Public

NESO Technology Advisory Council

TAC-18 7th March 2025

Meeting pack

NESO
National Energy System Operator

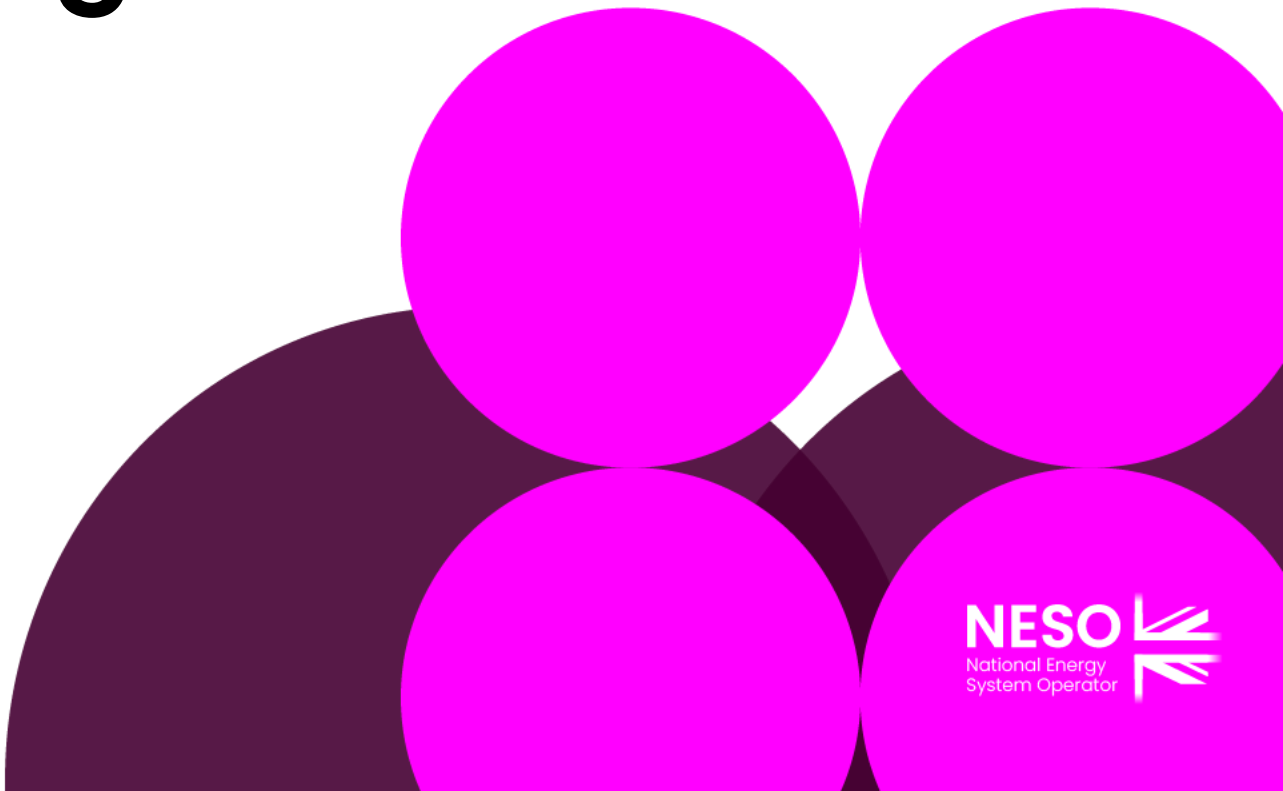
TAC-18 agenda – 7th March 2025

Item	Start	Finish	Time	Item	Presenter	Notes
1	9:00	09:05	5	**Welcome & Apologies**	Eric Brown	
2	09:05	09:10	5	**Minutes of last meeting and matters arising**	Eric Brown	
3	09:10	09:20	10	**Feedback from the last meeting**	Cameron Shade	
4	9:20	9:35	15	**Survey response and next steps**	Eric Brown	
5	9:35	10:15	40	**Data Sharing Infrastructure**	Simon Evans	
6	10:15	10:55	40	**Sector Digitalisation Plan**	Carolina Tortora	
	10:55	11:10	15	**BREAK**		
7	11:10	11:50	40	**Data programme**	Michelle Berti	
8	11:50	12:00	10	**Open Balancing Platform Update**	Brendan Lyons	
9	12:00	12:10	10	**Subgroups update**	Cameron Shade	
10	12:10	12:20	10	**Next meeting**	Eric Brown	Next meeting: Friday 6th June 2025
11	12:20	12:30	10	**AOB**	Eric Brown	

Welcome and apologies

Item 1

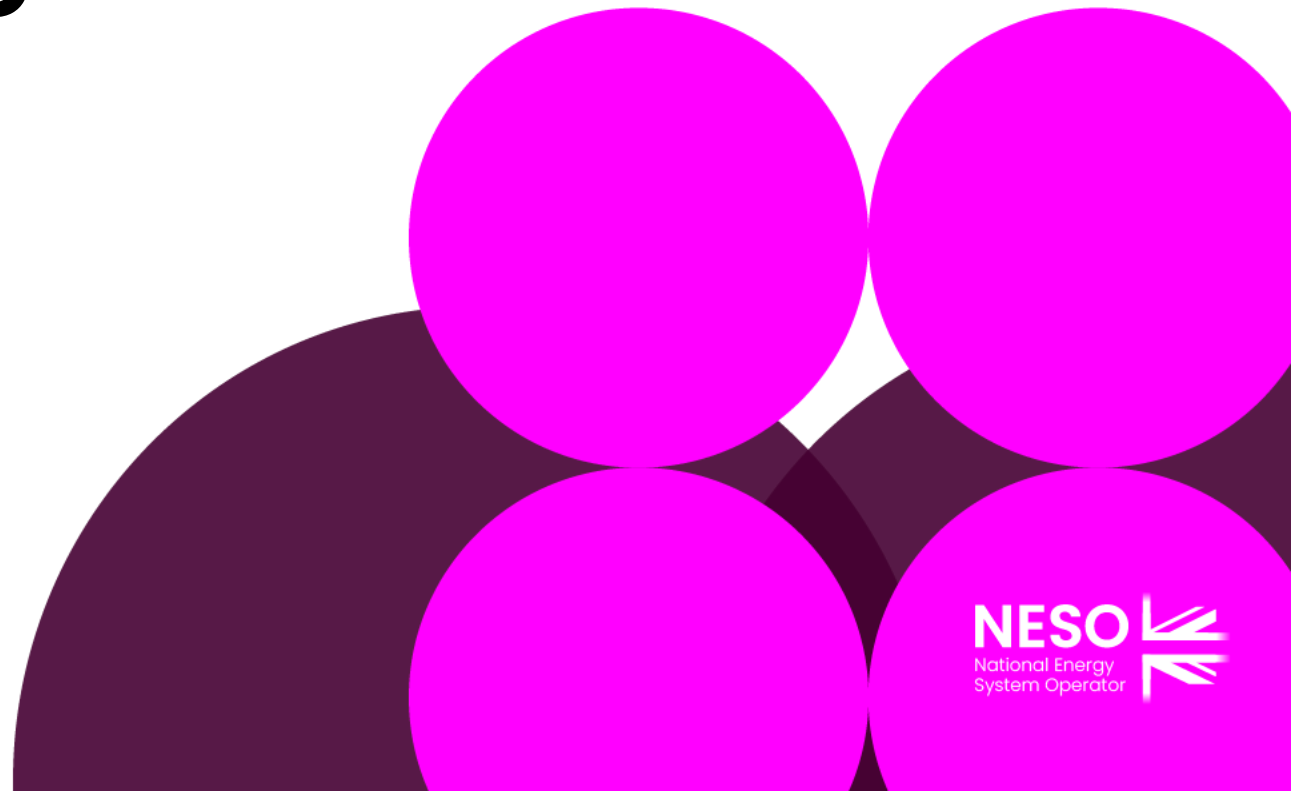
Eric Brown



Minutes of last meeting and matters arising

Item 2

Eric Brown



Minutes of last meeting and matters arising

- Minutes of TAC-17 have been published on the ESO website.
- The material from the meeting has also been published.
- This section will be used to discuss any matters arising.

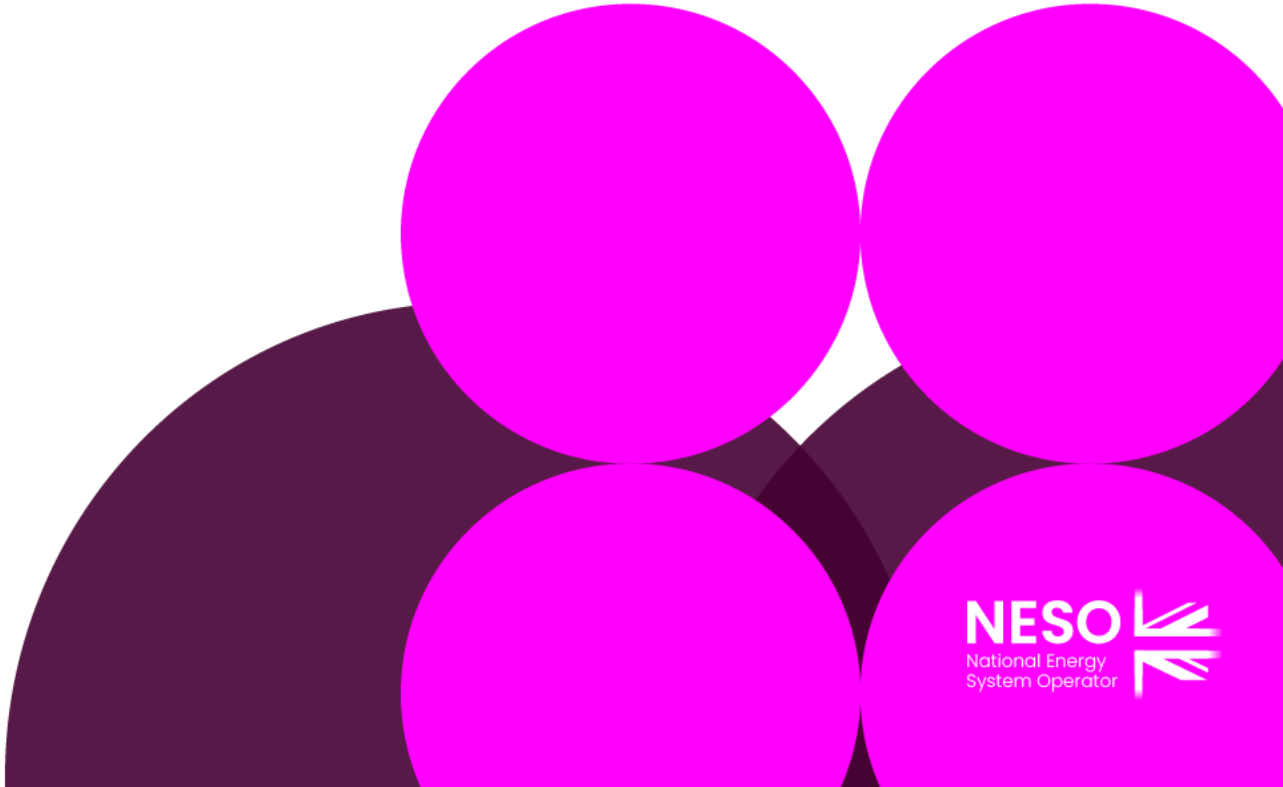
Actions

ID	Action Description	Owner
A02	Investigate whether teams can be used as an offline communication method with TAC members.	JS
A06	Work with SP and FD to organise a session with another sector.	Chair
A11	Draft 2 pages on what the ESO would like to discuss with Telecoms Organisation.	Chair
A13	Respond with any feedback on the Flexibility files distributed with the TAC-16 minutes.	All
~~A14~~	~~Organise a discussion on the TAC operation feedback between the Chair and NESO.~~	~~CS~~
A15	Feedback on the AI implementation on Digital Code Management (DCM) on the NESO website.	All

Feedback from the last meeting

Item 3

Cameron Shade



Feedback from the last meeting

Business Plan 3	Action Taken Since
• Will skip rate figures be published and tracked? • TAC attendees invited to attend webinars over December and January	• 5 webinars led with over 100 stakeholders. All feedback was considered as part of the development of the final business plan which was submit in February.

