azure Platform into production

Dec 2024
Initial Wind forecasting visualisation
Legacy visualisations complemented with new visuals utilising more granular data

March 2025
Solar and GSP models migrated to Azure
Migration of Solar and GSP models to the Azure Platform

All short term forecasting in Azure

Providing visibility of the growing number of Solar BMUs

March 2025
MVP Solar BMU model
Methodology and data based on Wind product

May 2025
MVP Embedded Solar model
Promising embedded solar forecasting improvements

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PEF to Deliver More During BP3 (FY25/26)

A focus on Reactive power forecasting supporting processes such as outage planning

+ Improve data for outage planning
+ Reducing balancing actions

Redevelopment of legacy Demand Forecasting Tool

+ Reducing manual activity
+ Better visualisation
+ Reducing human error

Replacement or removal of legacy End-User Developed applications with Azure tools

+ Eliminate reliance on unsupported processes
+ Integration with PEF platform and data

Enhanced control room situational awareness

+ Improved visualisations for better informed decisions

PowerBI and Azure reporting & analytic tools to support future improvements

+ Efficient analysis of forecasts and tools
+ Identifying future improvements through data

Incorporating additional datasets including market and consumer data

+ Increasing the accuracy by incorporating additional data points

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Platform for Energy Forecasting (PEF) Roadmap

Q1 FY 25/26 (Apr 25-Jun 25)

Key Capabilities:
- Visuals and tools for the control room [2]
- Solar BMU model and visualisations [1]
- Improved embedded Solar forecasts [1]
- Integrate Solar Nowcasting [1]
- **Renewable forecast control room situational awareness**

Key Enablers:
- Renewable generation forecasts decoupled from EFS [2]
- GSP model audit [1]
- **Offline Prototype Demand Forecasting capability**

Q3 FY 25/26 (Oct 25-Dec 25)

Key Capabilities:
- Azure produces long term forecasts (demand) [2]
- **Demand forecasting control room situational awareness**

Key Enablers:
- Integration with Network Access Planning tools for improved studies [2]
- **MVP Reactive Power Forecasts**

Continuous model improvement

Q4 FY 24/25 (Jan 25-Mar 25)

Key Capabilities:
- ✓ Migration of Solar and GSP [2] products onto the new platform
- ✓ Migration of an enhanced National Demand model onto the new platform. [2]

Key Enablers:
- ✓ MVP Solar BMU model [1]

Q2 FY 25/26 (Jul 25-Sep 25)

Key Capabilities:
- Forecasting tools [2]
- Regional demand forecasts shared with Elexon as part of Electricity System Restoration Standards (ESRS)
- **MVP Demand Forecasting**

Key Enablers:
- PEF migrated to NESO Azure tenancy

Q4 FY 25/26 (Jan 26-March 26)

Key Capabilities:
- Advanced Analytics data integration [2]
- **Improved accuracy for Reactive power forecasting**
- **Redevelopment of Demand Forecasting Tools completed**
- **Replacement or removal of legacy End-User Developed applications (EUDAs) with Azure tools**
- **Enhanced control room situational awareness**
- **PowerBI and Azure reporting and analytic tools to support future improvements**
- **Incorporating additional datasets including market and consumer data**
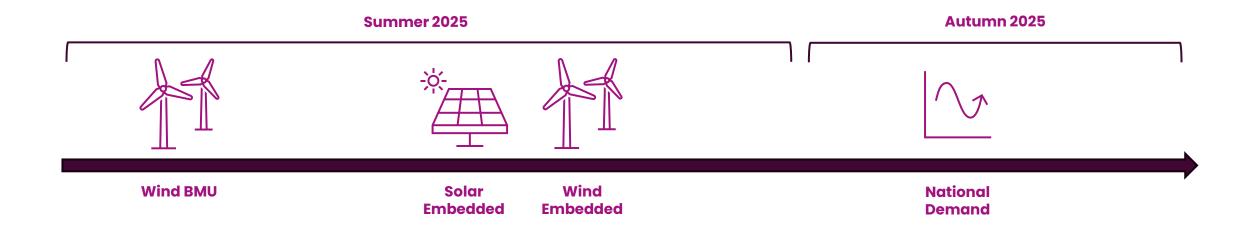
Key Enablers:
- EFS system retirement strategy [2]

- [1] Delivered under "Continuous model improvement",
- [2] Work enabling EFS retirement,
- **Bold** – New BP3
- Complete

Our Decommissioning Progress Increases Data Quality

Bypassing legacy tools from the current process, instead sharing data directly from PEF, improving the quality consumed via Data Portal

Summer 2025   **Autumn 2025**

Wind BMU   **Solar   Wind   National
                               Embedded   Embedded   Demand**

Is there specific forecast data on data portal where an increase in frequency & granularity would be a game changer?

Scan this QR code to participate on Slido or search for Slido online and enter #BPJUNE25

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Development of NESO Forecasting Strategy & PEF Delivery Plan

- Two interactive stakeholder sessions held during May and June 2025

- Feedback on Forecasting needs and the strategy required beyond 2025

What are our forecasting needs? What did you tell us?

Regulatory, Economic, & Natural Environment
- Pan-European Weather and demand impacts on interconnector flows
- Improve access to data and its transparency whilst maintaining the appropriate security as required
- Agreed transparent benchmarking for forecasts and accuracy

Consumer Behaviour & Engagement
- Publication of existing forecasts at the time resolution and timeframe used by the control room is necessary for a unified understanding.
- Developing ways to forecast Data centres and EV charge demand profiles based on historic data and future EV sales growth is needed
- Acquisition and utilisation of DNO data to better inform forecasts

Technological Developments
- Access to behind-the-meter datasets, improving visibility and behaviours
- AI-enhanced weather tracking for improved renewable forecasts
- Storage availability forecasts from EV aggregators and stationary domestic batteries
- Capabilities and opportunities to interact and collaborate with industry on forecasting challenges.
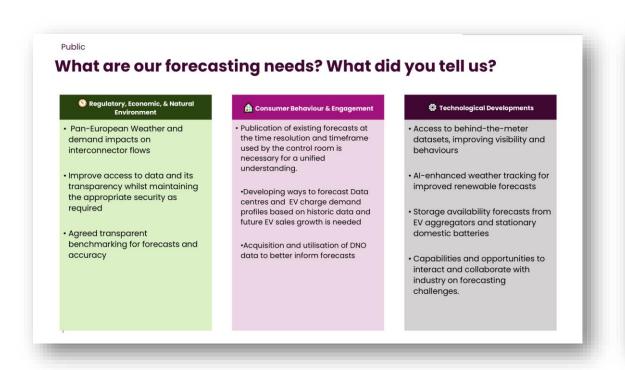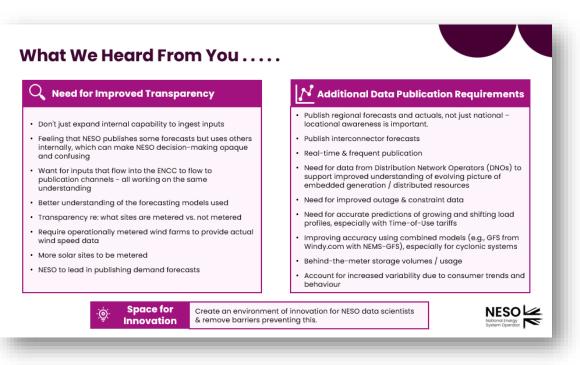
What We Heard From You . . . . .

Need for Improved Transparency
- Don't just expand internal capability to ingest inputs
- Feeling that NESO publishes some forecasts but uses others internally, which can make NESO decision-making opaque and confusing
- Want for inputs that flow into the ENCC to flow to publication channels - all working on the same understanding
- Better understanding of the forecasting models used
- Transparency re: what sites are metered vs. not metered
- Require operationally metered wind farms to provide actual wind speed data
- More solar sites to be metered
- NESO to lead in publishing demand forecasts

Additional Data Publication Requirements
- Publish regional forecasts and actuals, not just national – locational awareness is important.
- Publish interconnector forecasts
- Real-time & frequent publication
- Need for data from Distribution Network Operators (DNOs) to support improved understanding of evolving picture of embedded generation / distributed resources
- Need for improved outage & constraint data
- Need for accurate predictions of growing and shifting load profiles, especially with Time-of-Use tariffs
- Improving accuracy using combined models (e.g., GFS from Windy.com with NEMS-GFS), especially for cyclonic systems
- Behind-the-meter storage volumes / usage
- Account for increased variability due to consumer trends and behaviour

Space for Innovation Create an environment of innovation for NESO data scientists & remove barriers preventing this.

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Recordings of the sessions, slide content, and Industry insights are available here.

Improving the Management of Constraints with OBP

Manos Loukarakis, Optimisation Manager

Ayumu Suzuki, Product Manager

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Optimisation Group Timeline & Feedback

**June 2023
(online)**
◦ Initial kick-off /
group scope
◦ Bulk Dispatch intro

**February 2024
(online)**
◦ BDO details (costs)
◦ Fast Dispatch using
the BDO

**November 2024
(BP engagement event)**
◦ National Dispatch intro
◦ Intro to GC0166 parameters,
group constraints & wind

**Today's session
(BP engagement event)**
◦ Network to group constraints
◦ Constraint management overview
◦ Constraint management – OBP
◦ Pathfinders

**November 2023
(BP engagement event)**
◦ Control processes structure
◦ Bulk Dispatch optimiser
(BDO) details

**June 2024
(BP engagement event)**
◦ Fast Dispatch demo
◦ Instruction algorithm

**June 2025
(online)**
◦ National Dispatch details
◦ Production examples

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NESO's Strategic Approach to Constraint Management

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Legend
- – – IN PROGRESS
- —— EXISTING
- [ ] TOPIC FOR TODAY

Solutions

Other Solutions

Market

Technical

Short-term (now – 2027)

Market:
- Work on **enabling access to our markets** for demand-side flexibility
- **CCP outcome:** continue to develop **Demand for Constraints**
- **CCP outcome:** Focus on existing **short-term CMM for non-BMUs** (e.g., locational/bi-directional DFS)
- **Megawatt Dispatch** enabling flexible Dx connections

Technical:
- **System changes through OBP** to better manage/optimise the use of assets behind a constraint
- Continue with **CMIS expansion, 300MW derogation, operational metering review**
- **Develop our battery storage strategy,** inc. reducing skip rates
- **Outage optimisation,** including Transmission Acceleration
- **CCP outcome: Investigate technical options** relating to Intertrip
- **CCP outcome: Boundary flow smoothing innovation project**

Other Solutions:
- **P462 code mod** would remove distortion of support mechanisms from bids In BM to reduce consumer costs
- **CMP 440 would reinstate locational signal for strategic demand,** incentivising them to site in constrained areas

Medium-term (2028–2030)

Market:
- **Clear route to market** for anything unable to access our core markets
- **BM improvements** to allow more flexibility assets to participate in the BM

Technical:
- **Regional Development Programmes**

Other Solutions:
- **Reformed connections process** prioritising assets which help with operability
- **SSEP and CSNP** to provide strategic direction for system infrastructure and needs

Long-term solutions (2030+)

Market:
- **Wholesale market reform** to reduce the volume and costs of constraints

Technical:
- **Network build-out** to connect more remote generation with demand

OBP Roadmap – Upcoming Delivery FY 25/26

Catch-up on our June 2025 Optimisation Stakeholder Focus Group **here** for more information on the National Optimiser deliverable in PI17

PI 15 (Jan 25 – Apr 25)

OBP Capabilities:
1. **Constraint Management**
2. Manual instructions

OBP Enablers:
1. Interface to Ancillary Settlement for NBM
2. Non-BM APIs

PI 17 (Jul 25 – Oct 25)

OBP Capabilities:
1. BM & Non-BM Slow Reserve
2. Move Response (DC/DM/DR)
3. Move MW Dispatch
4. **National Optimiser**
5. Pumped Storage BOAs
6. **Optimisation within a Constraint**

OBP Enablers:
1. OBP becomes Operationally Critical
2. Ready to decommission ASDP

PI 19 (Jan 26 – Apr 26)

Capabilities:
1. **Interface to NCMS for constraints**
2. Response and Inertia

PI 16 (Apr 25 – Jul 25)

OBP Capabilities:
1. Non-BM Instruction Types
2. Non-BM Quick Reserve
3. Bulk Dispatch Wind BMUs (rule based)

