Public

ESO Technology Advisory Council

TAC-17 6th December 2024

Meeting pack

NESO
National Energy System Operator

TAC-17 agenda – 6th December 2024

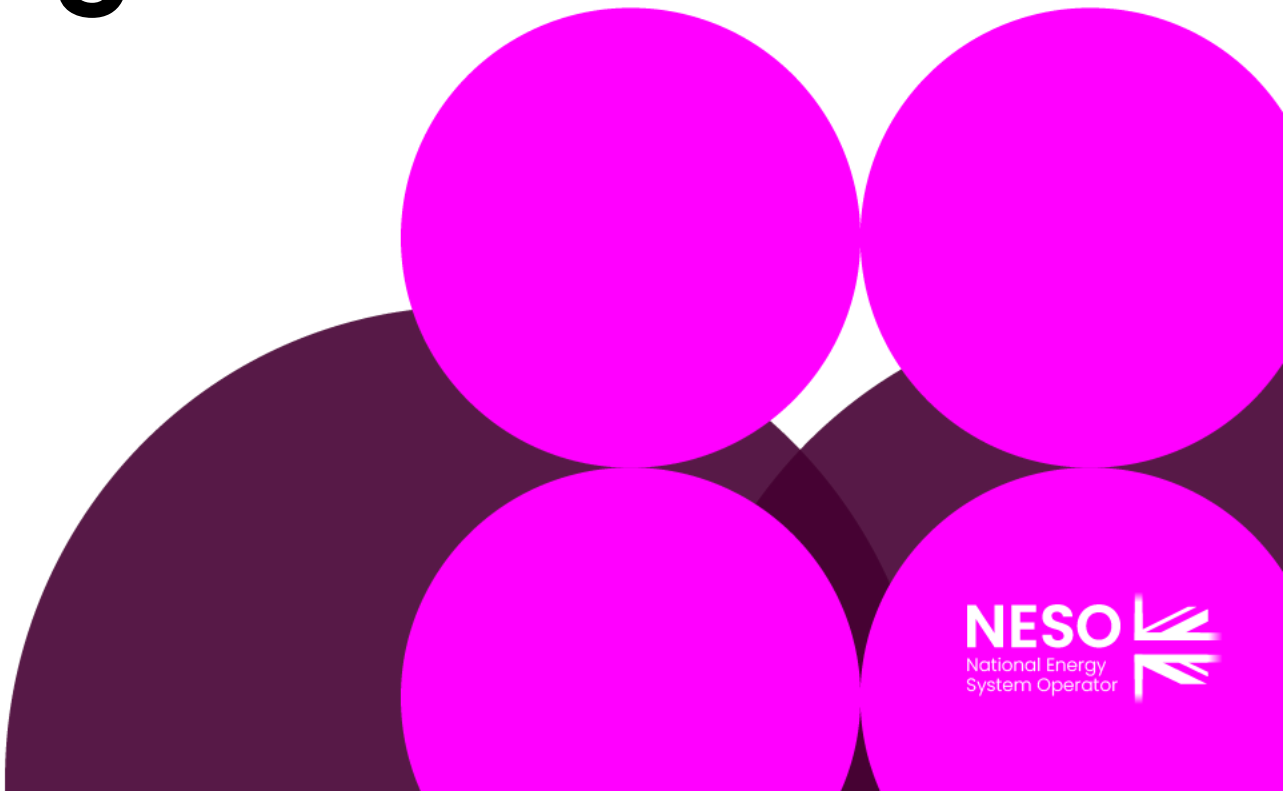
Item	Start	Finish	Time	Item	Presenter	Notes
1	9:00	09:10	10	**Welcome & Apologies**	Eric Brown	
2	09:10	09:20	10	**Minutes of last meeting and matters arising**	Eric Brown	
3	09:20	09:35	15	**Feedback from the last meeting**	Cameron Shade	
4	9:35	10:00	25	**TAC Role and Operation**	Eric Brown	
5	10:00	10:10	10	**Business plan 3**	Rachel Smith	
6	10:10	10:35	25	**Open Balancing Platform Update**	Bernie Dolan	
	10:35	10:50	15	**BREAK**		
7	10:50	11:30	40	**Clean Power 2030**	Jonathan Barcroft	
8	11:30	12:00	30	**AI Journey**	Carolina Tortora	
9	12:00	12:10	10	**Subgroups update**	Cameron Shade	
10	12:10	12:20	10	**Next meeting**	Eric Brown	Next meeting: Friday 7th March 2024
11	12:20	12:30	10	**AOB**	Eric Brown	