Open Balancing Platform	Action Taken Since
• OBP industry events have been a success and great to have control room personal in attendance. • TAC said to connect to everything but minimise interfaces by upfront designing. • Has OBP considered AI as an API translator?	• The control room users will continue to be included going forward. • Agreed, something we're doing as much as possible. • Helpful discussion with DoE held after last TAC. Considering next steps.

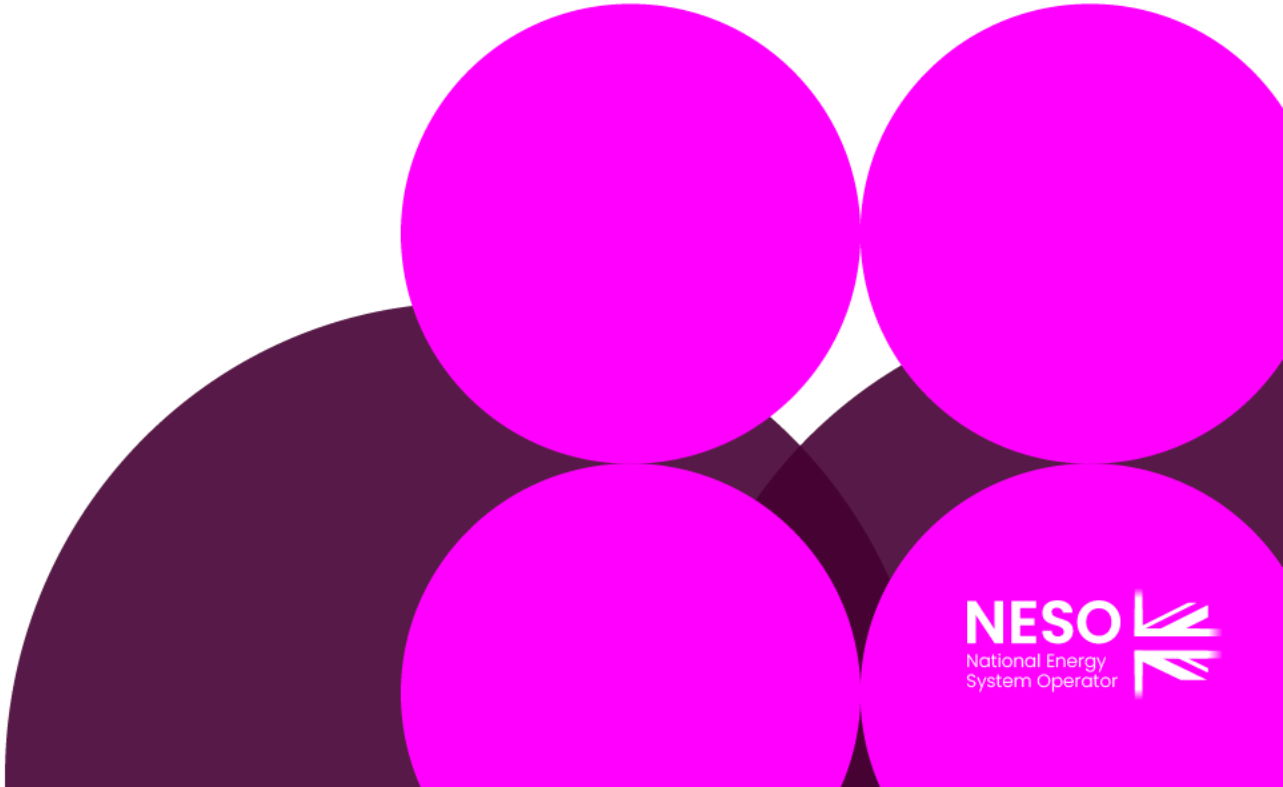
Clean power 2030	Action Taken Since
• How dependence on other parties will be handled. • Should carbon emissions be taken into consideration when prioritising?	• Clean power action plan set with actions for government, Ofgem, NESO and industry to achieve CP2030 • Clean power commission established.

AI Journey	Action Taken Since
• What is the definition of a global AI leader for NESO? • What definition of AI is NESO working to? • TAC asked whether AI translators had been considered for data sharing.	• NESO aims to use our future state as a blueprint to offer AI solutions for global adoption. Definition will evolve as we progress in FY 25. • AI definition is broad covering all techniques, from mainstream automation, ML, Computer Vision to the deeper general intelligence, advisory, robotics and cognitive capabilities. • AI translators will continue to explored.

Survey response and next steps

Item 4

Eric Brown



TAC Role

- Refresh the Terms of Reference, to emphasise:
  - The move to NESO
  - Strategic not delivery focus
  - line of sight to benefit and impact
- Circulate for review and comment with the objective of agreeing at June 2025 TAC meeting

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TAC Meetings

- Effectiveness:
  - Address the increased scope and number of topics
    - Mix of high-level reviews and deep dives
  - Pre-read material and preparation
    - Trial at March 2025 meeting
  - “Tour of the table” discussion
  - Forward agenda
  - Use of Sub-Groups (task and finish; task, pause and recall)
  - Use of Ad Hoc Groups (on demand)
  - Collaboration with other Councils

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TAC Meetings

- Organisation:
  - Frequency and schedule
    - As now (4 meetings @ 3.5 hours, first Friday of last month in quarter)
  - Format
    - 3 on-line, 1 in-person each year
  - Pre-read material and preparation
    - Trial at March 2025 meeting

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Other

- Membership review?
- Good to have a collaboration / communication capability.

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Data Sharing Infrastructure

Item 5

Simon Evans

Topics to discuss…

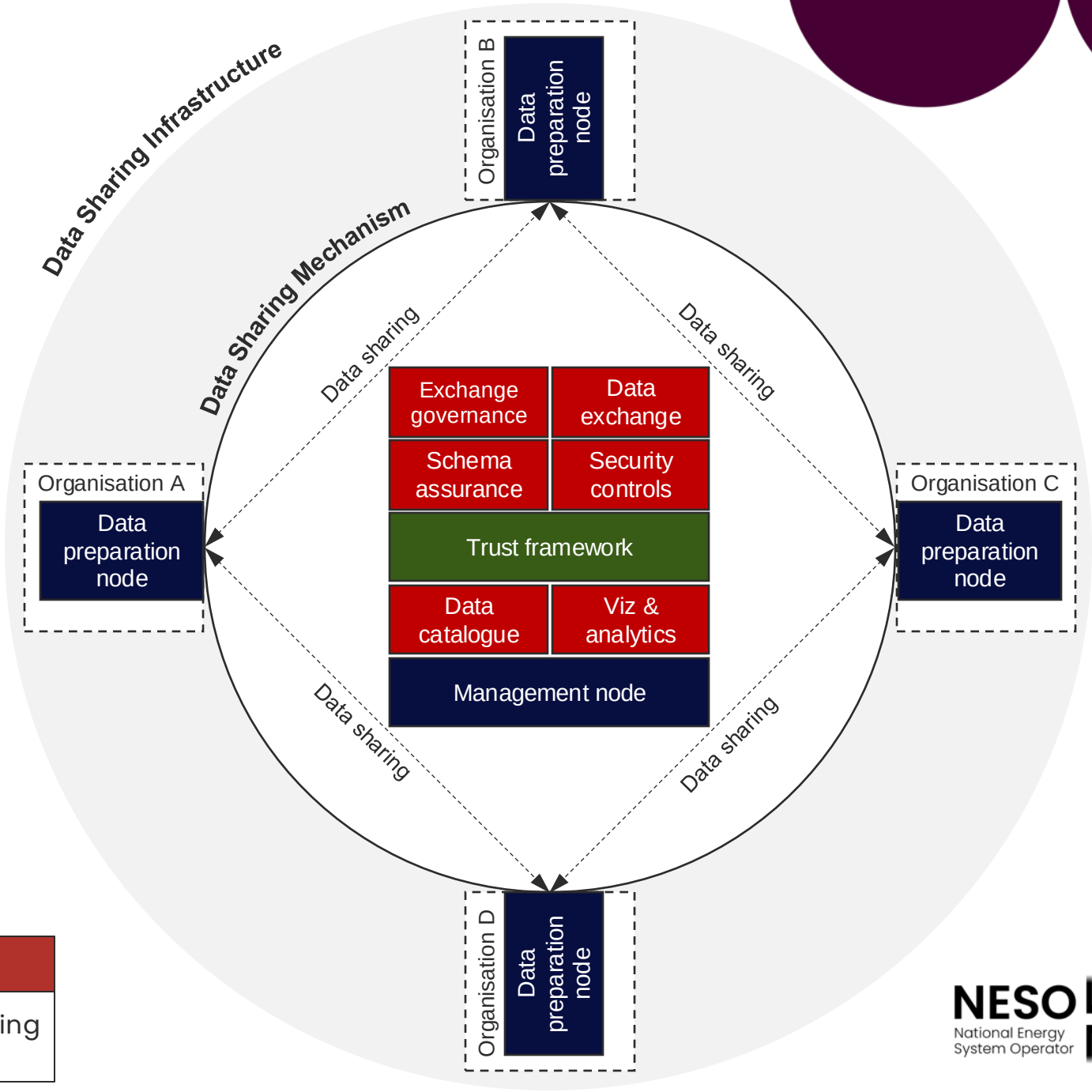
- NESO would like TAC's feedback on the overall DSI delivery and the Pilot phase

Data Sharing Infrastructure

Creating the **common data sharing infrastructure** for secure, scalable and resilient sharing of energy data and models across the sector.

Enabling a **cross-sector** ecosystem of **connected digital twins**.

Facilitating the transition to net zero.