PI 18 (Oct 25 – Jan26)

OBP Capabilities:
1. **Constraints Pathfinder**
2. **Stability Pathfinder**
3. Manage Sync/De-sync

OBP Enablers:
1. EDT/EDL mastered from OBP
2. PEF Integration

Retire ASDP, VERGIL & CLOGS

Key:
- Complete
- Moved
- **PI:** Programme Increment
- **Topics in this session**

Abbreviations: **DC:** Dynamic Containment **DM:** Dynamic Moderation **DR:** Dynamic Regulation **BOA:** Bid Offer Acceptance **DX:** Dynamic Response **VERGIL:** Versatile Graphical Instruction Logger **NCMS:** Network Control Management System **EDL:** Electronic Dispatch & Logging **EDT:** Electronic Data Transfer **ASDP:** Ancillary Services Dispatch Platform **CLOGS:** Contingency Logging System, **API:** Application programing interface, **NBM:** Non-BMU, **BMU:** Balancing Mechanism Unit

Please note – GC0166 implementation date is dependent on the outcome of the Grid Code Modification process****

About Group Constraints

(1) Includes consideration of
... thermal network limits
... voltage stability
... transient stability

Group :: A part of the network, a collection of nodes and associated BMUs

Transfer :: Total power flow out across all boundary circuits in the constraint group

Limit :: The maximum/minimum transfer allowed

Group demand :: The sum of demand across all nodes / Grid Supply Points (GSPs) included in the group

Constraint Group
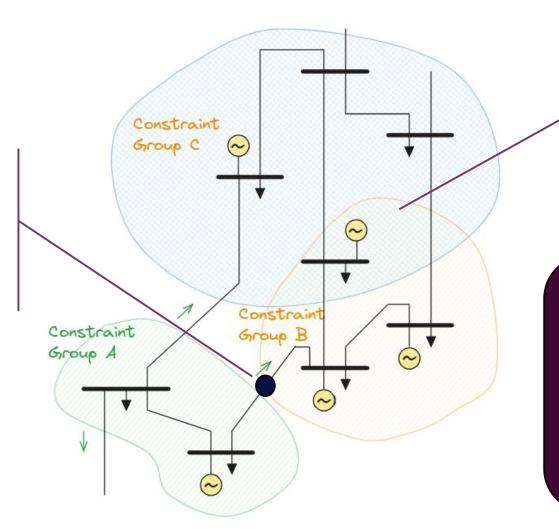
(2) The limit does not necessarily match technical characteristics of any of the underlying network components – it is the total transfer observed when the network is sufficiently loaded for something to "break"

Group Constraints : a simplified model for network constraints (group generation minus demand should be within the transfer limits)

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Complexities Around Group Constraints

(1) Constraint limits are conditional on underlying system state and closely coupled together – e.g., an import limit in one group can be an export limit for another

(2) Units can belong to more than one group constraint – this can complicate the solution

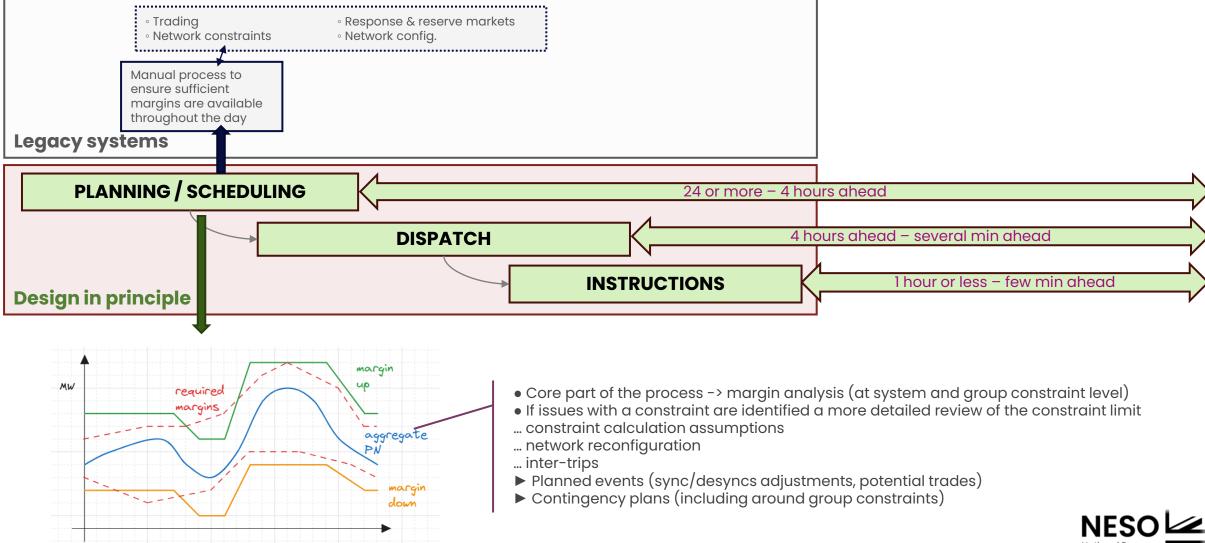**Constraints involve multiple processes**
○ derivation methodology
○ resolving over different time-frames
○ interactions between derivation and resolution processes

… and improvements may be possible across any of the above

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How Constraints Work – Scheduling

Legacy systems

◦ Trading
◦ Network constraints

◦ Response & reserve markets
◦ Network config.

Manual process to ensure sufficient margins are available throughout the day

Design in principle

PLANNING / SCHEDULING

24 or more – 4 hours ahead

DISPATCH

4 hours ahead – several min ahead

INSTRUCTIONS

1 hour or less – few min ahead

● Core part of the process -> margin analysis (at system and group constraint level)
● If issues with a constraint are identified a more detailed review of the constraint limit
… constraint calculation assumptions
… network reconfiguration
… inter-trips
► Planned events (sync/desyncs adjustments, potential trades)
► Contingency plans (including around group constraints)

How Constraints Work – Dispatch

(ROADMAP : National Dispatch, Jul 25 – Oct 25)

Legacy systems

(Legacy Dispatch Adviser - LDA) automated process that indicates a target programme for the system

Design in principle

PLANNING / SCHEDULING

24 or more – 4 hours ahead

DISPATCH

4 hours ahead – several min ahead

INSTRUCTIONS

1 hour or less – few min ahead

national solution

limit

margin

forecasted transfer

30min

- Given planned events, solve energy balancing subject to group constraints
- Solution identifies units which are moved because of constraints
► Issues identified but no instructions directly sent from dispatch solution

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How Constraints Work – Instructions

Legacy systems

Manual process that involves dispatching generation against target programme

Design in principle

PLANNING / SCHEDULING

24 or more – 4 hours ahead

DISPATCH

4 hours ahead – several min ahead

INSTRUCTIONS

1 hour or less – few min ahead

aNBE – 3

NBE

aNBE – 2 ‼

aNBE – 1

● Each aNBE responsible for several group constraints but can dispatch only within specific ZONES
● Coordination between NBE and aNBE required to dispatch across different zones required
● Constraints are resolved first (and tagged as system actions), balancing closer to real time
● Control room engineers will check if any unit before dispatching, breaches a constraint

Abbreviations:
- **aNBE:** Assistant National Balancing Engineer
- **NBE:** National Balancing Engineer

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Constraint Management on OBP

(1) We are not looking to change the process up to dispatch just yet

(2) **KEY ISSUE#1** How we ensure when dispatching for energy balancing (especially in SMALL/BATTERY), that we don't breach a constraint

(3) A simple initial approach was to apply "restrictions" to unit movements if they were within a constraint – but we can do better

Design in principle

PLANNING / SCHEDULING	24 or more – 4 hours ahead
DISPATCH	4 hours ahead – several min ahead
INSTRUCTIONS	1 hour or less – few min ahead

Open Balancing Platform

Scheduling

National Dispatch (ND) Optimisation

Dispatch

Data & UIs

Target Dispatch (TD)

Fast Dispatch (FD)

Manual Instructions

Instructions

(4) **KEY ISSUE#2** How do we efficiently resolve a constraint if immediate action is required close to real time (or dispatch solution is not sufficient)

for future development

in development

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An Improved Restrictions Logic (ISSUE#1)

(ROADMAP: Constraint management, Jan 25 - Apr 25)

(1) 15min intervals are defined (to strike a balance between volume of generated restrictions and accuracy of analysis)

(2) Units within a constraint are selected and ranked according to price

(3) Those with total cumulative Bid Offer Data (BOD) MW below the margin are freely re-dispatched

(4) The ranking is based on the lowest priced BOD for the unit at 15min intervals – manual intervention on restrictions may be occasionally needed
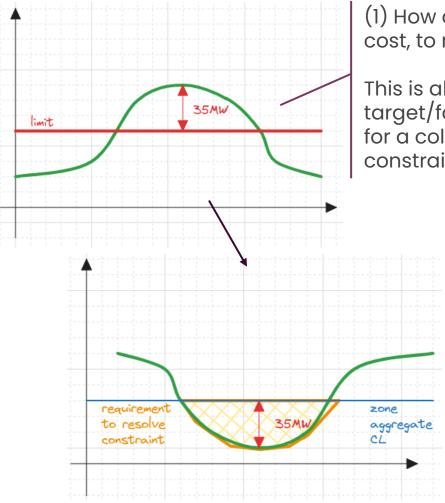
(5) Unit characteristics are not factored in – an unrestricted unit might not have been appropriate to use anyway due to e.g. its minimum up/down times

BMU	£/MWh	MW	Σ(MW)
#5	170	10	50
#4	140	10	40
#3	125	10	30
#2	120	10	20
#1	100	10	10

This initial approach
… enables getting closer to limits,
… reduces workload for control room engineers, allowing for more time to identify best possible solution for balancing.

Resolving a Constraint (ISSUE#2)

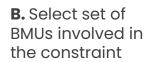## (ROADMAP: Optimisation within a constraint, Jul 25 – Oct 25)

(1) How do we dispatch at least cost, to resolve a constraint?

This is about applying target/fast dispatch (FD/TD) for a collection of units within a constraint
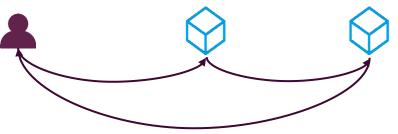
(2) KEY CHALLENGES

○ Problem scale & performance
○ Solving for wind
○ Solving for large BMUs
○ Solving for pumped storage

A. Set requirement against constraint limit/margin

B. Select set of BMUs involved in the constraint

C. FD/TD for solution

D. Process to dispatch according to area of responsibility
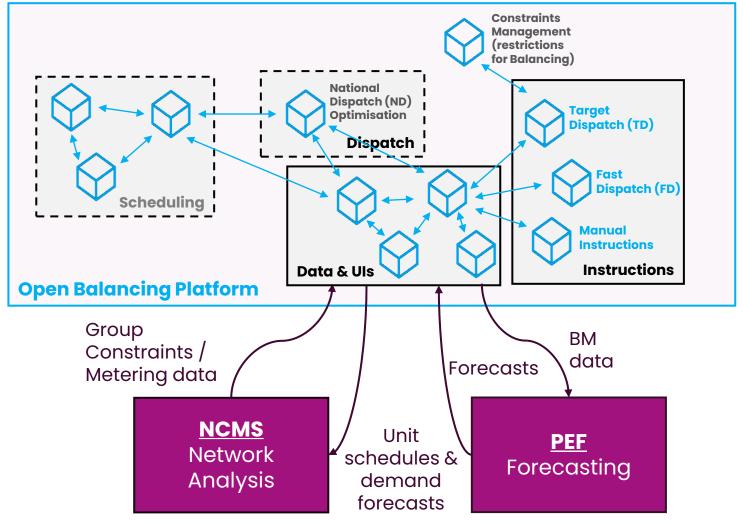
Enabling an automated approach can be expected to:

… reduce costs by utilising more effectively SMALL/BATTERY BMUs for resolving constraints
… while handling more complex unit characteristics,
… and reduce control room workload