National Energy System Operator

Welcome and apologies

Item 1

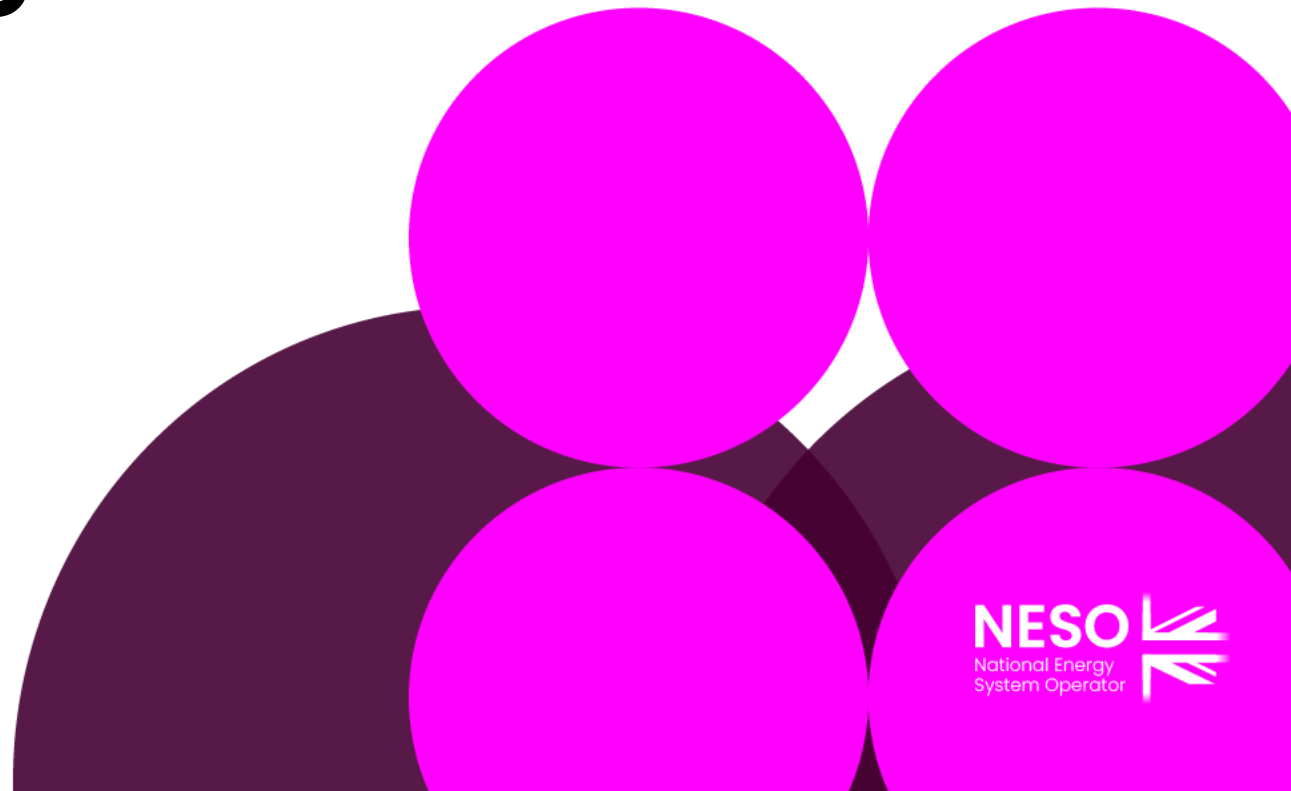
Eric Brown



Minutes of last meeting and matters arising

Item 2

Eric Brown



Minutes of last meeting and matters arising

- Minutes of TAC-16 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.

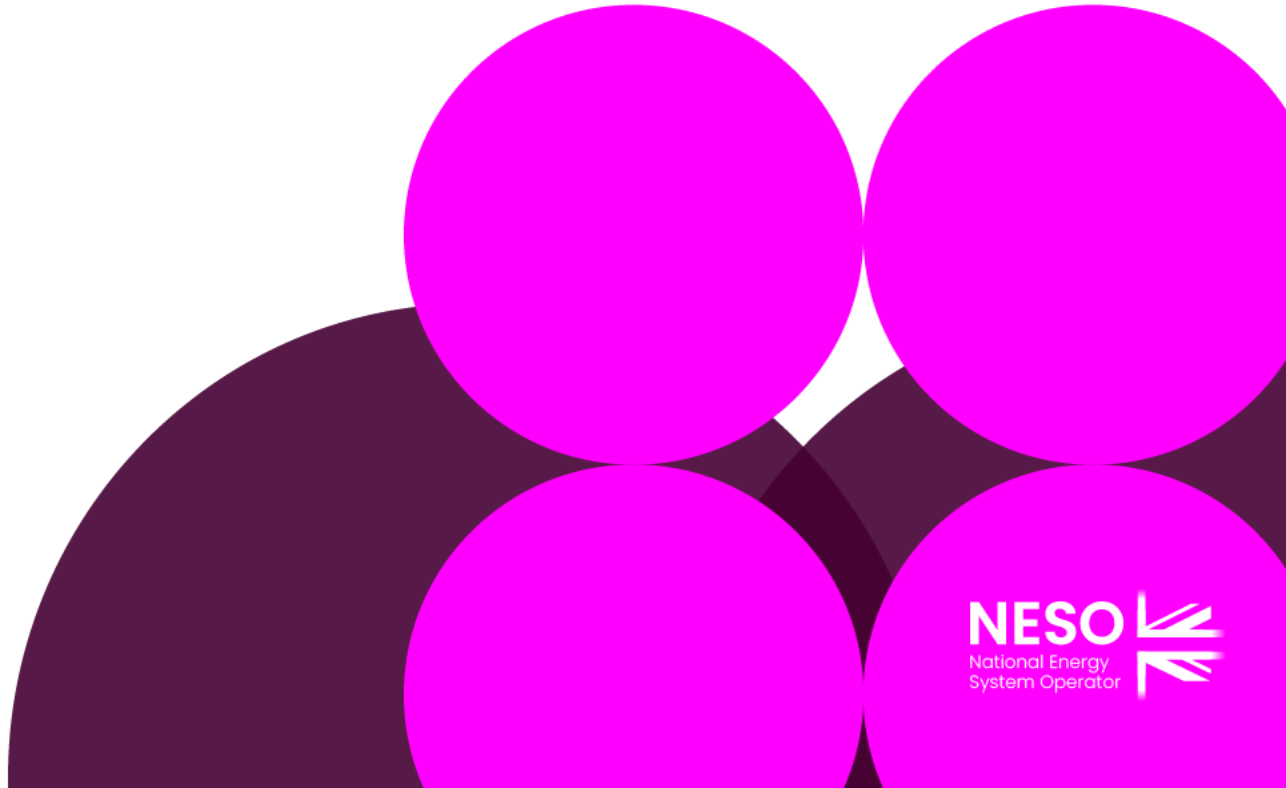
Actions

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
A09	Ask for OBP topics TAC would be interested in seeing in the future.	CS
A11	Draft 2 pages on what the ESO would like to discuss with Telecoms director.	EB / SR / JS / CS
~~A12~~	~~Survey members for preferences on future meetings.~~	~~CS~~

Feedback from the last meeting

Item 3

Cameron Shade



Feedback from the last meeting

Flexibility	Action Taken Since
• Making the best use of renewables should be a marker for success. • Review the Australian market who area 5 minute balanced. • Ask to review embedded spreadsheet and feedback.	• This is being included as a measure of success going forward • Passed the feedback onto REMA to consider • Feedback has been received, any further responses are welcome

Strategic Energy Planning	Action Taken Since
• Lifetime sanctioning will limit the way of working due to the lengthy process. • Are there any changes as a result of CP30?	• Presentation refined to cause less confusion as sanctioning was not impeding progress. • CP30 will be used as a baseline for the next reports. Further CP30 work progressing in parallel.