Prepare

Cross-sector data preparation node **(DPN)**

Trust

Sector-wide trust framework

Share

Sector-wide data sharing mechanism **(DSM)**

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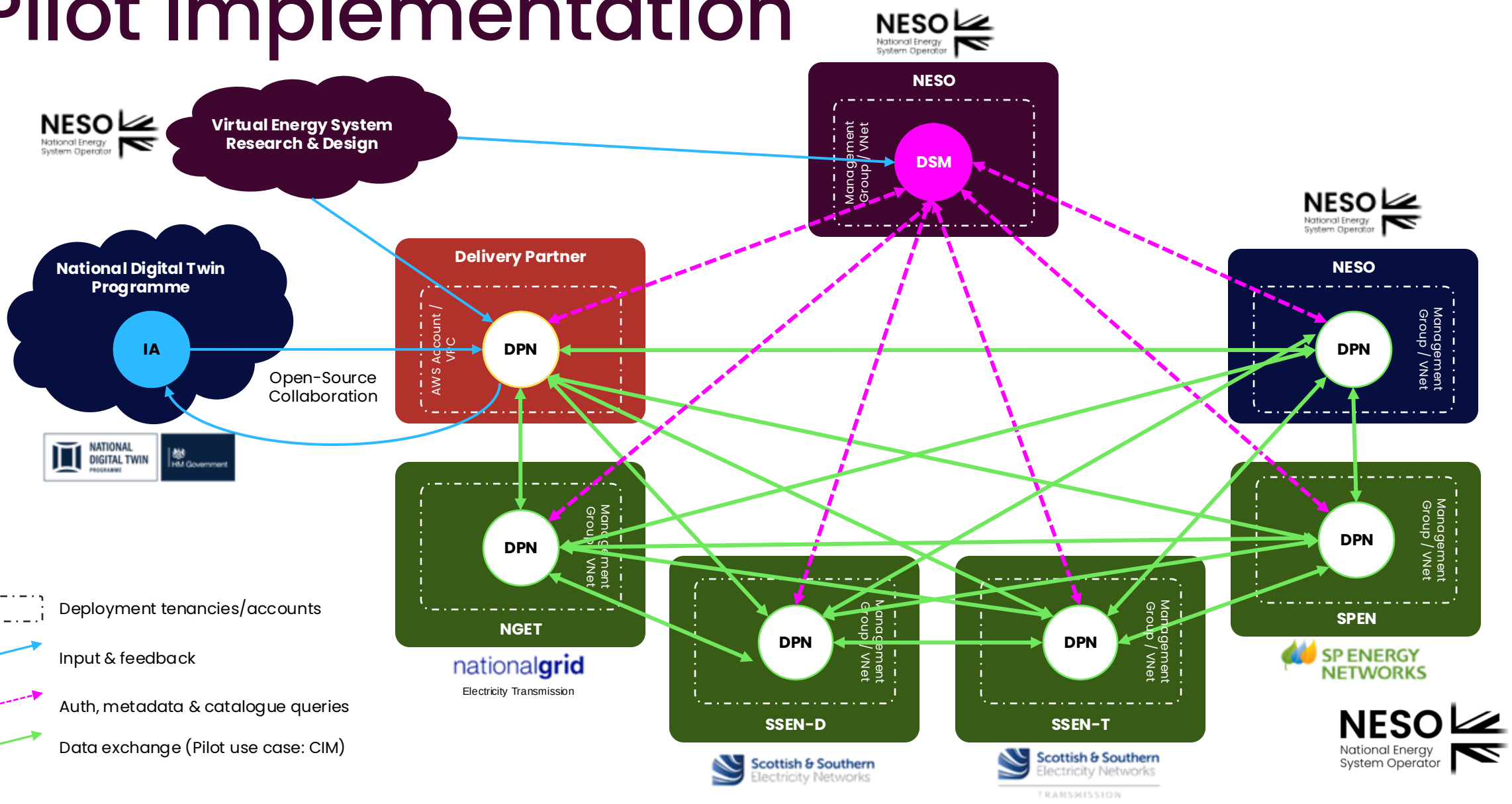
Pilot Implementation



Data Sharing Infrastructure Roadmap

Pilot

De-risk DSI design

MVP

Private beta

RIIO T3/GD3 start

Adopted by all regulated networks

For selected use cases, through RIIO3 licenses

RIIO ED3 start

Widespread adoption across sector

Used across entire value chain (generation > consumer)

2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | 2035

Horizon 1 | Horizon 2 | Horizon 3 | Horizon 4

First version of the DSI, taking desktop design into implementation

(Anchor use case: outage planning)

Functioning DSI with live initial use cases and defined SLA

(Anchor use case: strategic planning)

Public beta available and fully accessible (according to security provisions) to the sector

(Use cases created by the sector)

Sustainable operation scalable to use cases across sector

(Use cases created by the sector)

Data sharing infrastructure "maturity" and "completeness"

The functionality and capabilities of the data sharing infrastructure are developed and increase in maturity through the prioritised requirements from use cases

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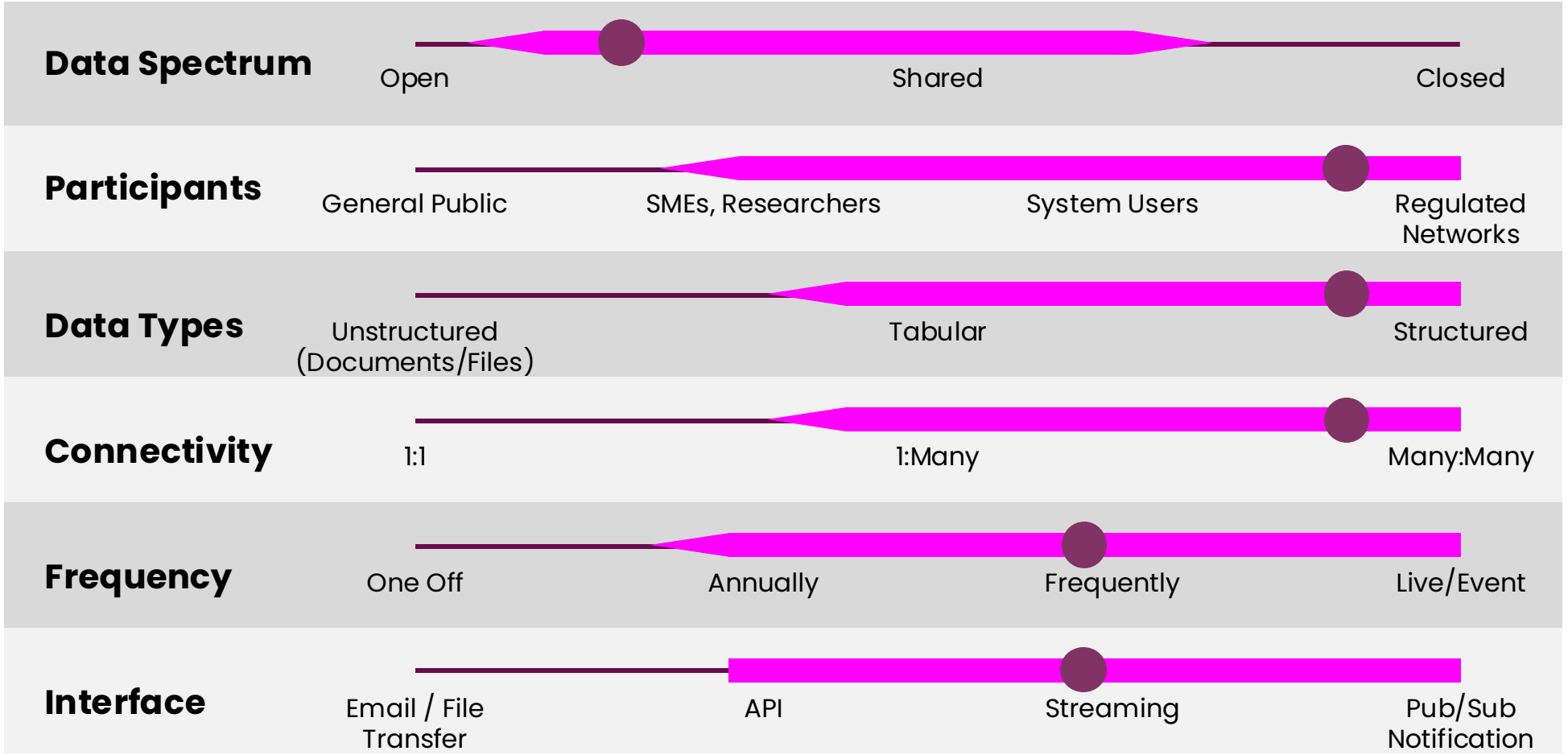
Pilot target dimensions



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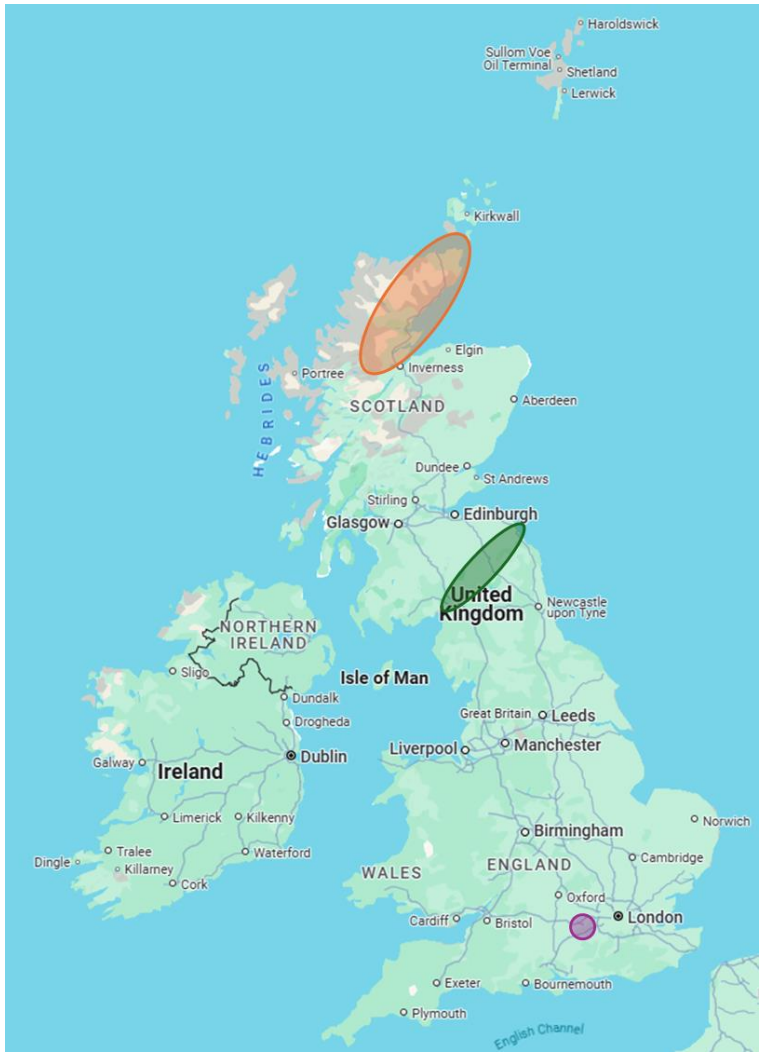
Pilot regions

We have selected sample regions for three of our pilot areas:

- **South-East of England**: **(NGET, SSEN-D): Bramley-Fleet**
- **North Scotland (SSEN-T, SSEN-D): Caithness**
- **South Scotland (SPEN-T, SPEN-D): Hawick – Berwick Ring**