Abbreviations:
• **FD:** Fast Dispatch
• **TD:** Target Dispatch

NCMS Interactions

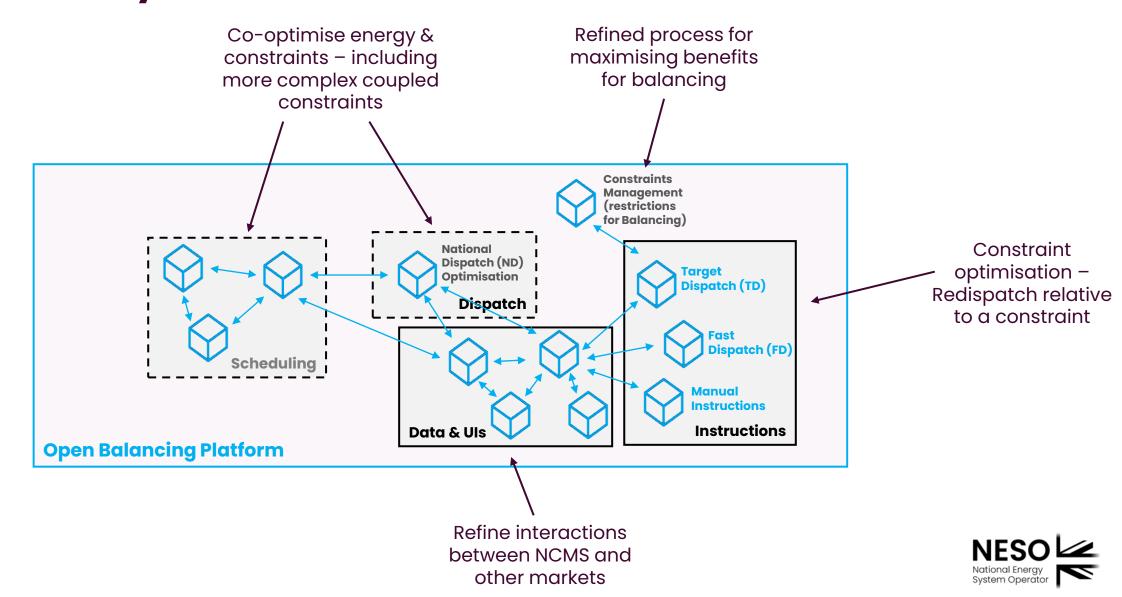**(ROADMAP: Interface to NCMS for constraints, Jan 26 - Apr 26)**

NCMS (Network Control Management System): A new platform for network analysis over time, providing improvements upon our current systems.

Upcoming plans
..1 Initially establish data exchange
..2 refine process around data exchange
..3 improve upon constraints modelling (e.g., using power flow sensitivities)

This integration will leverage capabilities on these new platforms to enable **further automation and dispatch closer to limits.**

In summary…

Co-optimise energy & constraints – including more complex coupled constraints

Refined process for maximising benefits for balancing

Constraints Management (restrictions for Balancing)

Constraint optimisation – Redispatch relative to a constraint

National Dispatch (ND) Optimisation

Dispatch

Target Dispatch (TD)

Fast Dispatch (FD)

Manual Instructions

Scheduling

Data & UIs

Instructions

Open Balancing Platform

Refine interactions between NCMS and other markets

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Context: Network Services (Pathfinder) Schemes

	Constraints	**Stability**	**Voltage**
Helps provide...	Arming for intertrip, to manage constraints	Inertia and short-circuit level	Reactive power, to manage grid voltage
Existing contracts	Since 2022: B6 (Scotland) EC5 Interim (East Anglia)	Since 2021: Phases 1, 2 & 3	Since 2022: Voltage Pennines Voltage Mersey
New contracts	EC5 Enduring (East Anglia, go-live Jul 26)	Y-1 (go-live Oct 25)	Voltage 2026 (first unit go-live Oct 25)

Benefits: Network Services schemes have delivered approximately £324m in savings across BP2 (Apr 23 – Mar 25); for further details click here.

Future: New contracts in pipeline to enable economical & secure operations, and additional market opportunities.

For more information on Network Services Schemes click here

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Enabling Network Services in OBP

(OBP ROADMAP: Constraints & Stability Pathfinder, Oct 25 - Jan26)

Deliverable includes the transition of existing functionality from BM systems to OBP, and additional enhancements.

	Contracts	Decision Making	Constraint limit for National Dispatch Optimiser (NDO)
AS-IS	Low volume, simple payment structure	Independent decision making for each problem	Single fixed MW
TO-BE (Oct 25 – Jan 26 In OBP)	New payment structure (Stability Y-1) • Addition of new 'utilisation fee' - previously only availability fee	Stab. Y-1 & Constraint • Anticipated improvements in contract use • Awareness to support economical decision making	
ASPIRATIONAL	High volume, new contracts	New tools to support new contracts, with holistic approach	Dynamic, depending on network services actions taken

Constraint Management Roadmap

The Balancing Programme will tackle the problem of constraints in phases:

Constraint Management, Jan 25 – Apr 25 (delivered): Moving the process from BM systems to OBP, whilst improving it. Enables management closer to limits and reduce workload for control room engineers.

National Optimisation, Jul 25 – Oct 25: Dispatch advice including constraints in OBP; catch-up on June Optimisation Stakeholder Focus Group slide pack here and recording here.

Optimisation within a Constraint, Jul 25 – Oct 25: Using an optimiser to move units inside a constraint. Reduces costs by utilising small/battery BMUs more effectively and reduces control room workload.

Network Services (Pathfinders), **Oct 25 – Jan 26:** Implement network services schemes to enable economical and secure operations.

Interface to new real-time transmission analysis systems (Network Control Management System – NCMS), Jan 26 – Apr 26: OBP to ingest live updates from "look ahead" facilities from online analysis tools.

Innovation Projects & the Reveal Trials Platform

Ronan Jamieson, Operational Manager

Tom Watts, Senior Energy Balancing Specialist
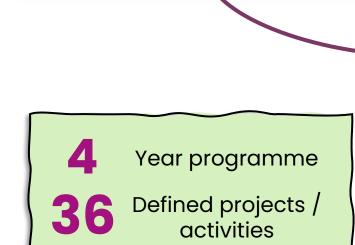
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The Volta Programme

The Volta programme is focused on utilising machine learning (ML) and AI in the control room to:

Optimise forecasting & dispatch decisions, by leveraging cutting edge digital techniques

The aim is ultimately to reduce balancing mechanism costs & help achieve a net zero electricity grid.

4 Year programme

36 Defined projects / activities

✅ **Automated**

✅ **Integrated**

✅ **Probabilistic**

Further information on Volta Projects can be found *here*.
Get involved with NESO innovation *here*.

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The VOLTA Roadmap

Public

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Value and feasibility analyses for input data models

Adaptive machine learning models have been built

Qualitative Benchmarking and a wider impact assessment

Cross-cutting scenarios to deal with stochastic nature of balancing inputs are in place

Integrated optimisation of energy, transmission and reserves

New optimisers have been built

Optimiser design philosophy

Enhanced or automated operator decision support

Automated performance monitoring

Full situational awareness

Project	Supplier
Grand Optimiser (GO)	TBC
Value and Feasibility Analysis (VFA)	MESH AI
Qualitative Benchmarking	AFRY
Real Time Predictions (RPT-i)	IBM & Oxford
Advanced Scheduling Advisor (ASA)	Faculty AI
Validation and Verification	Smiths Inst

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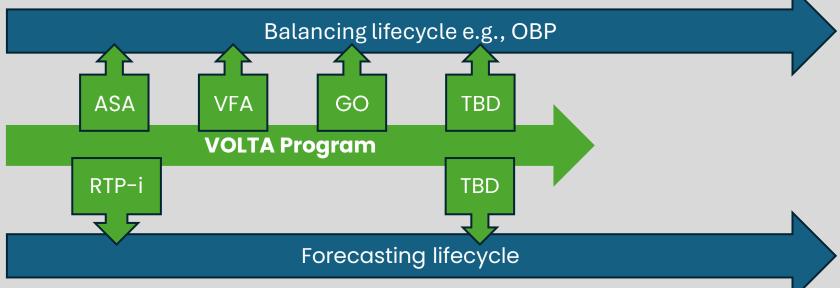
The Balancing Programme and VOLTA

Approach:

- Initial AI/ML exploration

- Create Proof of Concepts (PoC) to understand impacts, challenges, data requirements

- Progress from PoC into OBP

Balancing lifecycle e.g., OBP

ASA VFA GO TBD

VOLTA Program

RTP-i TBD

Forecasting lifecycle
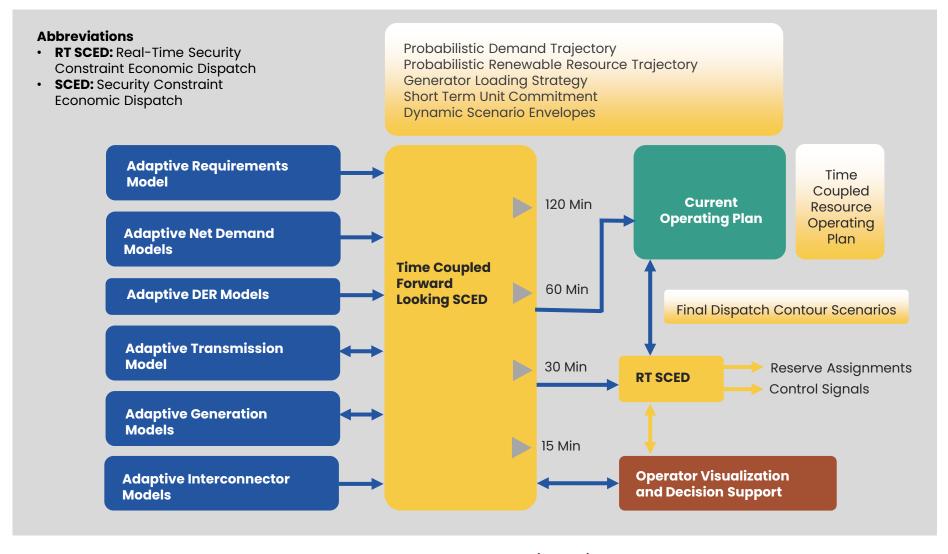
Current inflight projects

- **ASA:** Advanced Scheduler Advisor
- **VFA:** Value and Feasibility Analysis
- **GO:** Grand Optimiser
- **RTP-i:** Real Time Predictions - innovation
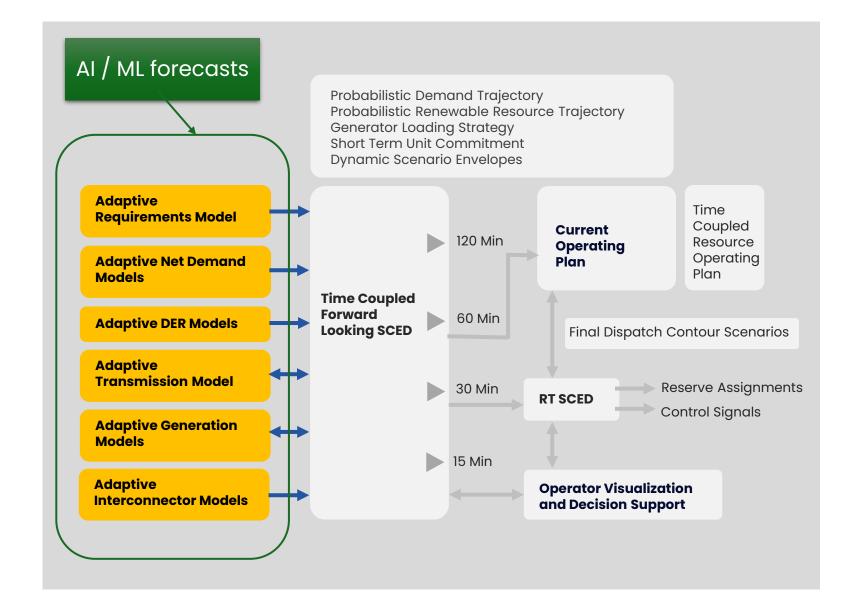
Key Outcomes:

- Early validation of AI/ML for system optimisation.

- Demonstrated AI-driven optimisation capability in operations.

- More economic & secure national dispatch via intelligent optimisers.