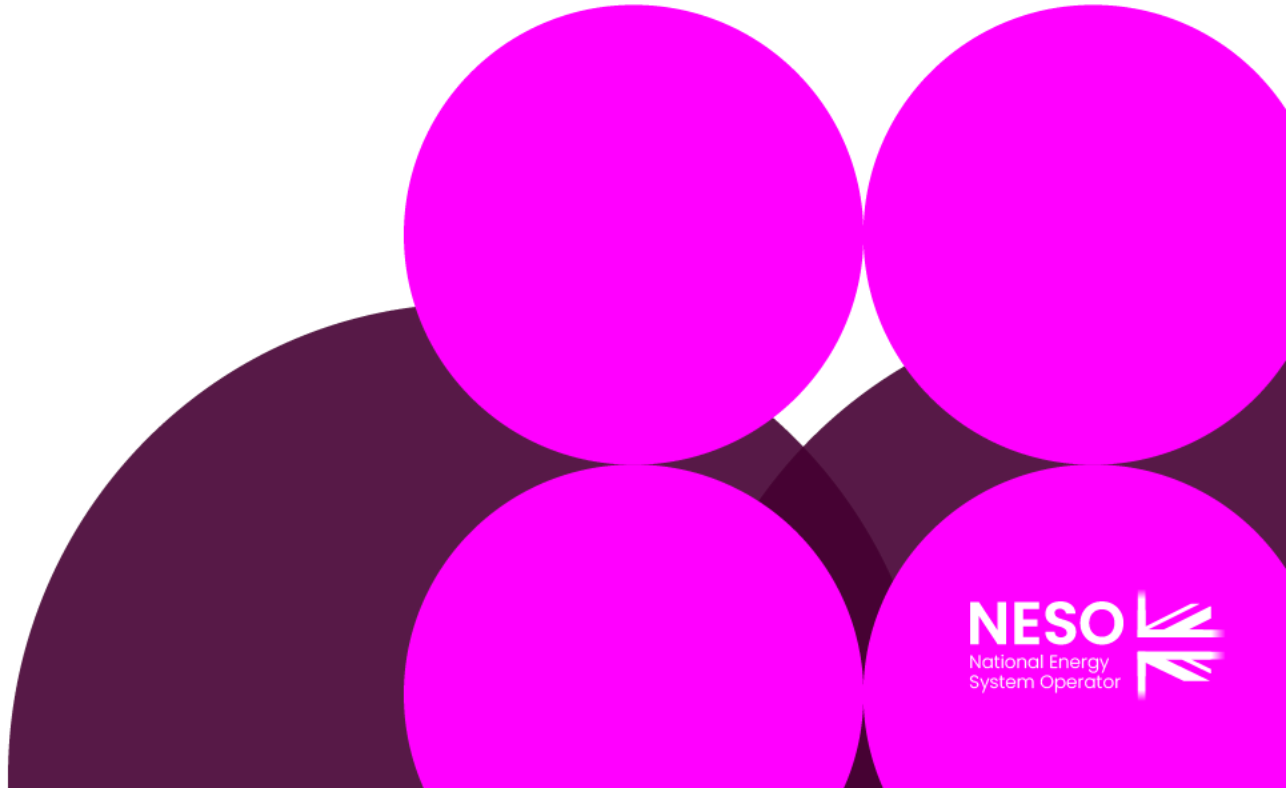
FSO Day 1 to Day 2	Action Taken Since
• Is the right level of governance in place over architectural decisions? • Digitalisation needs to take into account the next generation of workforce not todays	• NESO architectural governance includes the Design Architecture Forum and Design Authority. During the TSA period the Joint Design Authority to assure technology designs as part of separation. • NESO are ensuring that optimising user experience is one of the key outcomes in designing our future-facing technology capabilities.

Data Sharing Infrastructure	Action Taken Since
• This needs to be a sector wide approach focused on digitalisation work that is on going. • Have any other countries already undertaken this? • Consider this through the lens of the consumer and what lessons can be learn from other industries on how to engage.	• In prep for the MVP we're actively engaging with the wider regulated networks and industry to get input/feedback and explore use cases. • The EU "data spaces" is considering similar concepts and are exploring future collaboration. • Engaging with RECCO on consumer consent, and with other orgs that are closer to consumers in energy to explore this.

TAC Role and Operation

Item 4

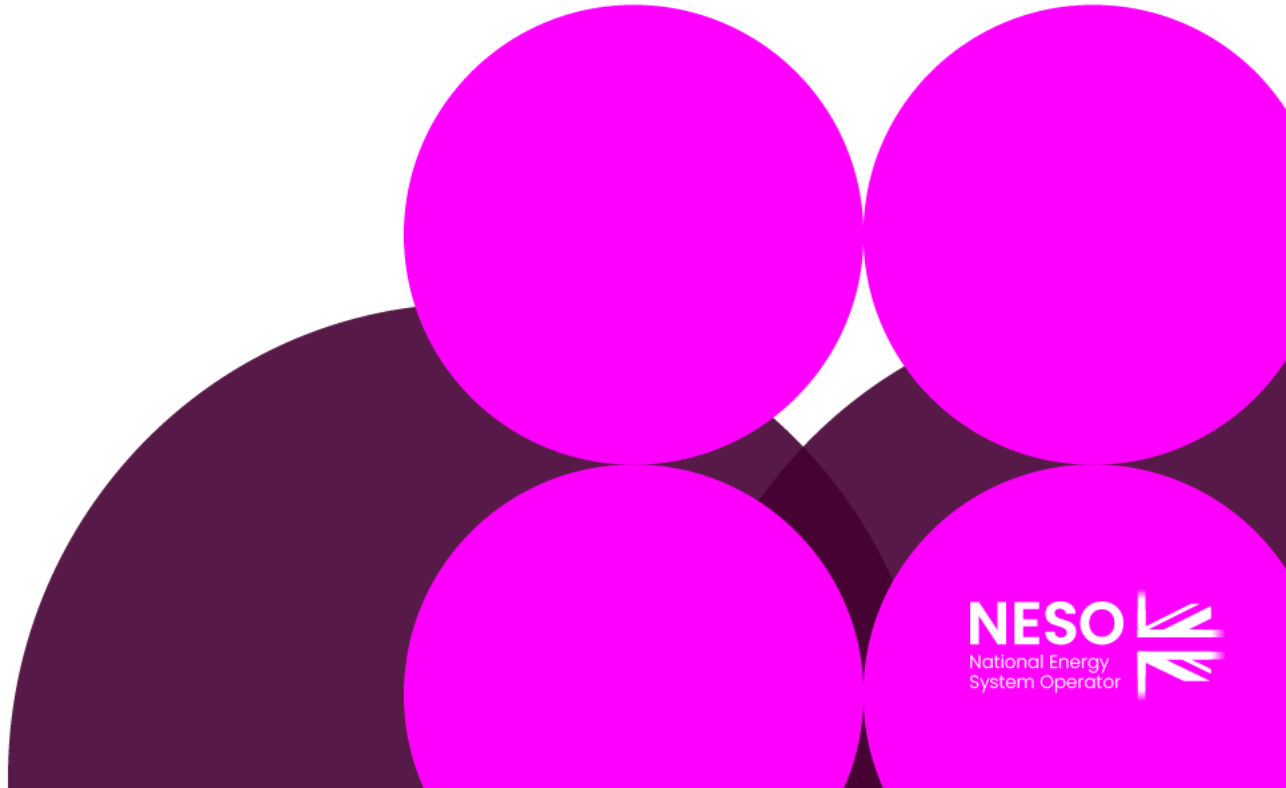
Eric Brown



Business plan 3

Item 5

Rachel Smith



What is BP3?