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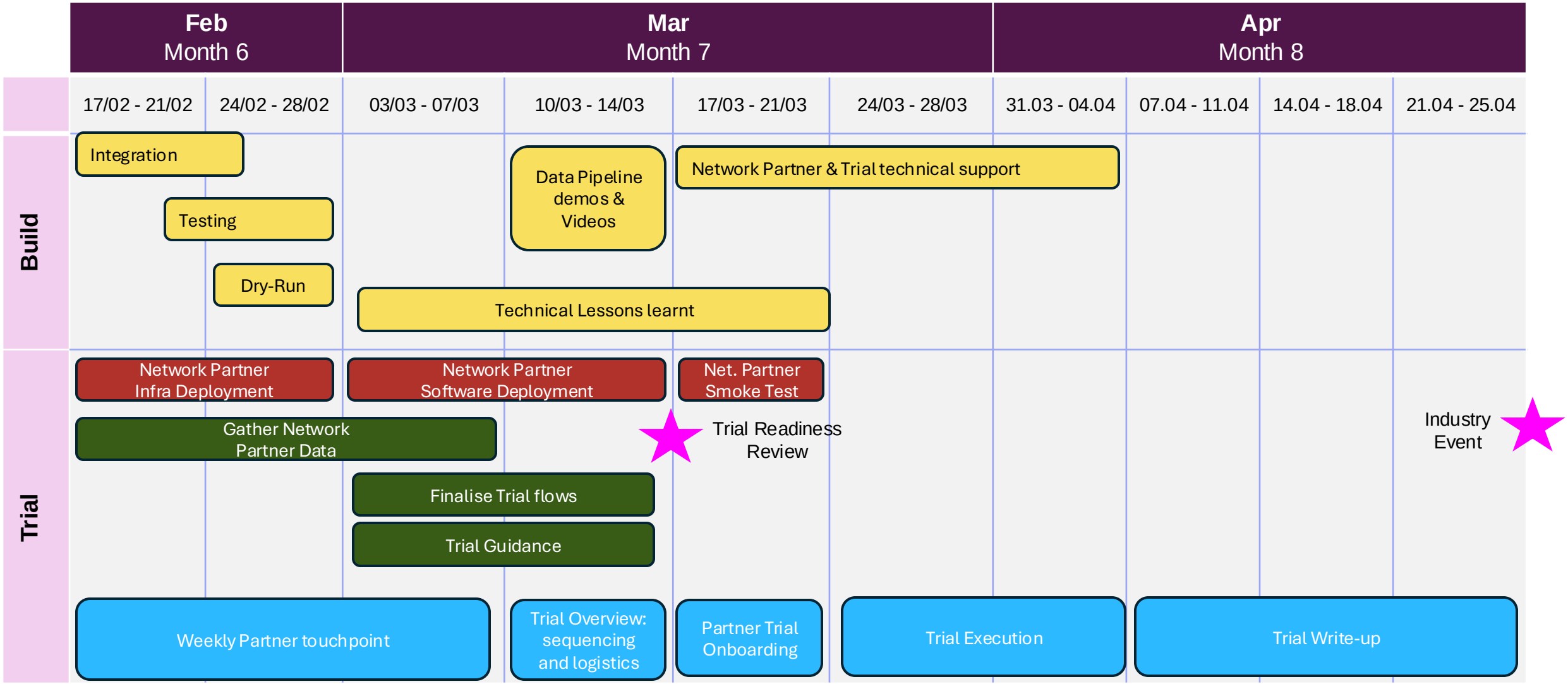
Pilot trial timelines



Key updates

Pilot

- End-to-end “dry run” successfully conducted of DSI
- Technical architecture forum (14-Jan) with pilot network partners
- Trial data prerequisites and technical readiness/preparation progressing
- Infra as Code released on GitHub repo under MIT license (https://github.com/energy-dsi)
- Engagements with NCSC/NPSA

MVP preparation

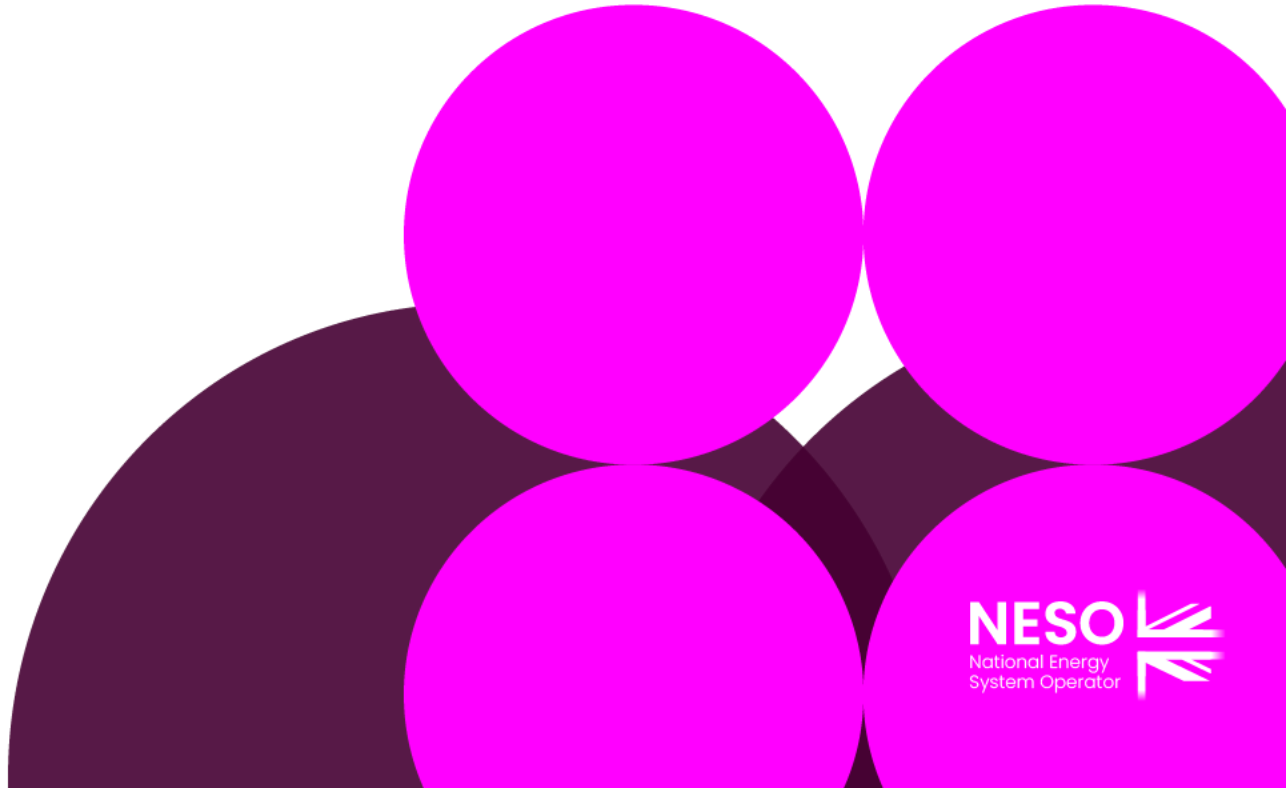
- “Anchor use case” development (electricity & gas)
- Industry codes review
- DSI business case (aligned to the HMT Greenbook OBC)

Sector Digitalisation Plan

Item 7

Carolina Tortora

Topics to discuss…



Purpose

‘Prioritised and coordinated action is needed across the sector to drive digitalisation and common governance is required for orchestration of a sector-wide digital and data plan’ – *Clean Power 2030*

Audience of power sector, specifically those developing programmes or initiatives that align with Clean Power.

This work helps identify the **gaps** between what is currently in flight, and what is required for a Clean Power System. As well as address the urgency o those initiatives.

www.neso.energy/about/innovation/sector-digitalisation-plan

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Scope and Approach

To map out the sector's current digital landscape, and determine the required future state needed to achieve decarbonisation by 2030.

Focus is on power system. Identified the biggest impact needs set forth by CP30: **Unlocking Flexibility**, **Network Planning**, and **Improved System Operations**

Relevant projects have been identified. These projects were then mapped against the capabilities required for Clean Power 2030.

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Strategic Themes set forth by CP30

1. Unlocking flexibility of demand and supply

Improving routes to market for flexibility, so more consumers can participate in and benefit from demand side flexibility.

2. Overcoming barriers to network planning

Increasing visibility of distributed energy assets and improving interoperability of data between planning mechanisms.

3. Improving systems operations

Including the digital infrastructure requirements needed to support the control rooms of the future.

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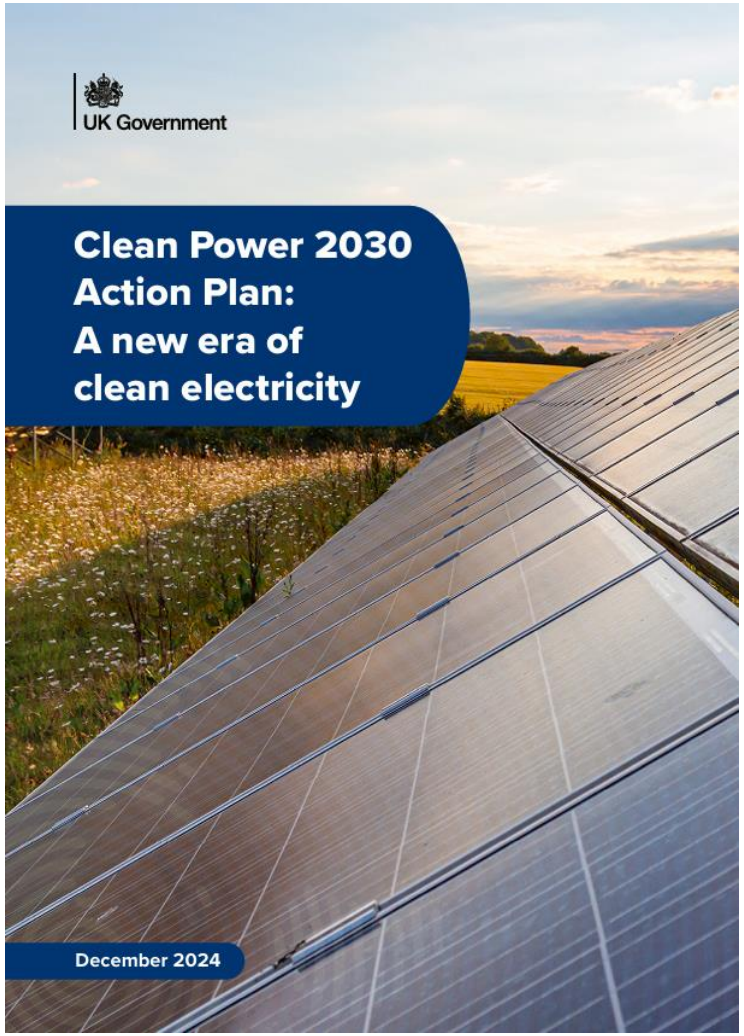
CP30 Outcomes and Link to Digitalisation



CP30 Success Criteria

Massive renewable expansion & grid enhancement

- Increase offshore wind from 15 GW to 43-50 GW
- Boost onshore wind from 16.1 GW to 27-29 GW
- Expand solar from 17.4 GW to 45-47 GW
- Upgrade transmission network, delivering 80 projects
- Build x2 as much grid in 5 years as in last decade

Energy storage, flexibility, and new technologies

- Increase battery capacity from 4 GW to 23-27 GW
- Develop 4-6 GW of long-duration storage
- Advance flexibility tech (gas CCUS, hydrogen)
- Deploy first-of-a-kind clean dispatchable technologies

Streamlined planning and market reforms

- Accelerate approval processes for clean energy projects
- Reform connection processes by 2025
- Ensure stable, attractive investment environment
- Develop flexible system for renewable integration

Massive investment and supply chain development

- Secure over £40 billion investment annually to '30
- Invest +£48 billion on top of £18 billion planned
- Ramp up supply chains and delivery momentum
- Create thousands of skilled jobs in new energy industries

Digitalisation Outcomes Needed

Consumers can participate and benefit from Demand Side Flexibility (DSF) e.g.