The Overall Vision for Volta - Recap

Abbreviations
- **RT SCED:** Real-Time Security Constraint Economic Dispatch
- **SCED:** Security Constraint Economic Dispatch

Probabilistic Demand Trajectory
Probabilistic Renewable Resource Trajectory
Generator Loading Strategy
Short Term Unit Commitment
Dynamic Scenario Envelopes

Adaptive Requirements Model

Adaptive Net Demand Models

Adaptive DER Models

Adaptive Transmission Model

Adaptive Generation Models

Adaptive Interconnector Models

Time Coupled Forward Looking SCED

120 Min

60 Min

30 Min

15 Min

Current Operating Plan

Time Coupled Resource Operating Plan

Final Dispatch Contour Scenarios

RT SCED

Reserve Assignments
Control Signals

Operator Visualization and Decision Support

Volta: Model driven Strategy for Balancing Optimisation (MSBO) | National Energy System Operator

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VFA: Value and Feasibility Analysis Project (In-flight)

AI / ML forecasts

Probabilistic Demand Trajectory
Probabilistic Renewable Resource Trajectory
Generator Loading Strategy
Short Term Unit Commitment
Dynamic Scenario Envelopes

- Adaptive Requirements Model
- Adaptive Net Demand Models
- Adaptive DER Models
- Adaptive Transmission Model
- Adaptive Generation Models
- Adaptive Interconnector Models

Time Coupled Forward Looking SCED

- 120 Min
- 60 Min
- 30 Min
- 15 Min

Current Operating Plan

Time Coupled Resource Operating Plan

Final Dispatch Contour Scenarios

RT SCED
Reserve Assignments
Control Signals

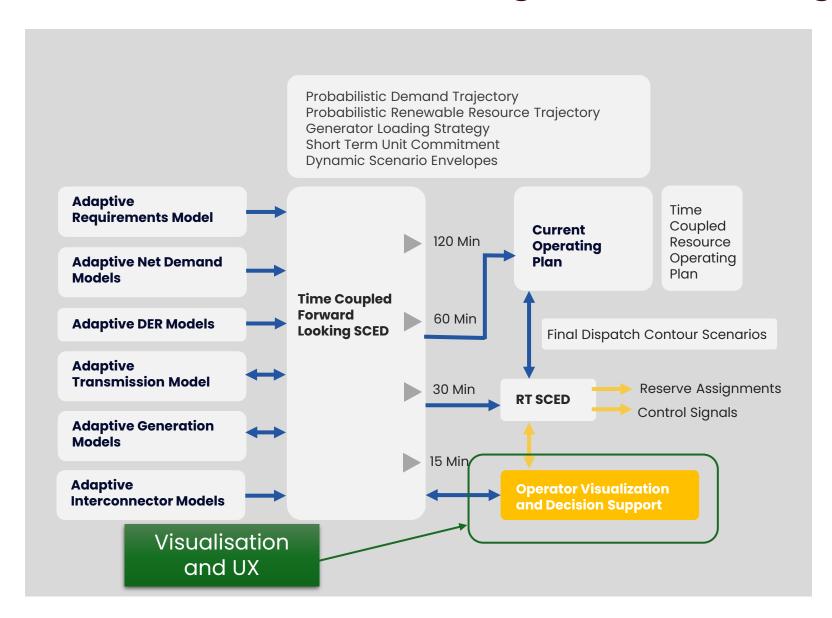**Operator Visualization and Decision Support**

Details	
Description	Project to assess the effectiveness, practicality, and benefits of implementing adaptive data models and deliver a POC
Progress	Design phased finished , developing POC
Expected End Date	August 2025

Abbreviations
- **RT SCED:** Real-Time Security Constraint Economic Dispatch
- **SCED:** Security Constraint Economic Dispatch

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ASA: Advanced Scheduling Advisor (In-flight)

Probabilistic Demand Trajectory
Probabilistic Renewable Resource Trajectory
Generator Loading Strategy
Short Term Unit Commitment
Dynamic Scenario Envelopes

Adaptive Requirements Model

Adaptive Net Demand Models

Adaptive DER Models

Adaptive Transmission Model

Adaptive Generation Models

Adaptive Interconnector Models

Time Coupled Forward Looking SCED

120 Min

60 Min

30 Min

15 Min

Current Operating Plan

Time Coupled Resource Operating Plan

Final Dispatch Contour Scenarios

RT SCED

Reserve Assignments

Control Signals

Operator Visualization and Decision Support

Visualisation and UX

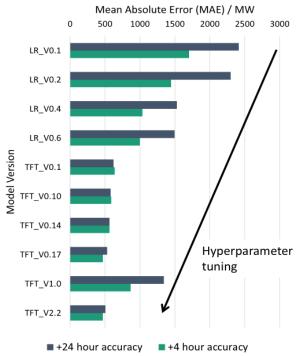| Details	
Description	Delivering a Proof-of-Concept tool for AI based margin analysis
Progress	Discovery finished , design phase
Expected End Date	December 2025

Abbreviations
- **RT SCED:** Real-Time Security Constraint Economic Dispatch
- **SCED:** Security Constraint Economic Dispatch

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RTP-i: Real Time Prediction (In-flight)

Simple models such as Linear Regression are fast to train allowing us to quickly iterate and learn feature importance

Deep learning models can learn complex relationships between many covariates. Higher accuracy but the tuning process takes longer.

Hyperparameter tuning
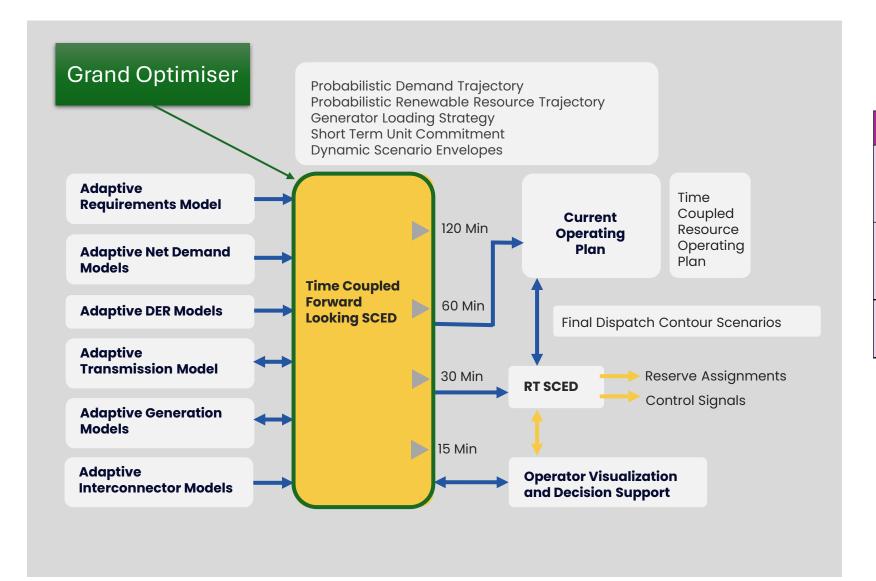
Details	
Description	Improving in-flight RTP project with next generation algorithms
Progress	Second demo delivered, finalising the method
Expected End Date	January 2026

GO: Grand Optimiser (Discovery)

Grand Optimiser

Probabilistic Demand Trajectory
Probabilistic Renewable Resource Trajectory
Generator Loading Strategy
Short Term Unit Commitment
Dynamic Scenario Envelopes

Adaptive Requirements Model

Adaptive Net Demand Models

Adaptive DER Models

Adaptive Transmission Model

Adaptive Generation Models

Adaptive Interconnector Models

Time Coupled Forward Looking SCED

120 Min

60 Min

30 Min

15 Min

Current Operating Plan

Time Coupled Resource Operating Plan

Final Dispatch Contour Scenarios

RT SCED

Reserve Assignments

Control Signals

Operator Visualization and Decision Support

Details	
Description	Design the end to end of optimisation process for scheduling & dispatching
Progress	Contracting in progress
Expected Start Date	July 2025

Abbreviations
- **RT SCED:** Real-Time Security Constraint Economic Dispatch
- **SCED:** Security Constraint Economic Dispatch

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Future Target Areas – Adaptative Scenario Building

Scenario builder

Probabilistic Demand Trajectory
Probabilistic Renewable Resource Trajectory
Generator Loading Strategy
Short Term Unit Commitment
Dynamic Scenario Envelopes

Adaptive Requirements Model

Adaptive Net Demand Models

Adaptive DER Models

Adaptive Transmission Model

Adaptive Generation Models

Adaptive Interconnector Models

Time Coupled Forward Looking SCED

120 Min — Current Operating Plan — Time Coupled Resource Operating Plan

60 Min

Final Dispatch Contour Scenarios

30 Min — RT SCED — Reserve Assignments / Control Signals

15 Min

Operator Visualization and Decision Support

Details	
Description	Moving from a single set of inputs approach to multiple probabilistic inputs leading to a range of potential solutions
Progress	N/A
Expected Start Date	2026

Abbreviations
- **RT SCED:** Real-Time Security Constraint Economic Dispatch
- **SCED:** Security Constraint Economic Dispatch

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Future Target Areas - Reporting, Transparency & Monitoring

Probabilistic Demand Trajectory
Probabilistic Renewable Resource Trajectory
Generator Loading Strategy
Short Term Unit Commitment
Dynamic Scenario Envelopes

Adaptive Requirements Model

Adaptive Net Demand Models

Adaptive DER Models

Adaptive Transmission Model

Adaptive Generation Models

Adaptive Interconnector Models

Time Coupled Forward Looking SCED

120 Min

60 Min

30 Min

15 Min

Current Operating Plan

Time Coupled Resource Operating Plan

Final Dispatch Contour Scenarios

RT SCED

Reserve Assignments
Control Signals

Operator Visualization and Decision Support

AI Performance monitoring

Details	
Description	Providing AI support across the end-to-end balancing process, that will assist in improving transparency, data sharing and market monitoring
Progress	N/A
Expected Start Date	2026
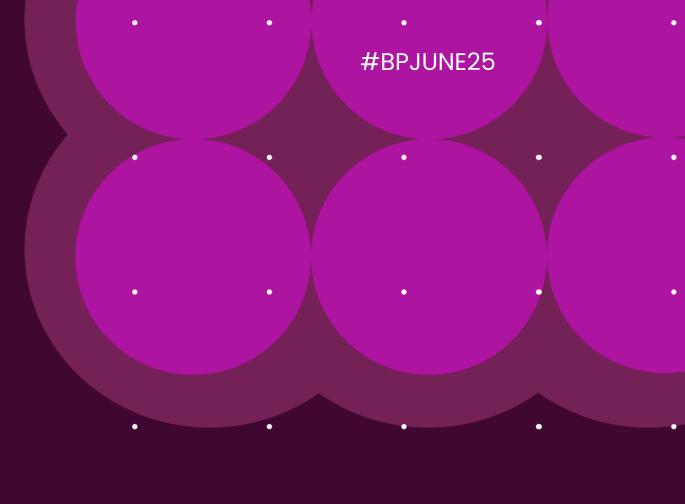
Abbreviations
- **RT SCED:** Real-Time Security Constraint Economic Dispatch
- **SCED:** Security Constraint Economic Dispatch

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The Challenges

How to keep pace with technology developments across the energy landscape, to enable optimised system operation & market management.

Limited opportunities to trial new services & capabilities due to **lengthy approval processes** required for testing in secure environments.

Testing new ideas whilst operating **core operational infrastructure in secure environments.**

What is Reveal?

It is an Azure-hosted, internet-facing test environment that replicates balancing capabilities, including signalling functionality (EDL/EDT)

It is fully ringfenced and separate from Critical National Infrastructure

REVEAL will provide the tools to make trialling of new capabilities easier and faster for NESO and the wider industry

ReVeaT
A one-stop-shop for NESO trialling activities

NESO
National Energy System Operator

Where Does Reveal Sit?