Business Plan 3 (BP3) April 2025 – March 2026

BP3 will be our first business plan as NESO

BP3 will be less granular than the previous RIIO-2 plans

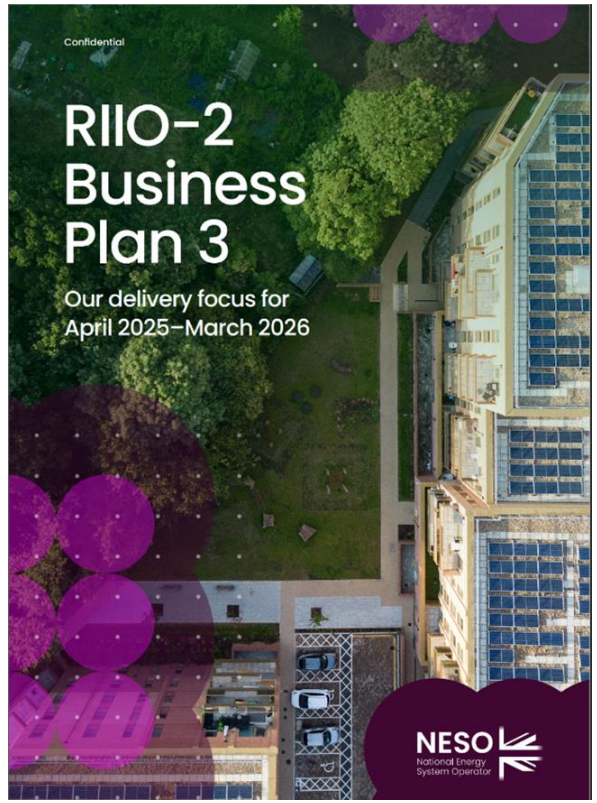
Sets out our Strategic Priorities and proposed high level Performance Objectives for the period, costs for delivery, and how we will measure success

Plan aligns to the Business Planning Guidance published by Ofgem in November 24

BP3 is built on the publication of our 'Introduction NESO' Day 1 Document

Developed alongside our budget

RIIO-2				
2021-22	2022-23	2023-24	2024-25	2025-26
BP1		BP2		BP3



Strategic Priorities

Our ‘Clean Power’, ‘Decarbonised Energy’ and ‘Consumer Value’ priorities describe holistically ***what*** we will deliver before April 2026.

Clean Power
We will enable a zero-carbon electricity system by adopting a whole system approach, encouraging innovation and collaboration.

Decarbonised Energy
We will develop integrated plans for a decarbonised, efficient and flexible energy system fit for the future.

Consumer Value
We will have unlocked around £3 billion of consumer benefits by 2026 through delivery of our commitments.

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Strategic Priorities

Our ‘Digital Mindset’, ‘Customer Centricity’ and ‘People Value’ priorities describe holistically ***how*** we will deliver before April 2026.

Digital Mindset
We will unlock the potential of technology and teamwork through a digital-first approach, enabling a future of seamless connectivity and innovation at pace.

Customer Centricity
We will understand and balance the different needs of our customers to form meaningful partnerships.

People Value
We will invest in our people to ensure we’re prepared and empowered to embrace the opportunities of the future.

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Our BP3 Performance Objectives

Clean Power 2030 Implementation

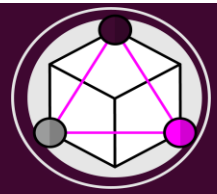
Strategic Whole Energy Plans

Connections Reform

Fit-for-Purpose Markets

Secure and Resilient Energy Systems

Operating the Electricity System



Enhanced Sector Digitalisation and Data Sharing

Separated NESO Systems, Processes and Services

Each of our Performance Objectives is underpinned by a set specific deliverables, success measures and key performance indicators that will support the delivery of our Strategic Priorities between April 2025 and March 2026.

Where can I find out more?

Draft BP3 Consultation Webinar Series Launch

Monday 9 December 2024 - 14:30 – 15:30

Draft BP3 Webinar Series: Clean Power 30 & Whole Strategic Energy Plans

Tuesday 10 December – 11:00 – 12:00

Draft BP3 Webinar Series: Operating the Electricity System & Secure and Resilient Energy

Thursday 12 December – 11:00 – 12:00

Draft BP3 Webinar Series: Connections Reform & Fit-for-Purpose Markets

Friday 13 December 09:00 – 10:00

Draft BP3 Webinar Series: Enhanced Sector Digitalisation and Data Sharing & Separated NESO Systems, Processes and Services

Friday 13 December 14:30 – 15:30

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Have your say on our draft plan

Consultation now open until **10 January 2025.**
Responses via the form on the NESO website or can be emailed to box.neso.riio2@nationalenergyso.com

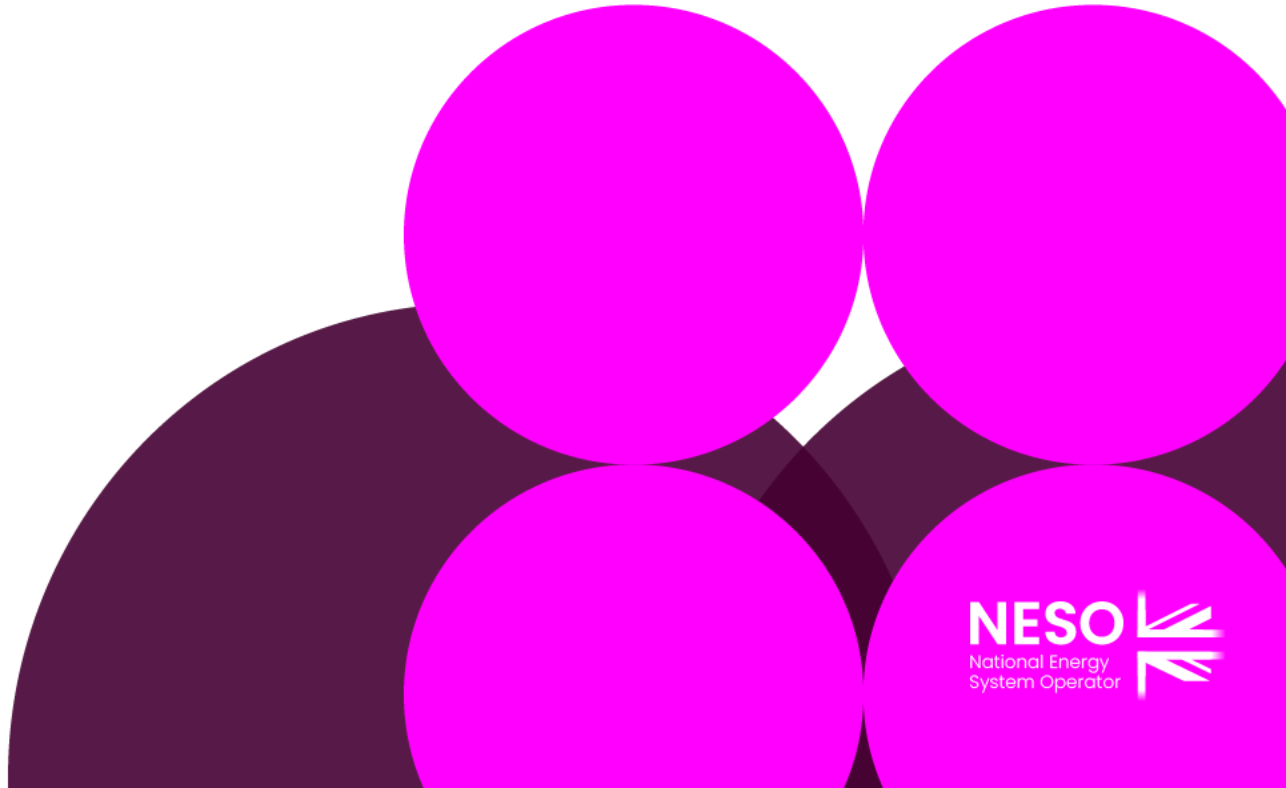
Open Balancing Platform Update

Item 6

Bernie Dolan

Topics to discuss…

- Standardising Interfaces - Has the TAC experience of the following:
  - How to agree common standards for interfaces?
  - Are common standards even possible?
  - How to align with future technology trends