- Energy assets have sufficient smart functionality, are internet enabled and provide appropriate level of data granularity to enable market participation for FSPs and secondary suppliers
- FSPs can effectively coordinate millions of energy assets, because they have a clear understanding of rules, protocols and edge cases.

Enable different routes to market for flexibility e.g.

- Consumers know where their data is and can give consent easily.

Effectively coordinated planning process e.g.

- There is a single source of truth for Distributed Energy Resources, so we know where assets are installed and what type of asset they are.
- Ability to prioritise connections effectively through improved data collection and analytics.

Efficient and resilient energy system e.g.

- Provision of information and control systems to enable probabilistic operation of distributed resources.

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Summary

Summary:

- Work to date
  - High-level gap analysis phase and roadmap development
  - Royal Academy of Engineering workshop held on 05-Feb
- Aligning meetings held to ensure recommendations are consistent
  - NESO's Energy Flex project
  - DESNZ Flexibility Roadmap
  - NESO Innovation Strategy

Stakeholder engagement

- Small workshops with selected stakeholders to validate thinking
- 1-1 engagements with identified individuals or programmes

Deliverables:

- Aiming for <10 pages main report
- Publication expected date WC 21/4/2025
- Intention to identify some quick wins as part of the plan that NESO or another party can commit to for publication.

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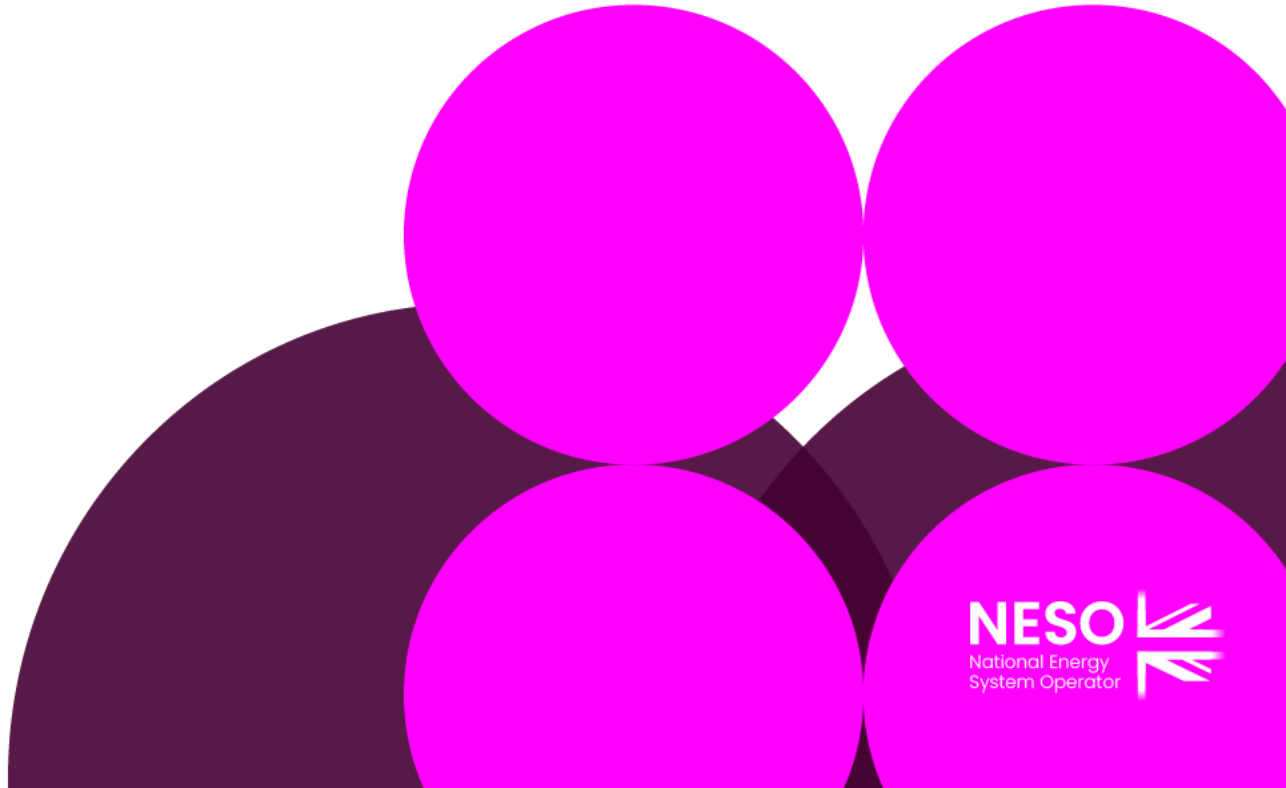
Break

10:55 – 11:10



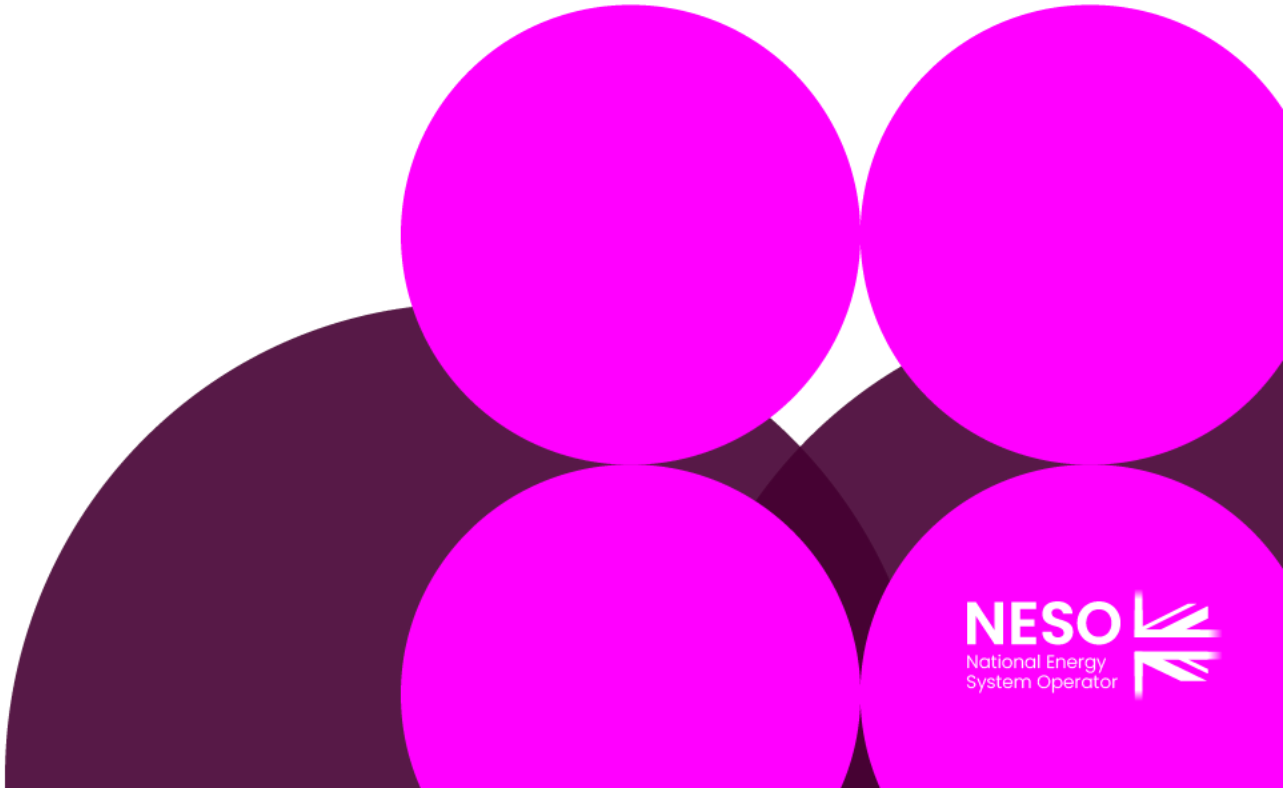
Data Programme

Item 6

Michelle Berti

Topics to discuss…

- What has been successful in rollouts of your data programme:
  - How have you embedded a data platform into your current architecture
  - How have you handled discovery of root sources of data for ingestion into your data platform
  - How have you embedded a strong data culture



Data is a fundamental enabler for NESO to carry out its purpose. We must…

Enable **decisions to be made** quickly and effectively.

Ensure a high of **trust in quality data.**

Enable opportunities to drive **innovation** and **exploit AI** to drive net zero ambitions.

Know our customers, enabling a 360 view and a tailored experience.

Trusted, accessible data is required for robust modelling and to power AI to achieve NESO and sector-wide strategic objectives

To achieve our objectives, we are operating a comprehensive data programme

Data Vision

Unlock the power of data to achieve Net Zero while maintaining Security of Supply and Affordability

Our Strategic Objectives

- **Make data trustable, accessible, and discoverable**
- **Provide modern data tools and technology**
- **Drive a data culture**

Our Strategic enablers

Make data trustable, accessible, and discoverable	Provide modern data tools and technology	Drive a data culture
Improve data quality and transparency	Provide Data and Geospatial Platforms	Provide training and professional development
Make data open and shareable	Deliver AI Enablement Platforms	Embed a data operating model
Protect data	Enable NESO with End User Tools	Foster data driven thinking

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What have we achieved to become NESO ready?