NESO / Reveal

Customer Assets & Technologies

Secure Data Transfer
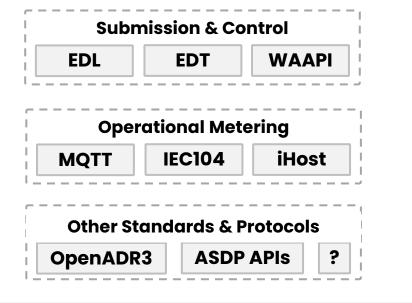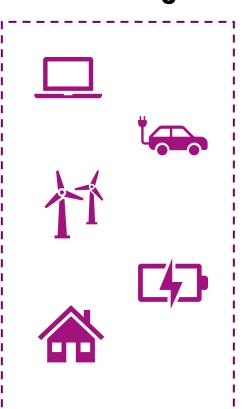
OBP-aligned user interfaces

Submission & Control

| EDL | EDT | WAAPI |

Operational Metering

| MQTT | IEC104 | iHost |

Other Standards & Protocols

| OpenADR3 | ASDP APIs | ? |

Digital Ringfence outside of CNI

ReVeaT
A one-stop-shop for NESO trialling activities

NESO
National Energy
System Operator

History of Reveal

We are requesting your input into our Design work in June '25
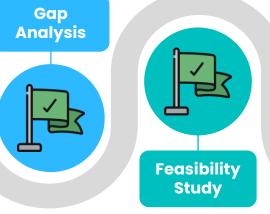
Extensive market engagement across NESO and Industry

Gap Analysis

Feasibility Study

Solution Scoping

Proof of Concept

Production Design

Production Build

Trial

Further Releases & Trials

Validation REVEAL was providing solutions for business needs
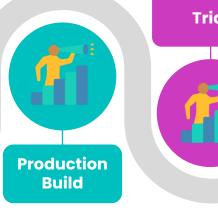
Integrated POC with Kraken to prove EDL, EDT and MQTT capability

Build and release a production version of the REVEAL Live Trial Environment, run a trial, and deliver further iterations to support future capability validation

ReVeaT
A one-stop-shop for NESO trialling activities

NESO
National Energy System Operator
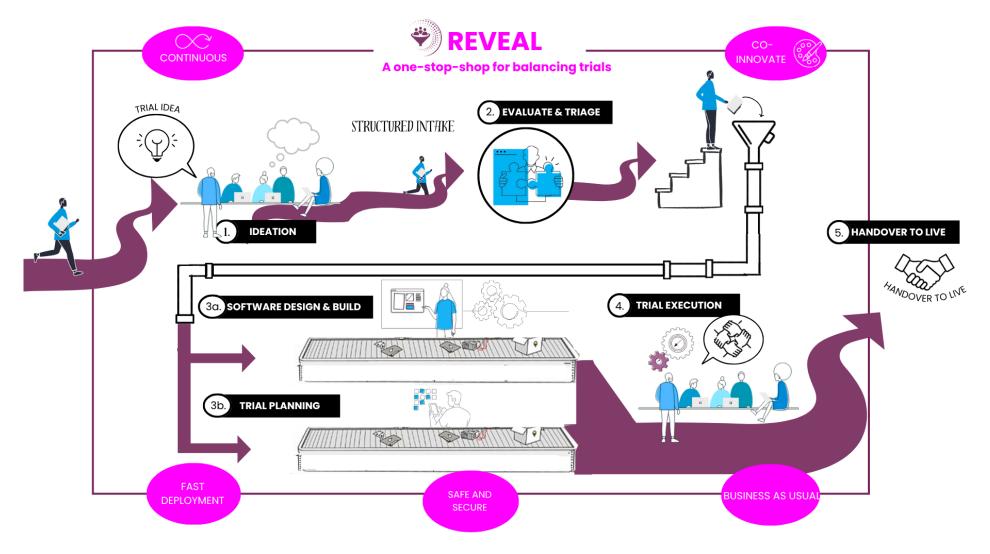
Our Vision

'A one-stop shop for NESO trial activities, driving innovation and operational excellence for **NESO and industry'**

Continuous Delivery Against Our Vision

Signalling & Communications Trials

A signalling or communications trial can be executed to **validate different communication paths, data standards, or new protocols** between the Control Room and Service Providers / Unit Operators.

TIDE Visibility (Transformation to Integrate Distributed Energy)

Low Earth Orbit Satellites

ReVeaT
A one-stop-shop for NESO trialling activities

Tools Trials

A tools trial can be implemented to enable the **development and testing of new technologies, products, and market services.**

GCC0166+ State of Charge

Onboarding Sandbox

ReVeaT
A one-stop-shop for NESO trialling activities

We Want to Hear From You . . .

Q&A

Q&A to cover any questions about Reveal and the capabilities

Tell us your ideas

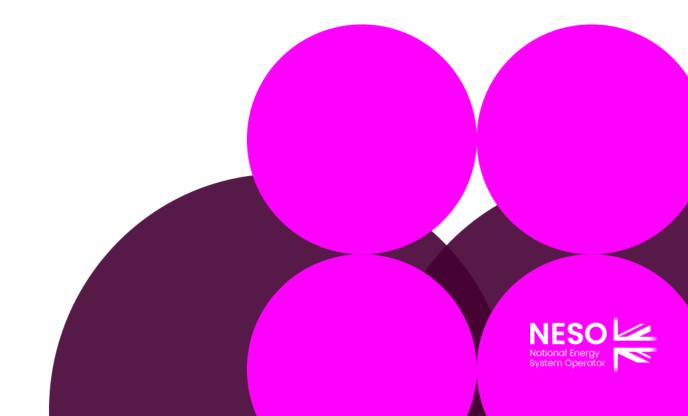Capture your problem statements and potential solutions on the forms provided

Post them in the 'Cool Stuff' box

ReVeaT
A one-stop-shop for NESO trialling activities

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Thank you for your input!

- Your ideas will be fed into the design of REVEAL

- Make sure you sign up to the distribution list for updates

A Day in the Life of a Control Room Engineer

Alex Carter, Control Room Operational Manager

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Managing the System

Network Access Planning (NAP) Team

Carryout network analysis using the offline transmission analysis tool (OLTA) in a time frame from 8+ year ahead to 24 hour ahead – produce outage plan.

Trading Team

Energy Market, sufficient margins

Energy Forecasting Team

National Demand
Solar, wind, GSP demand

Systems:
- Energy Forecasting System (EFS)
- Platform for Energy Forecasting (PEF)

Strategy Team

Plan for security of the system based on Security & Quality of Supply Standard (SQSS), from 24 hours to 4 hours ahead of time.

Scheduling, System Operating Plan, Margin Analysis, Data Processing and Profiling

System: Scheduling Platform in Controlled Environment (SPICE)

Handover of outage notes

Handover of Transmission System Operating Plan (TSOP)

Handover of System Operating Plan (SOP)

Real Time Operation

Transmission Team

- Monitoring & managing System flows, outages, faults, and voltages following SQSS to ensure Security of the System.

Energy Team

- Monitoring & managing System Frequency following SQSS, and Transmission Constraints.

- Demand Prediction, Dispatch Advice, Energy Balancing i.e., Issuing Instructions (BM & Non-BM), Ancillary Service Management.

Systems:
- System Operation in Real-Time (SORT)
- Versatile Graphical Instruction Logger (VERGIL)
- Contingency Logging System (CLOGS)
- Open Balancing Platform (OBP)
- Ancillary Services Dispatch Platform (ASDP)

Control Room Teams

Power System Manager (PSM)

Brendan Lyons

Strategy Team

- Operational Strategy Manager (OSM)
- Control Technical Assistant (CTA)
- Assistant National Scheduling Engineer (aNSE)
- National Scheduling Engineer (NSE)
- Transmission Analysis Engineer- Scotland (TAEs)
- Transmission Analysis Engineer- E&W (TAEe&w)
- Day Ahead Congestion Forecasting Engineer (DACF)

Energy Team

Alex Carter
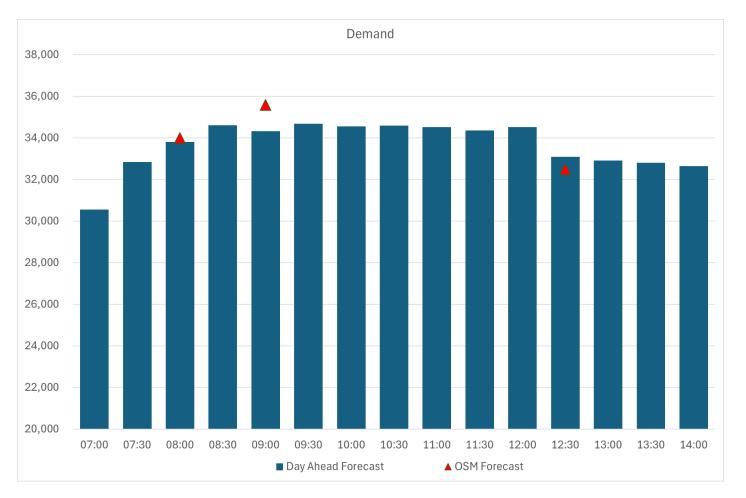
- Operational Energy Manager (OEM)
- National Balancing Engineer (NBE)
- Assistant National Balancing Engineer South (aNBE)
- Assistant National Balancing Engineer North (aNBE)
- Assistant National Balancing Engineer – Battery (additional post added)

Transmission Team

- Transmission Security Manager (TSM)
- Transmission Security Engineer- Scotland North(TSESc-n)
- Transmission Security Engineer- Scotland South(TSESc-s)
- Assistant Transmission Security Engineer – E&W North (aTSEe&wn)
- Transmission Security Engineer- E&W North(TSEe&wn)
- Transmission Security Engineer- E&W South(TSEe&ws)
- Assistant Transmission Security Engineer – E&W South (aTSEe&ws)

Friday 14th March 2025 Morning Shift

From the perspective of the Energy Team

Demand

Legend: ■ Day Ahead Forecast ▲ OSM Forecast

Spring Morning – Weather Forecast

Morning peak

Cold and frosty start in the southeast

Cloudy but chilly elsewhere, with showers from the North Sea, potentially heavy and falling as snow over hills. Bright spells between showers.

Milder later in the day with a shift in wind direction from northerly to south - southeasterly, bringing milder air from the continent.

Highs around 10ºC

Up to 7GW PV forecast
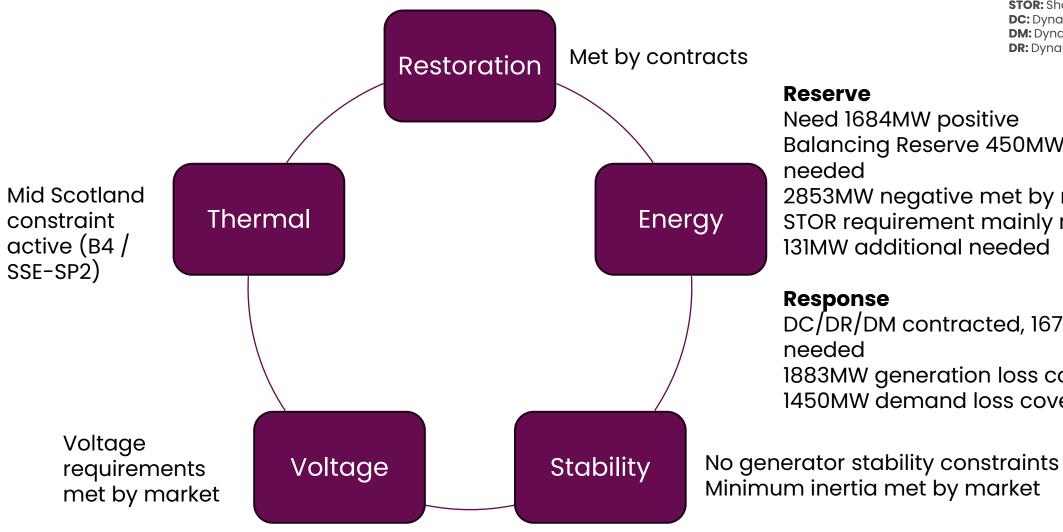
Abbreviations:
- **OSM:** Operational Strategy Manager

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System Security

Abbreviations:
STOR: Short Term Operating Reserve
DC: Dynamic Containment
DM: Dynamic Moderation
DR: Dynamic Regulation