A Year of the Open Balancing Platform (OBP)

12 Dec 2023
Business Go-Live
Control Room use OBP to issue first instructions

Disappointingly some high price issues

OBP used to issue 920 offers & 170 bids on first day

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

First "hands on" release

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 Instructions
Number of voided drops < 3% in Smalls <1% in battery

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

Battery by count utilisation reaches 95%

Sep 2024
SMP Interface
OBP receiving data from auction platform

Sep 2024
IEMS Interface
OBP receiving live metering data Monitoring unit behaviour

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

SMP: *Single Markets Platform*

IEMS: *Integrated Energy Management System*

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Value Delivered by the Programme

Manage an Increase in Market Participation and Use of Flexible Technology

55% increase in the number of assets receiving BM instructions since the programme was established.

286% increase in battery dispatch volume since OBP R1

89% increase in small BMU dispatch volume since OBP R1

941% increase in number of dispatch instructions to batteries

75% increase in number of dispatch instructions to small BMUs

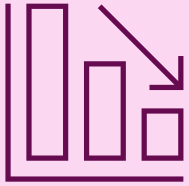
Quickly Adapt to New Requirements, Innovation & Services

Delivered over 1700 changes, improvement, and fixes in OBP with minimal outage time

Enabled bulk dispatch in the battery zone in R1 of OBP

Implementation of:
- Balancing Reserve
- BM Quick Reserve
- MW Dispatch

Delivery of a Dispatch Efficiency Monitor



Support a Reduction in CO2 Emissions

The Carbon Intensity Produced per kWh of Energy has decreased from 172 gCO2/kWh in FY21 to 146 gCO2/kWh in FY24, a saving a 26 gCO2/kWh.

2.5% can be attributed to the Balancing Programme providing an estimated carbon saving of £46 million in FY24

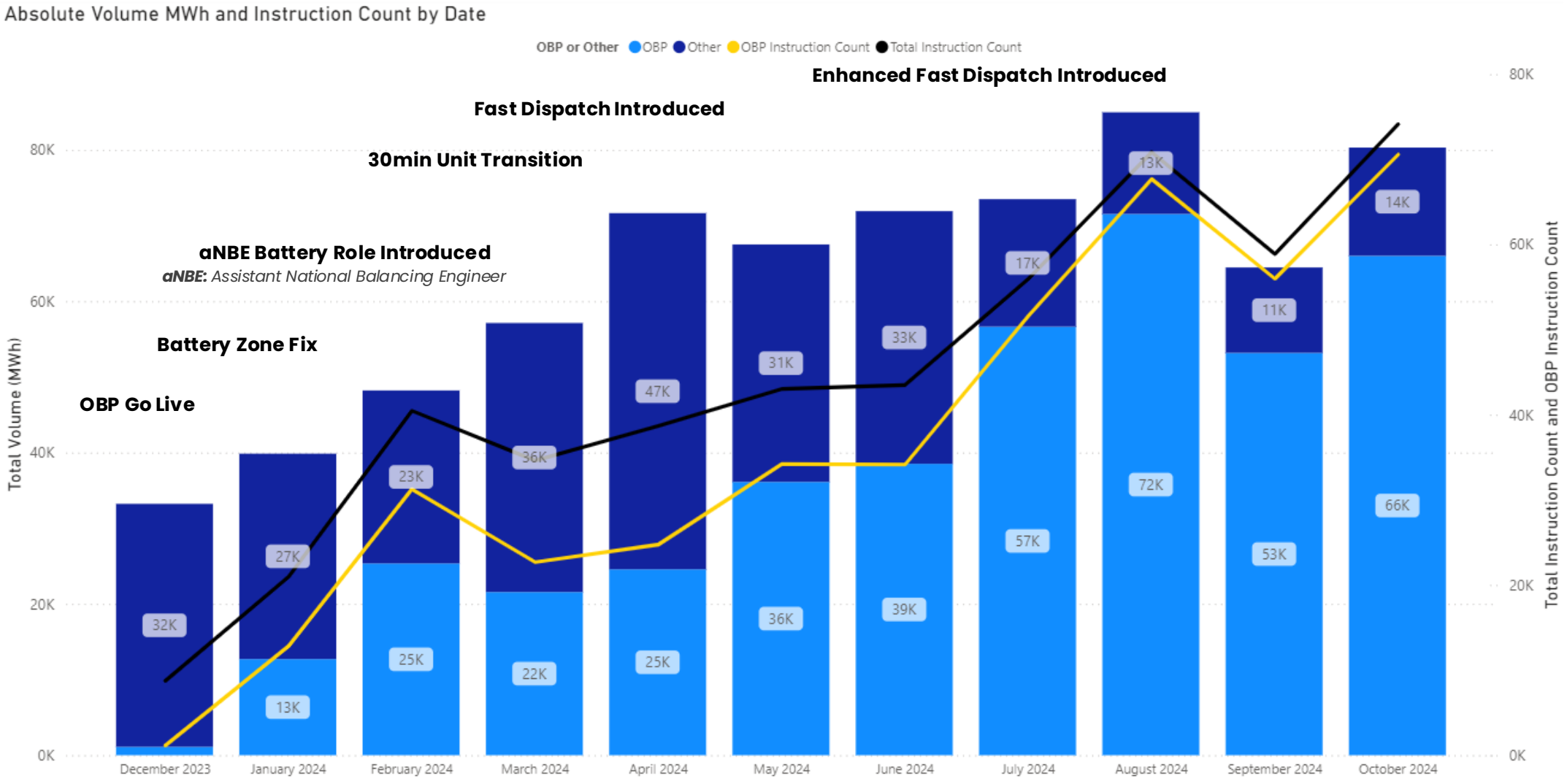
49 GWh increase in battery dispatch since OBP release 1 offsetting approx. 50 metric tonnes of CO2 providing a carbon saving of approx. £13m