Our Strategic Objectives	Make data trustable, accessible, and discoverable	Provide modern data tools and technology	Drive a data culture
Data Programme Initiatives	• NESO ready data policies and procedures to apply Ofgem Data Best Practice • Accountable data owners • Data taxonomy to improve data quality and governance and set up cataloguing process • Data privacy and protection function in NESO	• Data and Analytics Platform (DAP) as foundation for strong data management • Interim Geospatial platform • Establishing Advanced Analytics Environments for data science	• Data Council to provide oversight of the data programme • Data professions framework and pathway • Data One Stop Shop for data literacy and services

What is on the horizon over next 12 months

Our Strategic Objectives	Make data trustable, accessible, and discoverable	Provide modern data tools and technology	Drive a data culture
Data Programme Initiatives	• Applying data controls and cataloguing critical data • Adding required data to the Data and Analytics Platform (DAP) • Applying data sharing status to share more data externally • Embedding data roles and responsibilites through training	• Single user experience and democratised analytic tooling • Strategic Data Quality Tooling • Data Catalogue to enable data discovery and transparency • Improved Open Data Portal	• Continued professional training for NESO colleagues • Data storytelling campaign to embed data best practice • Data literacy programme to expand data skills across NESO • Communities of Practice for Data

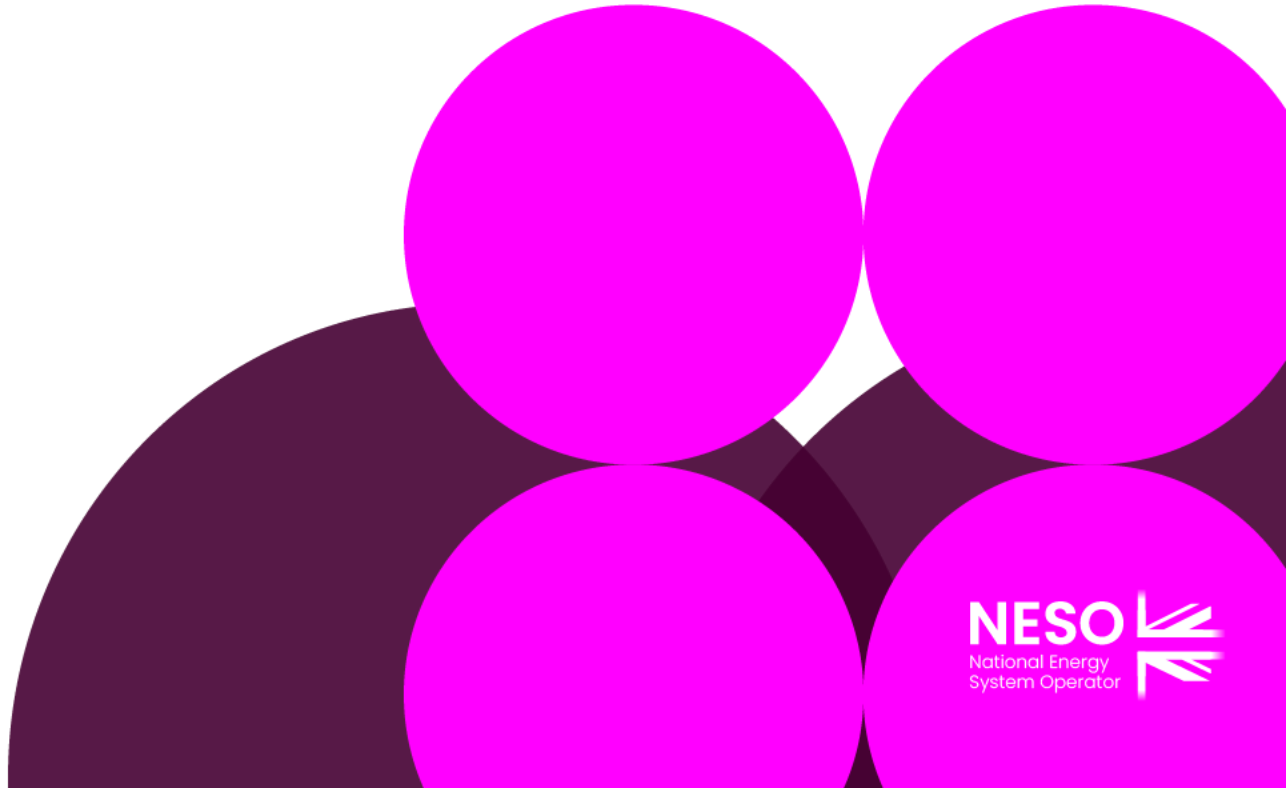
Open Balancing Platform Update

Item 8

Brendan Lyons

Topics to discuss…

- Update on OBP Roadmap



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

Current – March 2025

System

EFS

Platform for Energy Forecasting (PEF)

BM

- Scheduling
- Constraint management
- National Optimisation
- Electronic Dispatch & Logging (EDL) / Electronic Data Transfer (EDT)
- Manual instructions

Open Balancing Platform (OBP Lite)

- Bulk dispatch / Fast Dispatch
- Interface to Single Markets Platform, Integrated Energy Management System, & Data Analytics Platform (DAP)
- Balancing Reserve
- BM Quick Reserve

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

December 2025

System

EFS

PEF

BM

15% of SORT functionality
60% of SPICE functionality

Fully Resilient OBP

85% of SORT functionality
40% of SPICE functionality

Including:

- Constraints
- National Optimisation
- Manual instructions
- EDL/EDT Mastering
- BM & Non-BM response & reserve services
- PEF integration
- New storage parameters

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
- No IT system or market downtime

Learn more about where we are in our balancing & forecasting transformation journey in this **video**.

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Progress Since November 2024

New IT system:

- **Dispatch Efficiency Monitor**

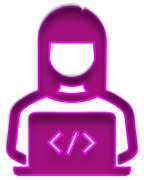
Deliverable: Ability to monitor dispatch efficiency in near real-time

Benefit: Real time data on instructed dispatch visible to the control room desks

What does this mean for you? Improvements in economic dispatch; this new monitor has enabled the reporting of skip rate data on the NESO website, using the published LCP methodology – you can access the skip rate data here.

Current Systems:

- **VERsatile Graphical Instruction Logger (VERGIL)**



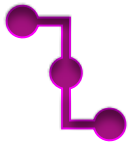
Deliverable: Features to enhance visibility and navigation for managing constraints and improve the automatic extension of manually created BOAs.

Benefit: Ease of use coupled with better situational awareness for control room engineers

What does this mean for you? Supports improved economic dispatch

Open Balancing Platform:

- **Data Analytics Platform (DAP)**



Deliverable: Interface created between DAP and OBP; DAP is a new platform providing NESO with advanced analytic tools to monitor actions taken in the control room.

Benefit: The connection of OBP data into DAP provides a long-term solution to store and make available key data related to unit selection to ensure compliance with external audit requirements and dispatch transparency

What does this mean for you?: Enables future developments to support faster response times to questions and queries, and greater transparency via the data portal.

Open Balancing Platform:

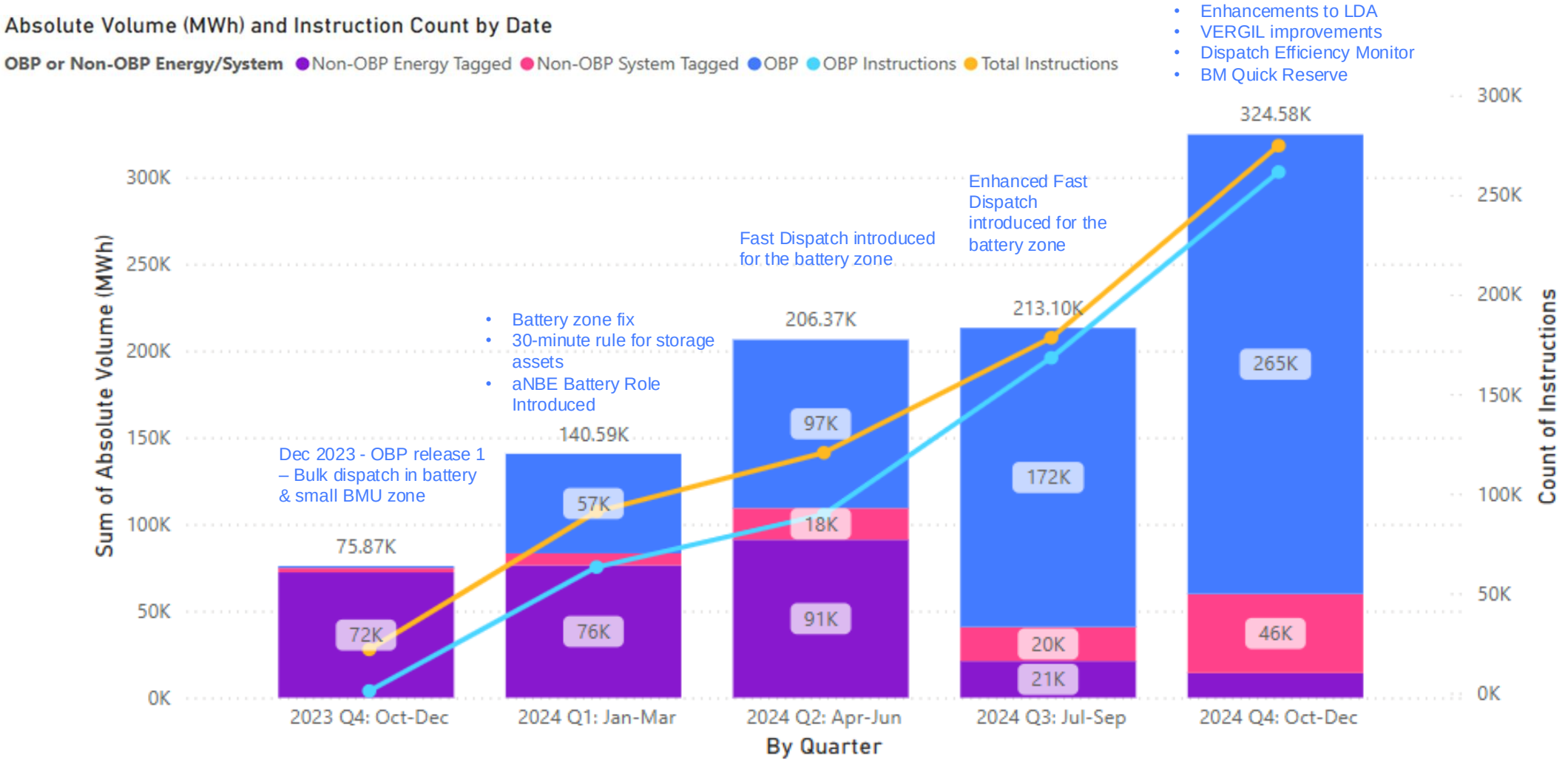
- **Phase 1 of the new Quick Reserve (QR) service (Business Go Live)**

Deliverable: This new service is part of the suite of services being introduced by NESO to improve our existing response services – QR is responsible for reacting to pre-fault disturbances. Delivery of the full service (Phase 2) will take place in Summer 2025.

Benefit: Potential to deliver consumer savings in the region of £29-£32 million each year.

What does this mean for you?: Further commercial opportunities for assets with the correct parameters.