Restoration — Met by contracts

Reserve
Need 1684MW positive
Balancing Reserve 450MW, additional needed
2853MW negative met by market
STOR requirement mainly met by contracts, 131MW additional needed
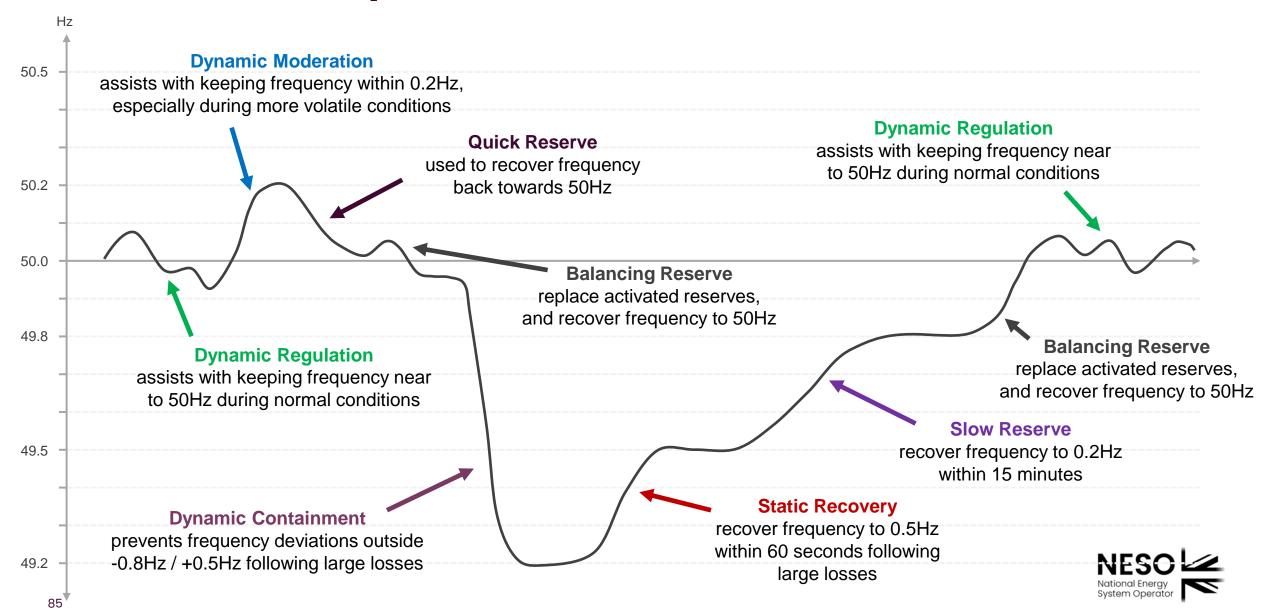
Response
DC/DR/DM contracted, 167MW additionally needed
1883MW generation loss covered
1450MW demand loss covered

Energy

Thermal — Mid Scotland constraint active (B4 / SSE–SP2)

Stability — No generator stability constraints. Minimum inertia met by market

Voltage — Voltage requirements met by market

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Reserve and Response Services

Dynamic Moderation
assists with keeping frequency within 0.2Hz, especially during more volatile conditions

Quick Reserve
used to recover frequency back towards 50Hz

Dynamic Regulation
assists with keeping frequency near to 50Hz during normal conditions

Dynamic Regulation
assists with keeping frequency near to 50Hz during normal conditions

Balancing Reserve
replace activated reserves, and recover frequency to 50Hz

Balancing Reserve
replace activated reserves, and recover frequency to 50Hz

Dynamic Containment
prevents frequency deviations outside -0.8Hz / +0.5Hz following large losses

Slow Reserve
recover frequency to 0.2Hz within 15 minutes

Static Recovery
recover frequency to 0.5Hz within 60 seconds following large losses

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System Operating Plan Morning Peak (2A @ 09:15)

2A Final Plan @ 05:28

- 35.6 GW peak demand
- 3.0 GW wind
- 4.8 GW interconnector import
- <0.1 GW batteries (PN)
- 0 GW Small BMUs

Risk Management

- Demand uncertainty
- Cold morning could mean higher demand
- Clear skies could mean higher PV
- Therefore, flexible options

NESO Actions

- Connah's Quay 2 05:59-11:59 (0.3 GW)
- Interconnector trades (1.3 GW)
- Batteries (0.5 GW)
- Small BMUS (0.5 GW)
- Pumped Storage (1.2GW)
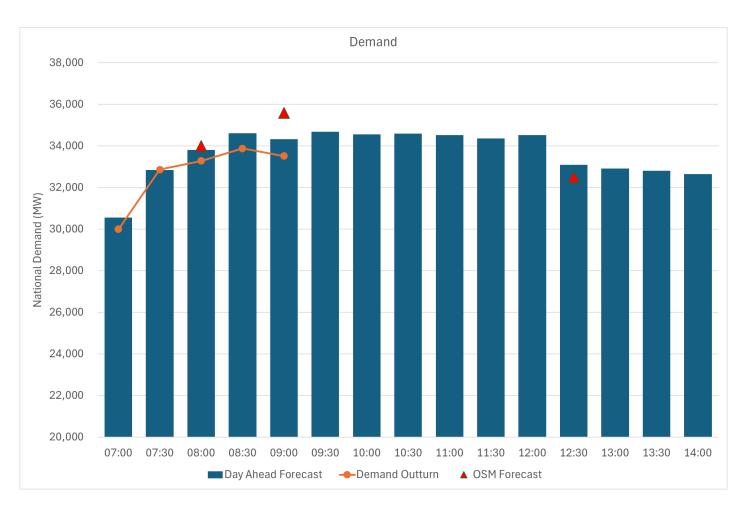- Spalding Expansion, 20 minutes to full load (0.2 GW)

NESO Contingency Actions

- Small BMUs
- Additional CCGTs or advances from afternoon PNs
- Potentially more batteries depending on state of charge

Abbreviation: CCGT: Combined Cycle Gas Turbine

Friday 14ᵗʰ March 2025 Morning Shift

Approaching the morning peak

Towards forecast peak at 09:15

Demand starting to out turn below the forecast

Batteries, pumped storage and thermal units used to manage energy imbalance

Some wind being bid down to manage Mid Scotland constraint
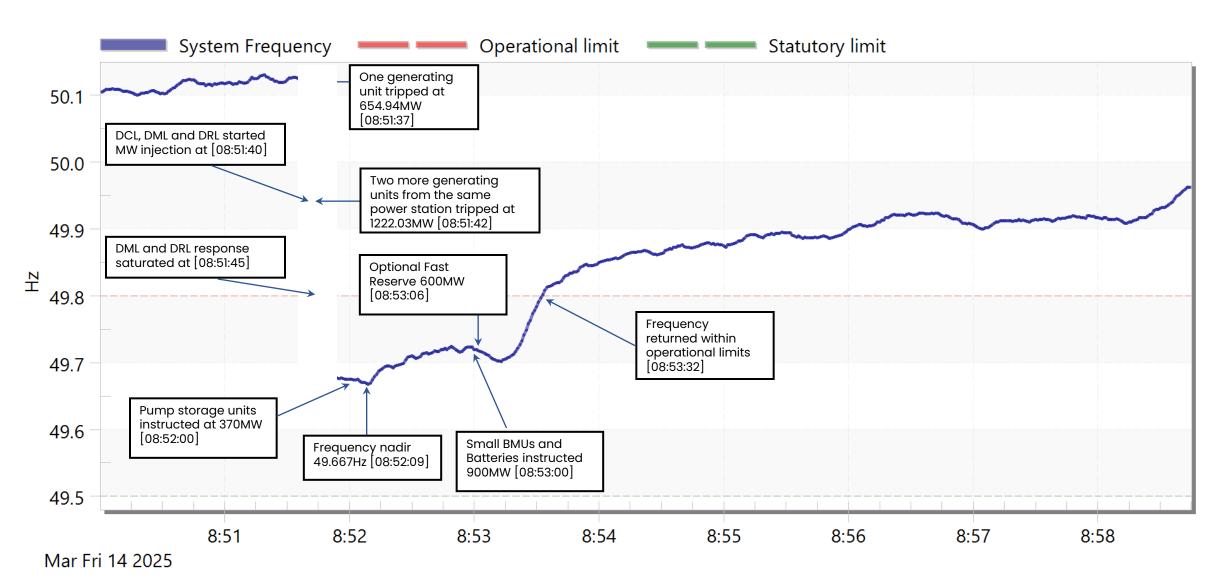
Not all pumped storage identified in SOP instructed

Spalding Expansion not run

At 08:50 frequency near 50.1 Hz as demand continues to outturn lower than forecast

Demand

Legend: ■ Day Ahead Forecast — ●— Demand Outturn ▲ OSM Forecast

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System Conditions Before the Event

Date and time	Friday, 14th March 2025 at 08:51:37
National Demand	34.85GW
System frequency	50.12Hz
Inertia	276.4GVA.s
Contracted Response Services	Dynamic Containment – Low (DC–L): 1153MW Dynamic Regulation – Low (DR–L): 480MW Dynamic Moderation – Low (DM–L): 147MW Static Firm Frequency Response (sFFR): 185MW MFR: Primary (P): 56 MW Secondary (S): 71 MW High (H): 177 MW
Weather	3.05GW transmission-connected wind 832MW estimated embedded wind 4.12GW estimated embedded solar

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Event Overview

- At 08:51 hrs on 14th March 2025 a significant loss of infeed of around 1,877MW occurred due to the trip of three generating units.

- This event was well contained. The lowest frequency reached was 49.667Hz.

- Frequency returned above operational limits within 3min and to 50Hz in 12min.

- OBP 58 instructions, 843 MW

- SORT 12 instructions, 500 MW

- VERGIL 6 instructions 740 MW

- No demand or generation interrupted.

- This was the largest event since the August 2019 where ~1.9GW loss led to frequency falling to 48.8Hz and 1.1 million customers disconnected.

- Before the current Frequency Risk and Control Report (FRCR) policy, dynamic response products, and OBP were introduced.

#BPJUNE25

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Response Service Performance

- System behaved as expected during the event.
- Based on current available performance monitoring data, Dynamic Response Services, i.e. DC, DR and DM, responded to the event as expected containing frequency from deviating further.
- Total contracted LF volume at the time of the event was 1780 MW. The average performance score in the settlement period relevant to the event is above 90% indicating a good performance of dynamic services.
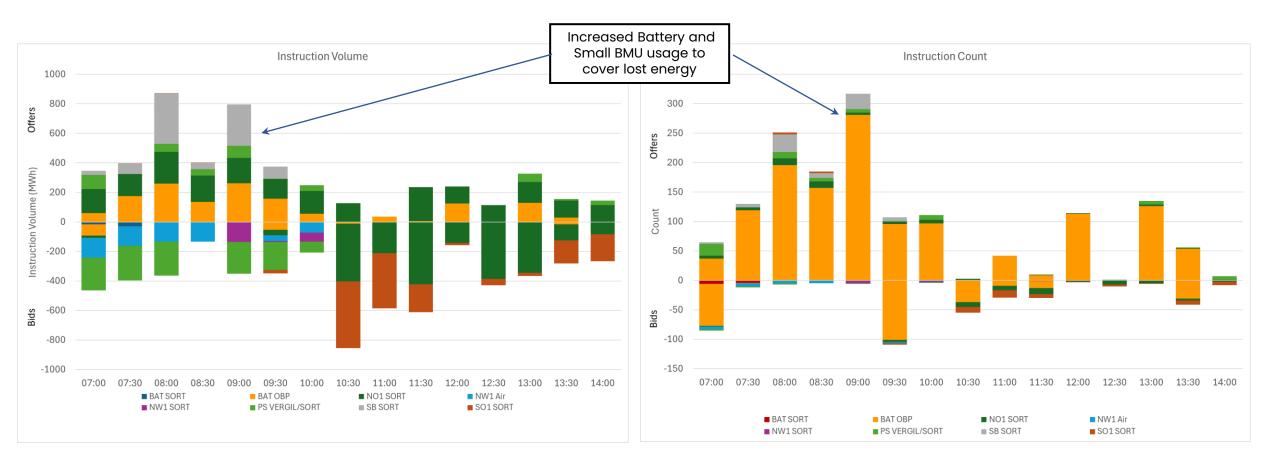
Service	Available volume (MW)	Contracted volume (MW)	Shortfall (MW)	Notes
DC-L	1077	1153	78	Shortfall were due to declared unavailability and no data submission when analysing
DM-L	128	147	19	
DR-L	480	480	0	
Total	**1683**	**1780**	**97**	