External Recognition

Energy Storage Awards

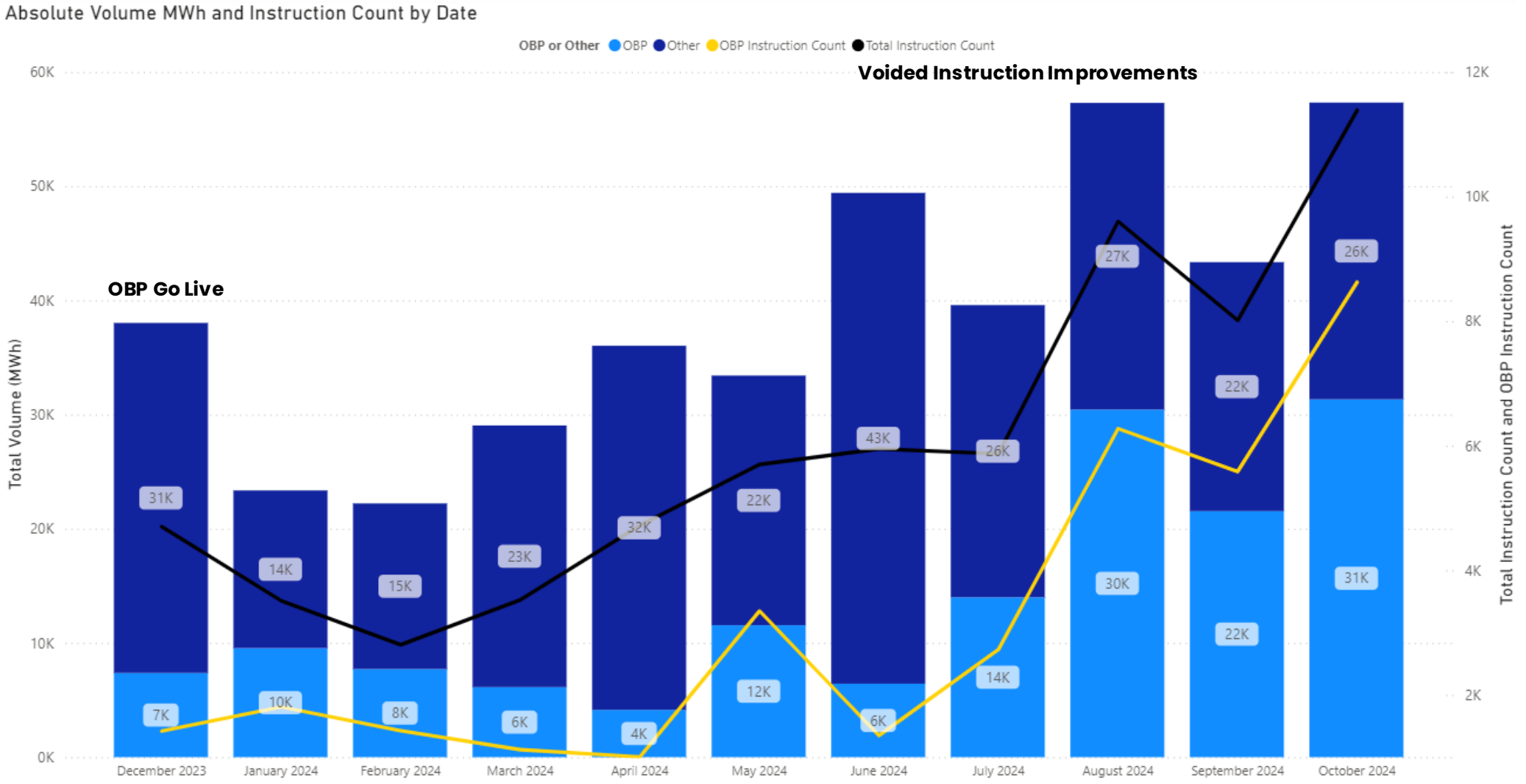
Product of the Year

OBP Utilisation – Batteries



Comparing the 3 months before OBP went live to the latest period – 01 August to 01 November 2024 - we observe that the average dispatch volume (MWh per day) of Batteries in the BM has increased from **657 to 2,537 (286% increase)**. The number of daily instructions has increased from **213 to 2,241 (941% increase).**

OBP Utilisation – Small BMUs



Comparing the 3 months before OBP went live to the latest period – 01 August to 01 November 2024 - we observe that the average dispatch volume (MWh per day) of small BMUs in the BM has increased from **914 to 1,727 (89% increase).** The number of daily instructions has increased from **183 to 320 (75% increase).**

Balancing Systems Release Plan

Legend

- Complete
- Moved to a later date (no. of quarters moved)
- Moved to an earlier date (no. of quarters moved) OR New
- No change

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

Q3 FY 24/25 (Oct 24-Dec 24)

OBP Capabilities:
1. Manual instructions

OBP Enablers:
1. Interface to Data Analytics Platform (DAP)

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

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

OBP Capabilities:
1. Bulk Dispatch Wind BMUs (rule based)
2. Constraint Management
3. Pumped Storage BOAs

OBP Enablers:
1. Interface to Ancillary Settlement for NBM

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

OBP Capabilities:
1. Non-BM Instruction Types
2. Non-BM Quick Reserve
3. National Optimiser
4. Optimisation within a Constraint
5. New storage parameters

OBP Enablers:
1. Non-BM APIs
2. PEF Integration
3. OBP becomes Operationally Critical (+1)

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

OBP Capabilities:
1. BM & Non-BM Slow Reserve
2. Move MW Dispatch
3. Move Response (DC/DM/DR)

OBP Enablers:
1. Ready to decommission ASDP
2. EDT/EDL mastered from OBP

Q3 FY 25/26 (Oct 25-Dec25)

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

Q4 FY25/26 (Jan 26/Mar 26)

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

Retire ASDP, VERGIL & CLOGS

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Standard Interfaces

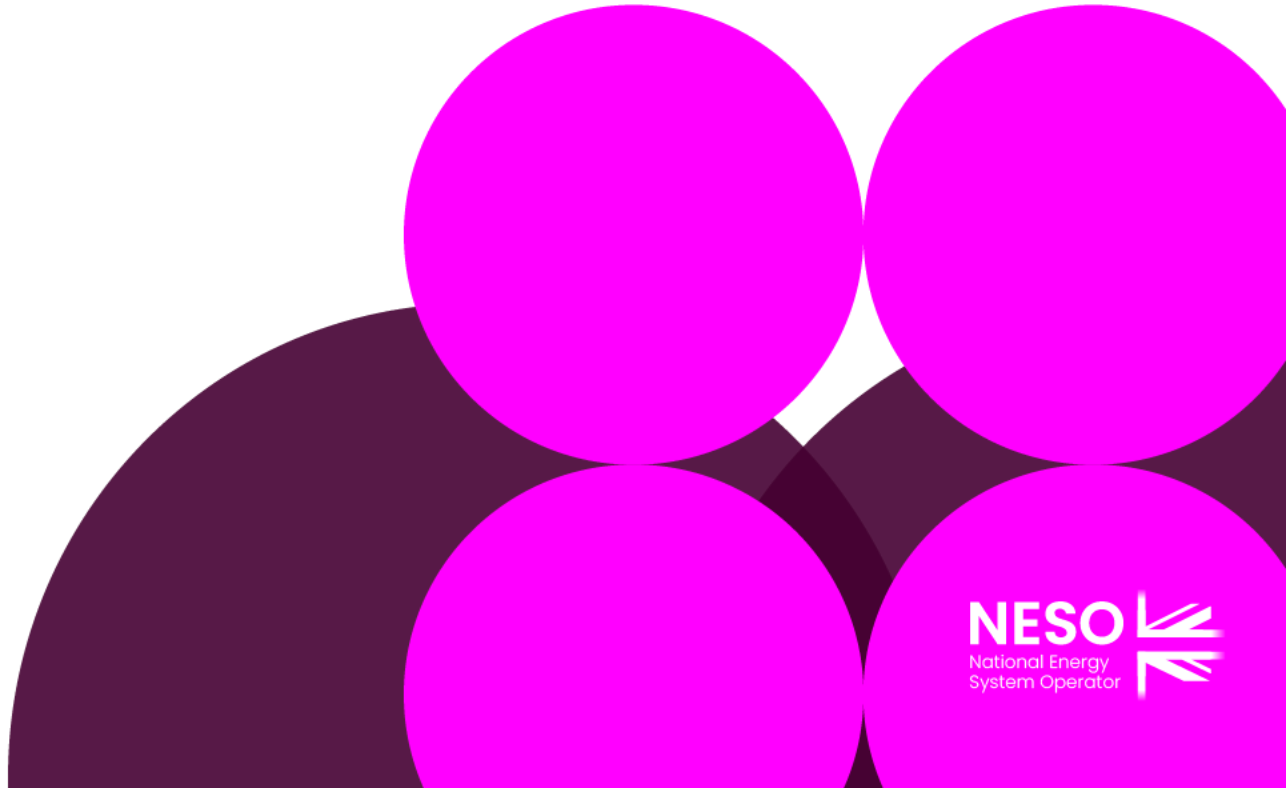
As we connect to more non-BMUs, at Transmission and Distribution level, we have a proliferation of different APIs