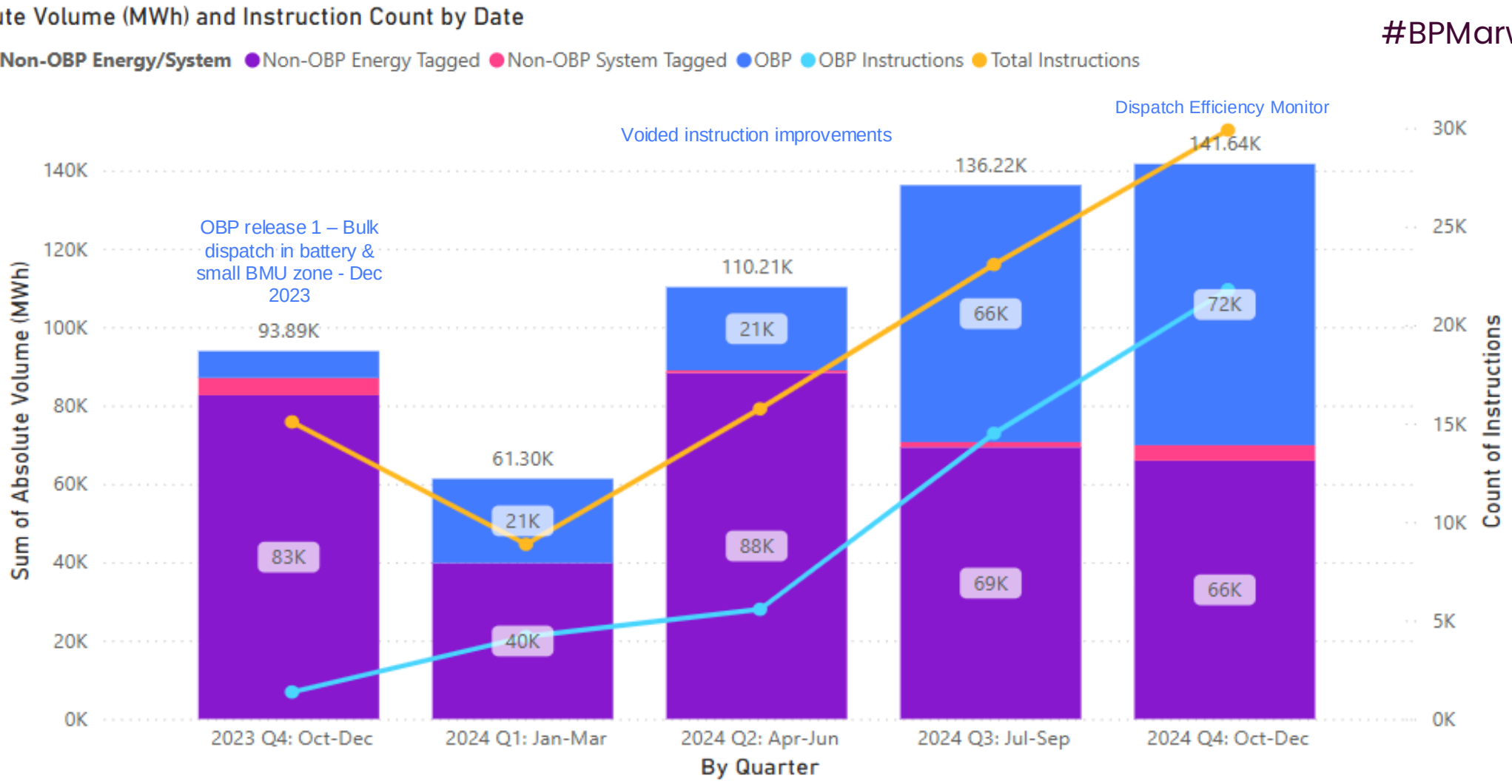
Battery Utilisation Statistics



Comparing 3 months before OBP went live to the latest period - 01 October to 31 December. We observe the absolute volume per quarter (MWh) of Batteries in the BM has increased from 75.87 to 324.58 (328% increase). The number of quarterly instructions has increased from 21,875 to 274,715 (1,156% increase).

Small BMU Utilisation Statistics

#BPMarwebinar25



Comparing 3 months before OBP went live to the latest period - 01 October to 31 December. We observe the absolute volume per quarter (MWh) of Small BMUs in the BM has increased from 93.89 to 141.64 (51% increase). The number of quarterly instructions has increased from 15082 to 29896 (98% increase).

Balancing Systems Release Plan

Key:
- Complete
- Moved to a later date (no. of quarters moved)
- Moved to an earlier date (no. of quarters moved) OR New
- No change
- **PI:** Programme Increment

PI 14 (Oct 24 - Jan 25)

OBP Capabilities & Enablers:
1. Interface to **Data Analytics Platform** (DAP)
2. **BM Quick Reserve** Business Go-Live

Non-OBP Capabilities:
1. **ASDP System** – Final release
2. **BM System** – Legacy Dispatch Algorithm updates (NEW)
3. **VERGIL** – addition to improve economic dispatch (NEW)
4. **Dispatch Efficiency Monitor** – real-time monitor (NEW)

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

PI 16 (Apr 25 - Jul 25)

OBP Capabilities:
1. Non-BM Instruction Types
2. Non-BM Quick Reserve
3. National Optimiser
4. Pumped Storage BOAs (+1)
5. Bulk Dispatch Wind BMUs (rule based) (+1)

PI 18 (Oct 25 - Jan26)

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

OBP Enablers:
1. Ready to decommission ASDP
2. EDT/EDL mastered from OBP (+1)
3. PEF Integration (+2)

Retire ASDP, VERGIL & CLOGS

PI 15 (Jan 25 - Apr 25)

OBP Capabilities:
1. Constraint Management
2. Manual instructions (+1)

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

PI 17 (Jul 25 - Oct 25)

OBP Capabilities:
1. BM & Non-BM Slow Reserve
2. Move MW Dispatch
3. Move Response (DC/DM/DR)
4. Optimisation within a Constraint (+1)

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

PI1 9 (Jan 26 - Apr 26)

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

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

Changes to the Balancing Systems Release Plan

Non-BM APIs: Brought forward from our original date in June to allow for external testing in April 2025.

PEF integration: To avoid extra work for network configuration, and to save costs, we will delay connecting OBP to PEF until PEF has moved from National Grid azure tenancy to NESO azure tenancy. This does not affect the business case because wind forecasts are still available on the existing system and can be transferred from there.

OBP becomes operationally critical: Moving from National Grid to NESO networks involves extra work. We have re-baselined our plans to allow for extra testing.

EDT/EDL mastered from OBP: Development work on the new versions of EDT and EDL is almost complete but mastering from OBP depends on OBP becoming operationally critical. This work cannot complete until OBP moves to a fully resilient solution and only after a period of stability where we can complete testing different hardware configurations. By following this path, we minimise disruption to external parties.

Manual Instructions: Work to improve economic dispatch and enable Quick Reserve has been prioritised delaying the go-live for this capability. We are training control room users now and expect go-live to be in March 2025.

Pumped Storage BOAs/Bulk Dispatch of Wind (Rule Based): Pumped Storage BOAs and Bulk Dispatch Wind (Rule Based) depends on Manual Instructions and so these capabilities been delayed until this is complete.

Optimisation within a Constraint: Optimisation within a constraint is dependent on developing rules for Pumped Storage and Wind units and so is delayed until dispatch of these unit types has been migrated to OBP.

Skip Rate Definitions

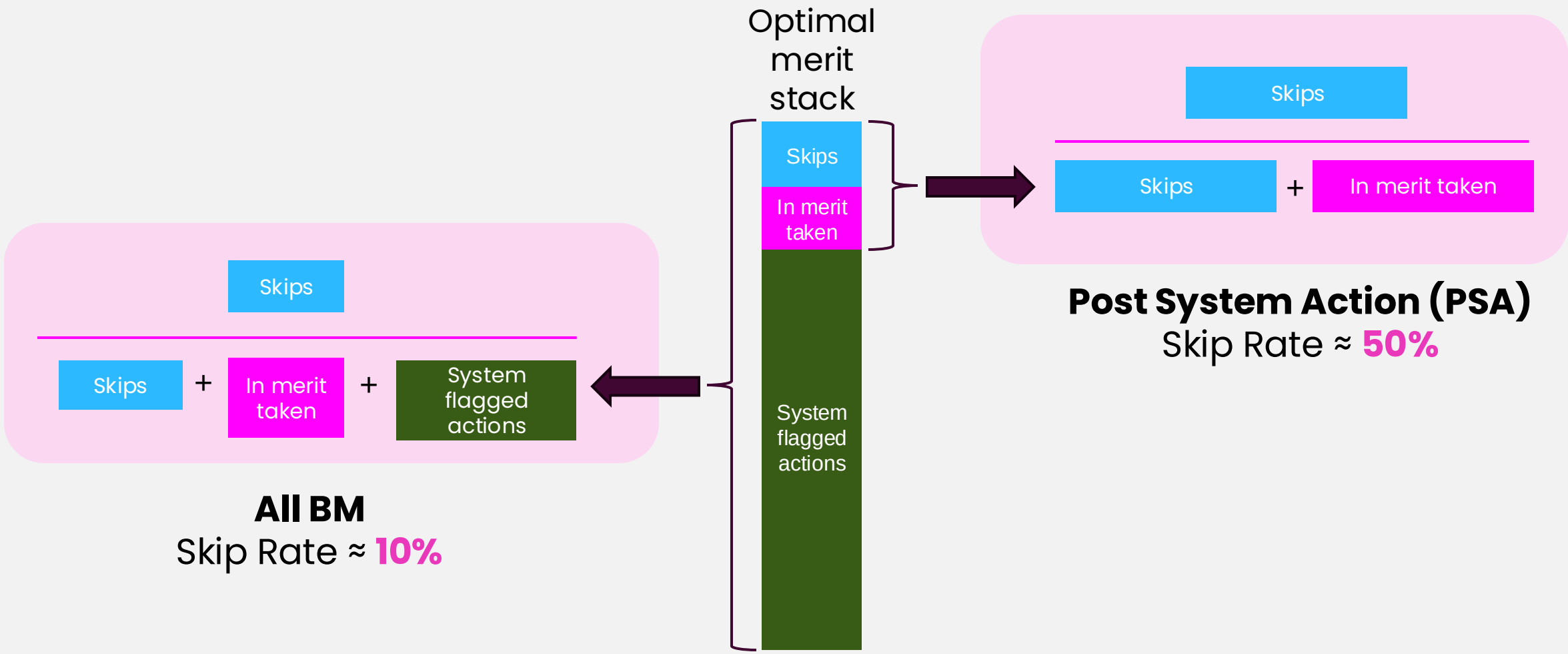
All Balancing Mechanism (BM) Skip Rate

A measure of skips, taking into consideration all BM actions we could have taken over the relevant period.

Post System Actions Skip Rate

A more targeted measure of skips; this measure disregards actions taken for system reasons.

Skip Rate Definitions



Public

Skip Rates

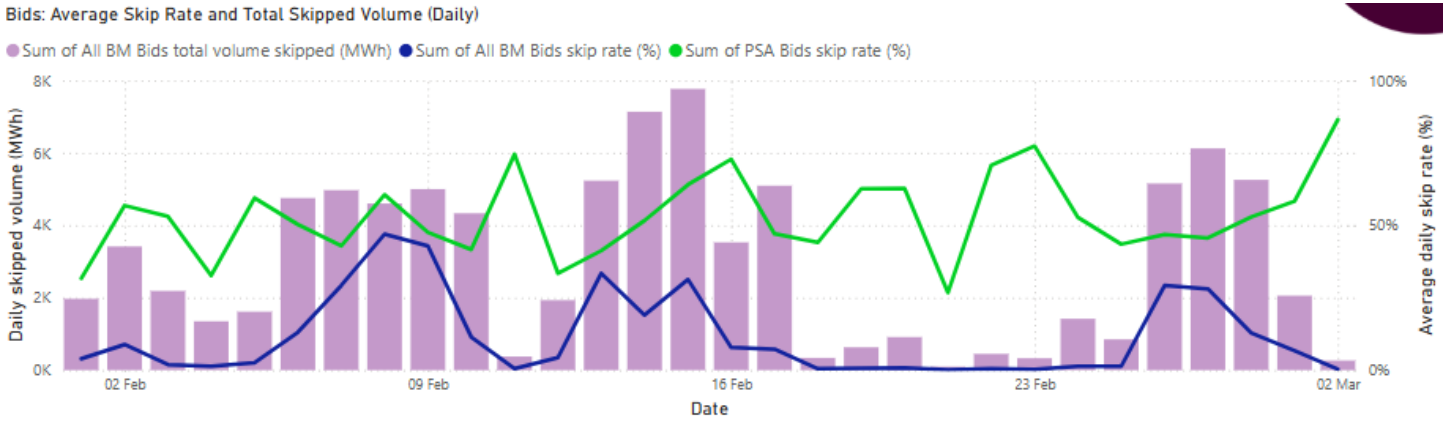
We are hosting a drop-in session to discuss the methodology & datasets on 12th March – please register here.