Instruction Volumes & Counts
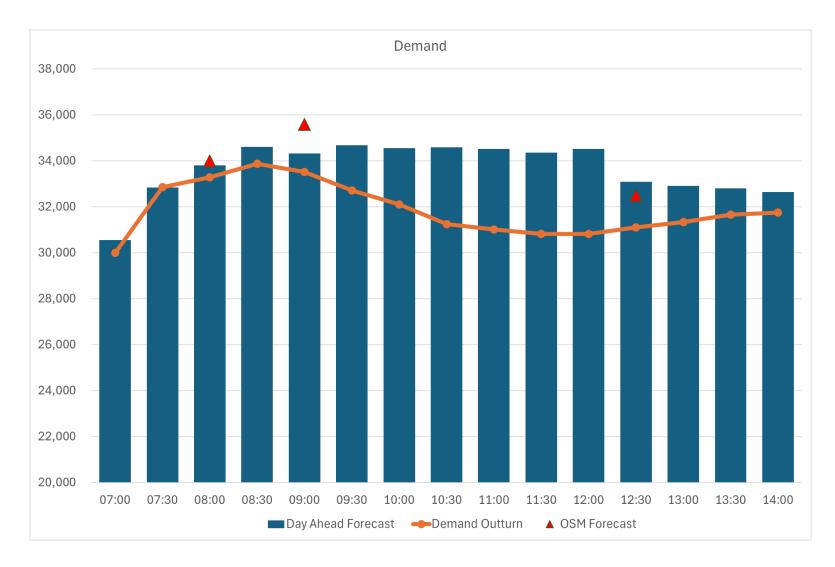
OBP used to manage batteries throughout the shift

- Fast Dispatch for frequency control e.g., following the large loss
  - Target Dispatch for instructions 5-15 minutes ahead

Remainder of the Shift

Demand

- Demand continued to outturn below the forecast

- Suspected higher PV outturn than forecast

- Lower demand outturn, overall decaying demand and market position meant no replacement units were needed

- No more wind bids were needed after 10:11

- Tripped units returned at 12:00, 12:30 and 13:00

Market Services Update

Jon Wisdom, Head of Market Change Delivery

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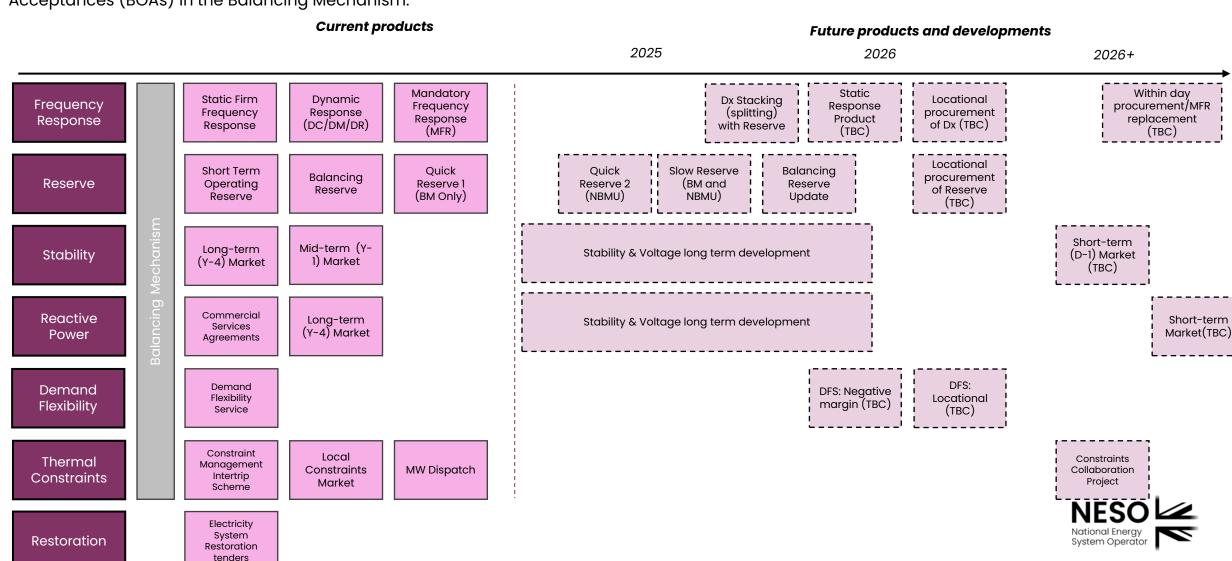
Market and Ancillary Services – Overview and Roadmap

To operate a safe and secure power system, NESO procure a suite of ancillary services through designated markets and via Bid Offer Acceptances (BOAs) in the Balancing Mechanism.

Current products

Future products and developments

2025 — 2026 — 2026+

Balancing Mechanism

Category	Current products			Future products and developments			
Frequency Response	Static Firm Frequency Response	Dynamic Response (DC/DM/DR)	Mandatory Frequency Response (MFR)	Dx Stacking (splitting) with Reserve	Static Response Product (TBC)	Locational procurement of Dx (TBC)	Within day procurement/MFR replacement (TBC)
Reserve	Short Term Operating Reserve	Balancing Reserve	Quick Reserve 1 (BM Only)	Quick Reserve 2 (NBMU) / Slow Reserve (BM and NBMU) / Balancing Reserve Update		Locational procurement of Reserve (TBC)	
Stability	Long-term (Y-4) Market	Mid-term (Y-1) Market		Stability & Voltage long term development			Short-term (D-1) Market (TBC)
Reactive Power	Commercial Services Agreements	Long-term (Y-4) Market		Stability & Voltage long term development			Short-term Market (TBC)
Demand Flexibility	Demand Flexibility Service			DFS: Negative margin (TBC)	DFS: Locational (TBC)		
Thermal Constraints	Constraint Management Intertrip Scheme	Local Constraints Market	MW Dispatch				Constraints Collaboration Project
Restoration	Electricity System Restoration tenders						

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Balancing Services – Dynamic Response Current Service Design Status

	Needs case	Options assessment	Service design	Formal Consultation	Go Live
Engagement					
Instructible Dynamic Response			⭐		
Static Response Reform		⭐			
Locational procurement		⭐			
30 Minute Service Window	⭐				
Stacking Response/Reserve	⭐				

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Balancing Services - Instructible Dynamic Response

The draft Service Design was issued to industry in March 2025

Key considerations in the service design for instructible Dynamic Response:

Limits and Prices	Capability curves	Instructions and stacking	Performance Monitoring
Declare offerings for each service	Determine maximum available response	Instructions are open-ended	Performance targets aggregated
Commitments become firm at deadline	Adapt to other instructions, variable baselines	Splitting with day-ahead response	Transparency data published

Following industry feedback in a number of areas, but particularly in terms of submission deadlines and the design of payments. We are looking to evolve the service design further - we hope to update industry again later in June.

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Balancing Services – Locational procurement of Response and Reserve

Drivers for Locational Procurement

Constraints in the transmission network

Constraints in the distribution networks

Impact on stability / inertia

Locational Procurement Webinar
Wed, 9 Jul 2025 15:00 – 16:00 (UTC+00:00)

Provider Considerations

Minimise business process disruption

Unit Aggregation

Bidding and Dispatch Considerations

Partial unit acceptance

Fractional bids

Order and Pricing Considerations

Clearing price definition

Gaming risks

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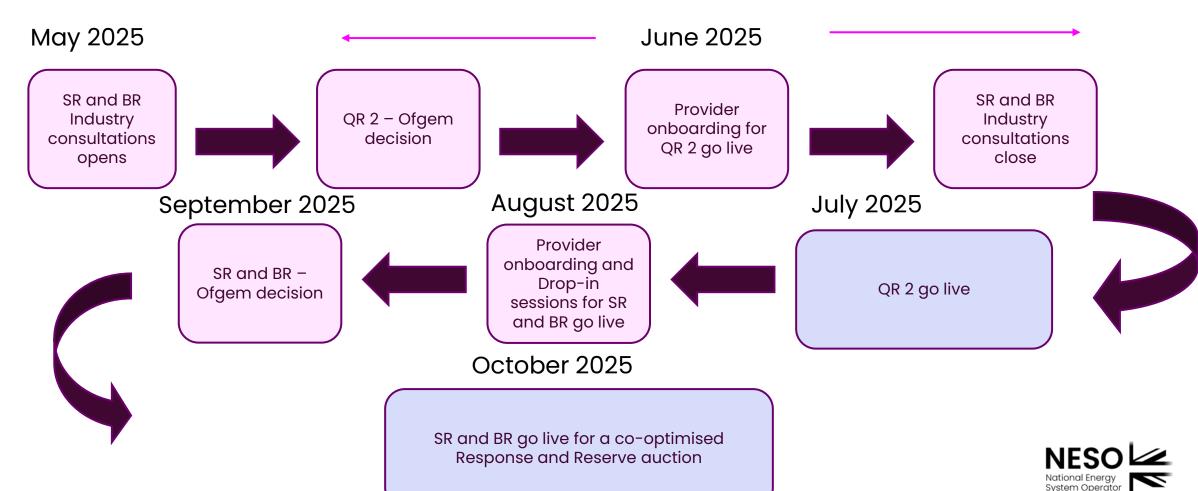
Reserve Reform timeline

Quick Reserve – Phase 2 (QR 2) / Slow Reserve (SR) / Balancing Reserve (BR)

May 2025

June 2025

| SR and BR Industry consultations opens | → | QR 2 – Ofgem decision | → | Provider onboarding for QR 2 go live | → | SR and BR Industry consultations close |

September 2025

August 2025

July 2025

| SR and BR – Ofgem decision | ← | Provider onboarding and Drop-in sessions for SR and BR go live | ← | QR 2 go live |

October 2025

SR and BR go live for a co-optimised Response and Reserve auction

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Balancing Services – Static Response Reform

Current Limitation

Proposed Development

Benefit

Lack of control of unit delivery

Limited visibility of unit output

Limited understanding of locality of units

Auction held at different time to other auctions

Forecasts used co-optimise service procurement

Bespoke, manual email process for bid submission

Flexible activation period/early cease instruction

Live operational metering feed

Align aggregation rules with Dx services

Co-optimised auction capability with Dx services

Align auction timing with other Dx services

Facilitate greater holding of Static response

Increased consumer value through true co-optimisation of services

Opportunities for providers to co-optimise and stack bids across NESO services

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Beyond 2025

Neil Morgans, Principal Product Manager

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Beyond 2025: Roadmap Progress Update

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Our Goal

*A Strategic Roadmap
for Future Balancing*

Our Progress So Far

>250 Industry Stakeholders Engaged

>70 Capability Survey Responses

> 70 Balancing Programme Relationship
Management Meetings

>60 Internal Interviews and Workshops
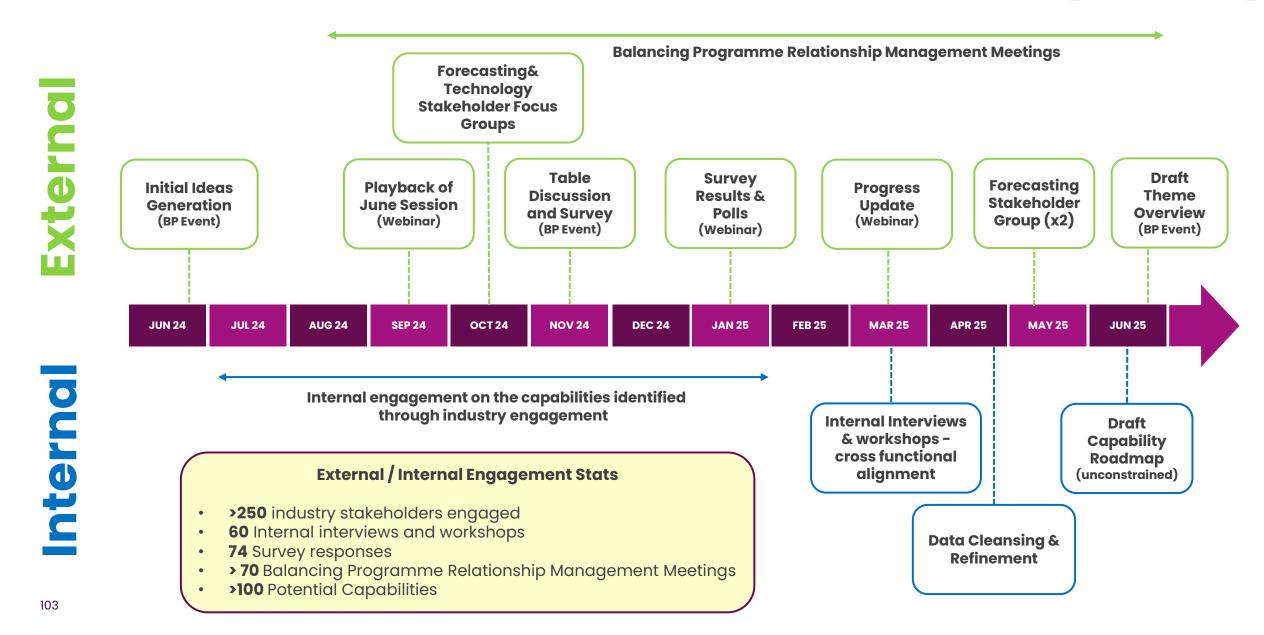
>100 Potential Capabilities Identified