Has the TAC experience of the following:

- How to agree common standards for interfaces?
- Are common standards even possible?
- How to align with future technology trends

Break

10:35 – 10:50



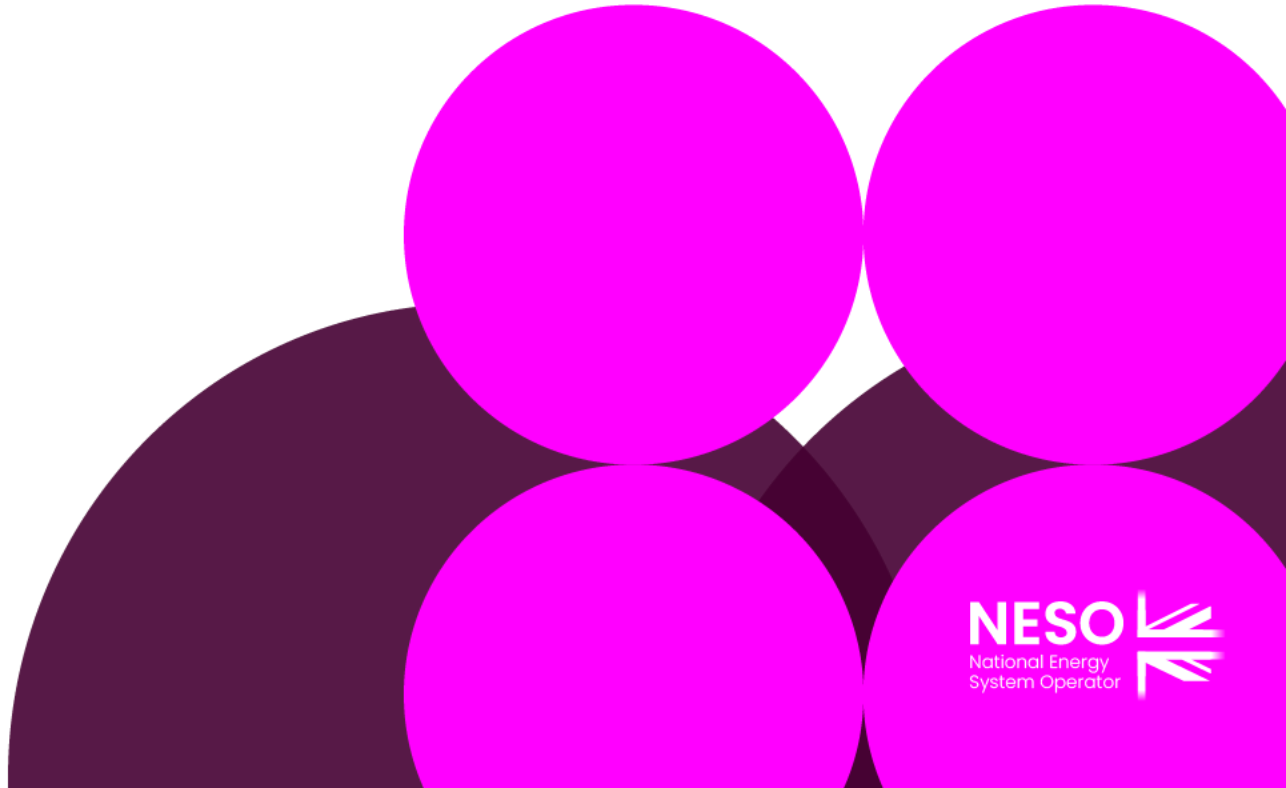
Clean Power 2030

Item 7

Jonathan Barcroft

Topics to discuss…

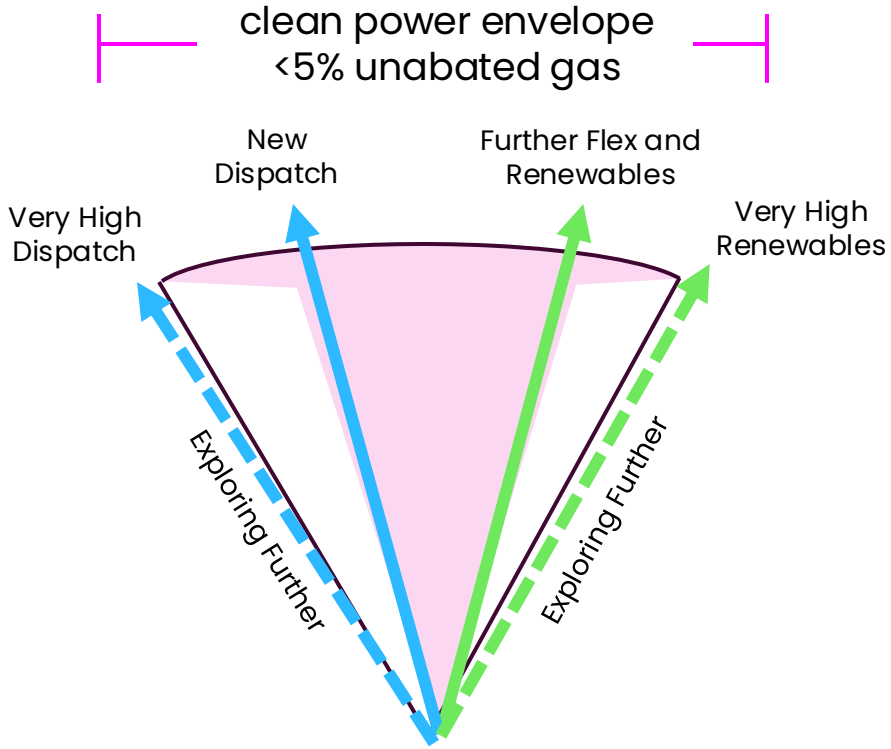
- Our approach to ensuring data is trusted and accessible
- Cross sector accelerators and enablers
- Maximising capabilities for future scenario modelling



Clean power pathways

New Dispatch	Further Flex and Renewables
• Growth in renewables but at a lower level compared to Further Flex and Renewables. • Deployment of new low carbon dispatchable power (CCS and hydrogen) alongside highest nuclear capacity	• Highest levels of societal engagement, with higher residential and industrial demand flexibility and more storage. • Fast deployment of renewables (50 GW offshore wind), but no new dispatchable power.