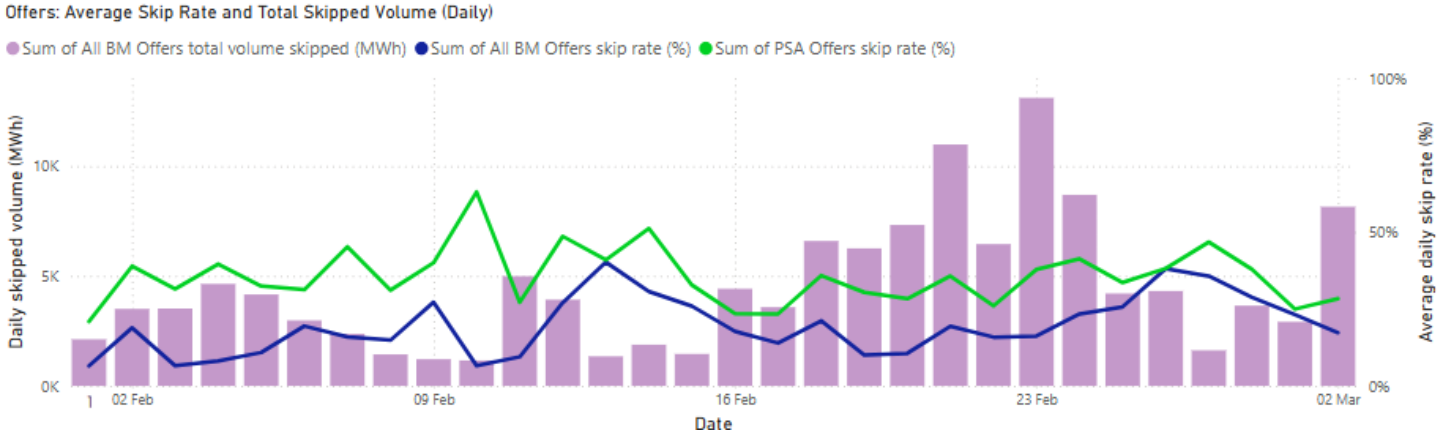
Slido code #OTF

We are now sharing the summary skip rate data on a rolling 4-week basis. We welcome your comments on if you find this valuable and feedback on how we present this data.

Weekly Average w/e	Offers - All BM	Offers - PSA	Bids - All BM	Bids - PSA
09/02	11%	35%	7%	49%
16/02	15%	33%	11%	50%
23/02	15%	32%	1%	51%
02/03	24%	34%	6%	49%

Monthly Average	Offers - All BM	Offers - PSA	Bids - All BM	Bids - PSA
January	18%	34%	11%	53%
February	15%	33%	5%	49%





Key Insights

2nd Mar: Low All BM bid skip rate and skipped volume, but high PSA bid skip rate – difference due to a high volume of system tagged actions and a low volume of energy actions.
w/e 02/03: Higher All BM offer skip rate (24%) than previous weeks due to less system actions. PSA offer skip rate is in line with previous weeks.

Note: due to size issues, both 'In Merit' datasets now have a separate file for each month. Based on feedback we intend to maintain this method of publishing the data.

Skip rate data and more info on skip rates and battery storage including methodology.

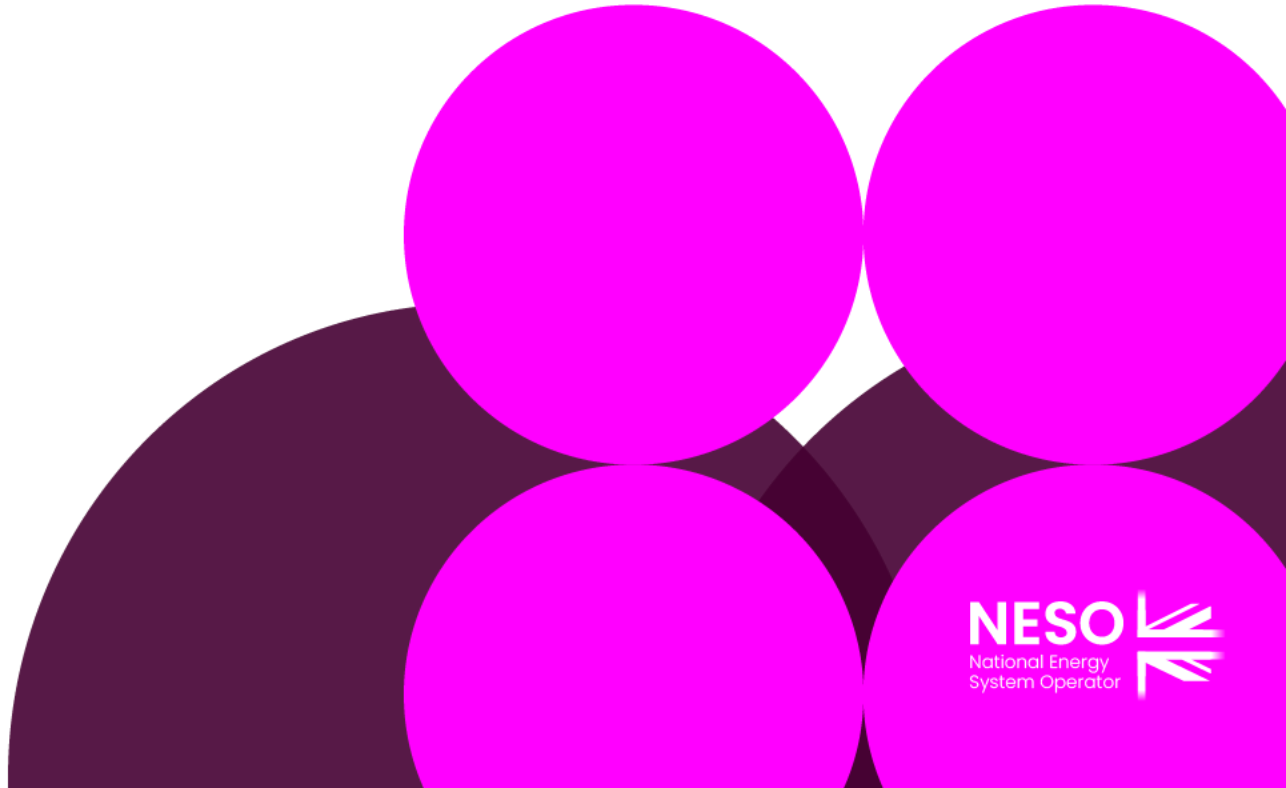
PSA: Post System Action

NESO National Energy System Operator

Subgroups update

Item 9

Cameron Shade



Subgroups update

Digital and Data Strategy held 10th January

- Data Catalogue
- Location Intelligence

- Next meeting 11th April 2025.

Control Room of the Future held 25th February

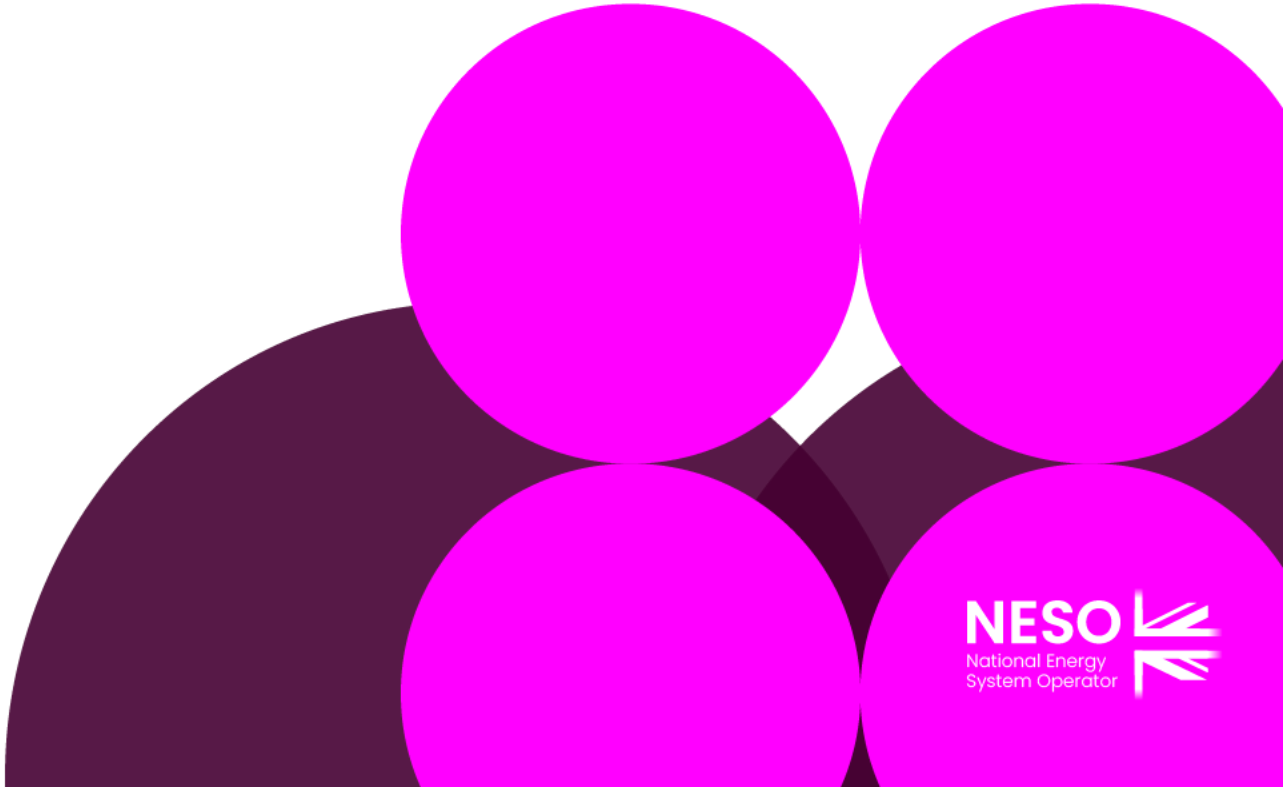
- Update on operational capability transformation.

- Next meeting date expected end of May TBC.

Next meeting

Item 10

Eric Brown



Next meeting

Meetings are every quarter for a half-day on the first Friday morning of the month, 9am-12.30pm.

- 6th June 2025

AOB

Item 11

Eric Brown