Our Purpose Today

*Sharing High-Level
Themes and Outcomes*

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Building the Roadmap: Journey So Far

Balancing Programme Relationship Management Meetings

External

Forecasting & Technology Stakeholder Focus Groups

Initial Ideas Generation (BP Event)

Playback of June Session (Webinar)

Table Discussion and Survey (BP Event)

Survey Results & Polls (Webinar)

Progress Update (Webinar)

Forecasting Stakeholder Group (x2)

Draft Theme Overview (BP Event)

JUN 24	JUL 24	AUG 24	SEP 24	OCT 24	NOV 24	DEC 24	JAN 25	FEB 25	MAR 25	APR 25	MAY 25	JUN 25

Internal

Internal engagement on the capabilities identified through industry engagement

Internal Interviews & workshops - cross functional alignment

Draft Capability Roadmap (unconstrained)

Data Cleansing & Refinement

External / Internal Engagement Stats

- **>250** industry stakeholders engaged
- **60** Internal interviews and workshops
- **74** Survey responses
- **> 70** Balancing Programme Relationship Management Meetings
- **>100** Potential Capabilities

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⚡ Future Energy Services

Key Developments:
- Market service enhancements integrated to balancing platform
- New inertia, voltage, fault level support sources integrated (OBP).

Key Outcomes:
- **Greater engagement** from wider participants, unlocking new flexibility.
- **Enhanced grid resilience** (stability, power quality, fault levels).

⚛ Enhanced Dispatch

Key Developments:
- Enhanced short-term constraint data integrated into OBP
- Initial AI exploration (Volta: scheduling, optimisation Proof of Concepts).

Key Outcomes:
- **Lower skip rates**, more precise, cost-effective real-time balancing & improved constraint management
- **Early validation of AI** for system optimisation.

FY27 Foundational Capabilities & Early Strategic Wins

🔄 Whole System & Flex

Key Developments:
- OBP scheduling & dispatch fully integrated (legacy systems retired)

Key Outcomes:
- **Streamlined balancing system,** greater flexibility, reduced operational complexity.
- Readiness for **future integration and expansion.**

👁 Data & Transparency

Key Developments:
- Completion of core data systems integration within OBP, enabling increased interaction volume and enhanced flexibility in how data is accessed, shared, and consumed.
- Enhanced data & models on PEF

Key Outcomes:
- **Improved transparency**, interoperability, tailored data offerings.
- **Lower balancing costs** with richer & more accurate modelling

Please note: This is an indicative unconstrained high-level view of capabilities and not a delivery commitment. This also excludes REMA capabilities.

🔌 Future Energy Services

Key Developments:
- OBP expands for diverse small-scale/demand-side flexibility
- Markets enabled for stacked/sequential, intraday services

Key Outcomes:
- **Increased utilisation** of distributed flexibility.
- New market revenue opportunities, **more efficient system balancing.**

⚛ Enhanced Dispatch

Key Developments:
- OBP enables non-integer dispatch
- Volta AI optimisation progresses beyond PoC

Key Outcomes:
- Demonstrated **AI-driven optimisation capability** in operations.
- **More precise & real-time balancing** via improved forecasting and automated dispatch

FY28
Expanding Flexibility & Coordination

🔄 Whole System & Flex

Key Developments:
- Initial Primacy Rules integration into OBP

Key Outcomes:
- **Improved TSO-DSO coordination** and whole system decision-making.
- **Improved optimisation accuracy**, unlocking smaller-scale flexibility.

👁 Data & Transparency

Key Developments:
- Enhanced price visibility across ancillary services
- Centralised operational data storage
- Improved DER visibility & enhanced renewable forecasting

Key Outcomes:
- More **transparent pricing and robust audit processes**.
- **Greater data integrity** for market monitoring.

Please note: This is an indicative unconstrained high-level view of capabilities and not a delivery commitment. This also excludes REMA capabilities.

Future Energy Services

Key Developments:
- Operational data available to new Restoration Decision Support Tool
- Local procurement of response/reserve services enabled

Key Outcomes:
- **Enhanced restoration decision-making**, faster system recovery.
- **Improved balancing efficiency**, reduced reliance on costly national actions.

Enhanced Dispatch

Key Developments:
- AI-enabled optimisers deployed in OBP
- Advanced network modelling (incl. DNO data) into OBP

Key Outcomes:
- **More economic & secure national dispatch** via intelligent optimisers.
- **Reduced constraint costs**, improved coordinated system optimisation.

FY29
Embedding Intelligence & System Optimisation

Whole System & Flex

Key Developments:
- Advanced network modelling enhances control room decision-making
- TIDE project enhances availability/quality of DER data.

Key Outcomes:
- **Improved operational decision quality** from richer network insights.
- **More accurate DER forecasts**, supporting improved system planning.

Data & Transparency

Key Developments:
- Control room decision rationale capture standardised

Key Outcomes:
- Improved accountability, knowledge sharing, & auditability.

106 **Please note: This is an indicative unconstrained high-level view of capabilities and not a delivery commitment. This also excludes REMA capabilities.**

🔌 Future Energy Services

Key Developments:
- Optimised DC flow management capabilities (OBP)
- Full integration of TIDE project outcomes into OBP (DER/CER participation)

Key Outcomes:
- **Enhanced DC network capacity utilisation & efficiency.**
- **Maximises value of distributed/consumer flexibility.**

⚛ Enhanced Dispatch

Key Developments:
- AI-driven Control Room visualisation tools enhanced
- OBP optimisation engine upgraded (advanced solvers)

Key Outcomes:
- More **intuitive grid insights** for operators.
- **Faster, effective decision-making** in complex conditions.

🔄 Whole System & Flex

Key Developments:
- OBP scaled for up to 10,000 BMUs
- Advanced AI models for forecasting distributed/consumer flex

Key Outcomes:
- **Full OBP scalability for market growth**, future-proofs operations

👁 Data & Transparency
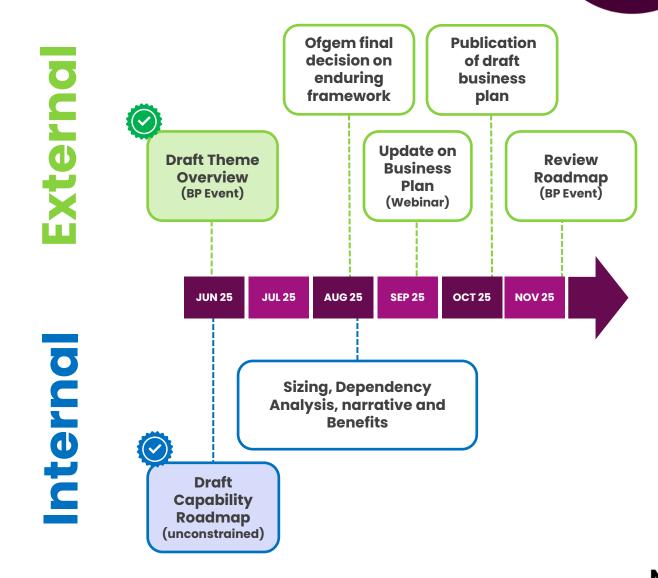
Key Developments:
- Full tracking for operator decision timelines (OBP)
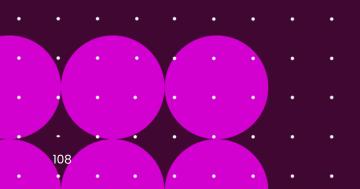- Advanced AI models improve consumer flex forecasting

Key Outcomes:
- **Enhances transparency, accountability, & post-event review.**
- **Improved operational planning** via reliable flex forecasts.

FY30/31 Delivering a Scalable & Future-Ready System

Please note: This is an indicative unconstrained high-level view of capabilities and not a delivery commitment. This also excludes REMA capabilities.

Building the Roadmap: Next Steps

Public

Q&A

#BPJUNE25

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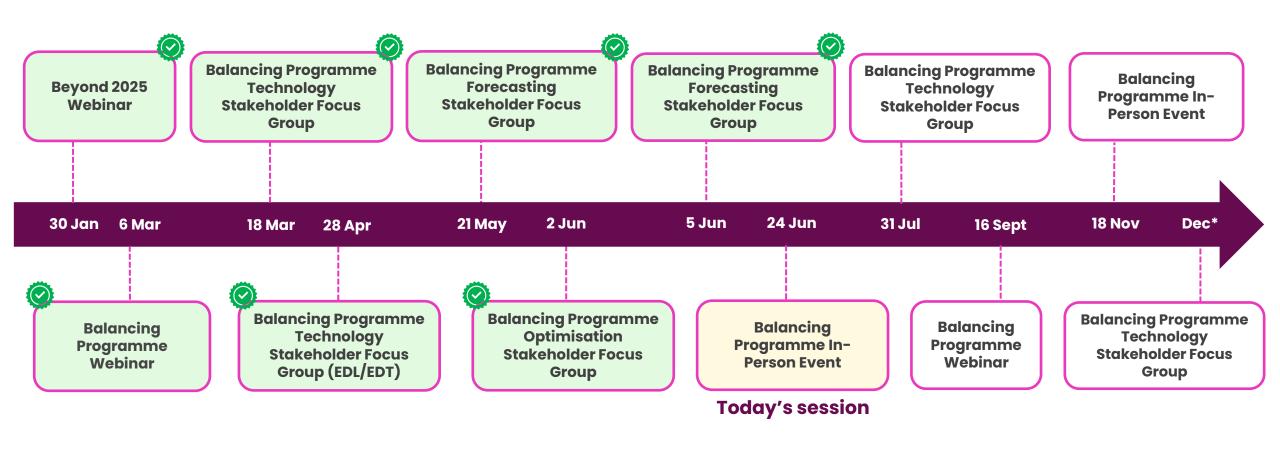
2025 External Engagement Timeline

Beyond 2025 Webinar

Balancing Programme Technology Stakeholder Focus Group

Balancing Programme Forecasting Stakeholder Focus Group

Balancing Programme Forecasting Stakeholder Focus Group

Balancing Programme Technology Stakeholder Focus Group

Balancing Programme In-Person Event

| 30 Jan | 6 Mar | 18 Mar | 28 Apr | 21 May | 2 Jun | 5 Jun | 24 Jun | 31 Jul | 16 Sept | 18 Nov | Dec* |

Balancing Programme Webinar

Balancing Programme Technology Stakeholder Focus Group (EDL/EDT)

Balancing Programme Optimisation Stakeholder Focus Group

Balancing Programme In-Person Event

Today's session

Balancing Programme Webinar

Balancing Programme Technology Stakeholder Focus Group

Balancing Programme **relationship management meetings** throughout 2025 & **external NESO newsletters 'Energising Progress'** with Balancing Programme content issued regularly, providing updates between online & in-person events.

NESO
National Energy System Operator

Next Steps

We welcome your feedback & questions – please get in contact with us at **box.balancingprogramme@neso.energy**

Slides from today's session will be published on our website.

Subscribe to our new NESO newsletter 'Energising Progress' **here** **–** please select **Future of Balancing Services inc. Balancing Programme** to keep up to date.

Sign-up to our Stakeholder Focus Groups for Optimisation, Technology, & Forecasting - **Balancing Programme Stakeholder Focus Groups.**

If you are interested in a regular meeting with a representative from the Programme and would like more information, please get in contact using the email address above.

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Balancing Programme September 2025 Webinar

Date: 16 September 2025

Time: 11:00am – 12:30pm

Location: Microsoft Teams

We will share the latest on our Balancing and Forecasting capabilities planned for delivery into the Control Room and provide an update on progress to shape our capabilities beyond 2025 using Industry input.

A more detailed agenda will be shared closer to the webinar

To sign up to the event, click **here** or scan the QR code below