All pathways see increased electrification of transport, heat and industry by 2030 as needed to meet economy-wide carbon targets. Energy efficiency improvements continue across both pathways. **Clean power pathways will all require increased digitalisation, open data and Innovation.**



Further sensitivities: batteries, carbon price, nuclear, weather years and increased demand

Identified digitalisation enablers

Component	Description and context	Digitalisation enablers
Flexibility	Increasing consumer participation alongside adoption of smart home devices.	Data and digital infrastructure, automation and a consistent coordinated approach to support participation. Delivery of MHHS.
Connections	Requirement for connections reform & queue management	Collaboration, coordination and data sharing e.g. connections 360.
Networks	Acceleration and on time delivery of identified networks projects.	Monitoring of project planning & delivery through data sharing, increased DER and ANM visibility and probabilistic modelling.
Operability	Increasing needs for stability, voltage and frequency services to manage future system.	EMT and RMS model sharing, coordination with improved distribution networks asset modelling
System Operations	Forecasting, access planning and dispatch. Training support & operational coordination.	Integration of whole system data sources and enhanced forecasting and applications of AI. Supporting transparency through data sharing.
Supply chain & skills	Securing engineers, digital specialists is increasingly difficult due to demand for these skills domestically & globally.	Explore broad range of options to address specific skills gaps. A sector skills plan could help provide the trained workers the sector needs.

MHHS = Market-wide half-hourly settlement
DER = Distributed Energy Resources
ANM = Active Network Management

EMT = Electromagnetic Transient
RMS = Root Mean Squared

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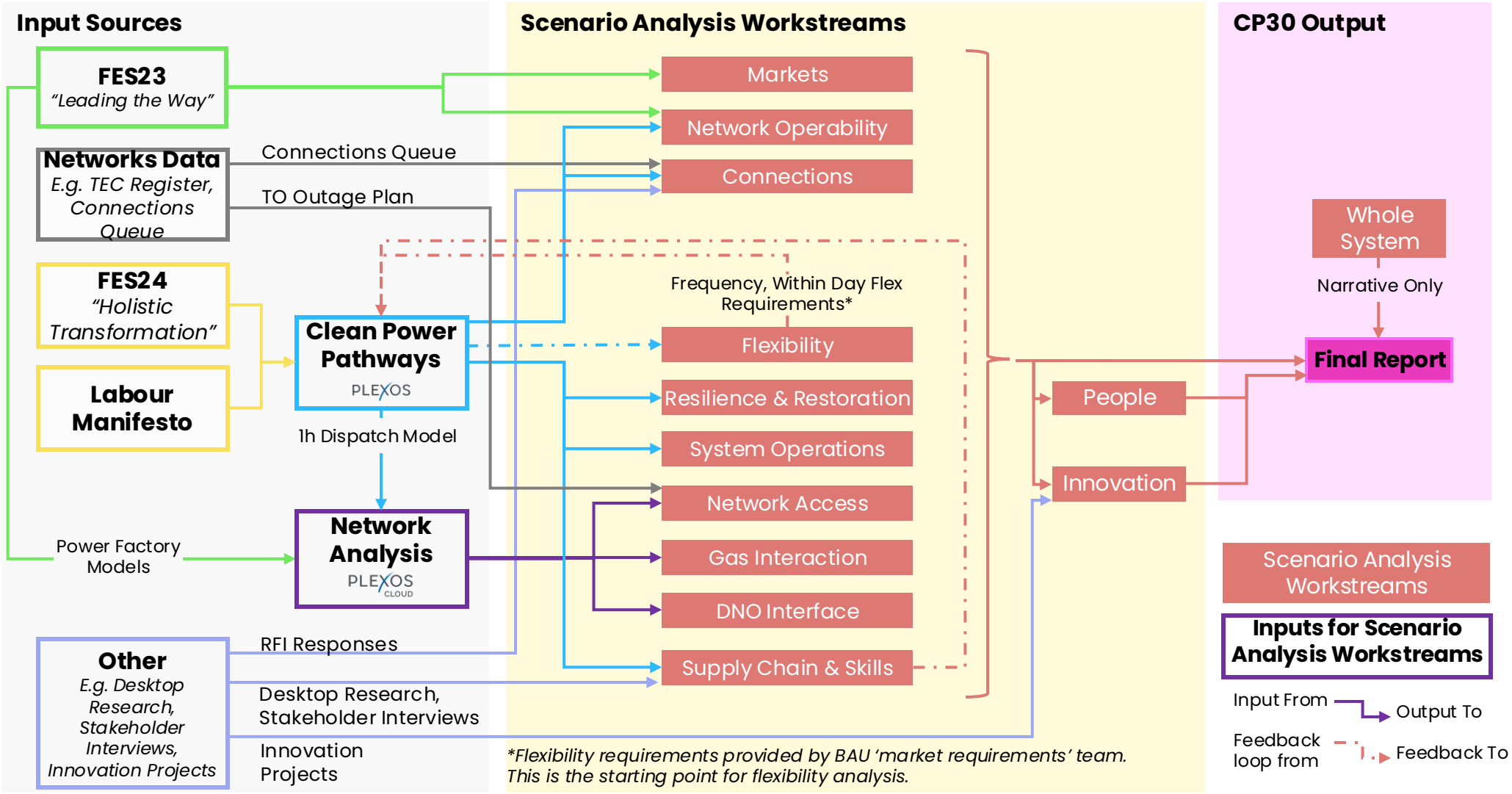
How analysis was developed



Digitalisation recommendations

Unified digitalisation plan

The sector develops and delivers on a system-wide digitalisation strategy aligned with government's plan for clean power by 2030, ensuring cohesive progress and prioritisation

Transformative innovation initiatives

Prioritise transformational and scalable innovation projects that can significantly accelerate progress.

Support these initiatives with heightened financial, policy, regulatory and industry backing to ensure broad adoption.

Enhanced data sharing

Focus on robust and scalable data-sharing infrastructure, supported by policies and investments that encourage widespread adoption across the sector.

Maximise commercial opportunities for digital products and innovation

Identify and remove barriers to create a dynamic marketplace for digital products and services, leveraging open data sharing and transparency to foster innovation from all.

Responsible AI integration

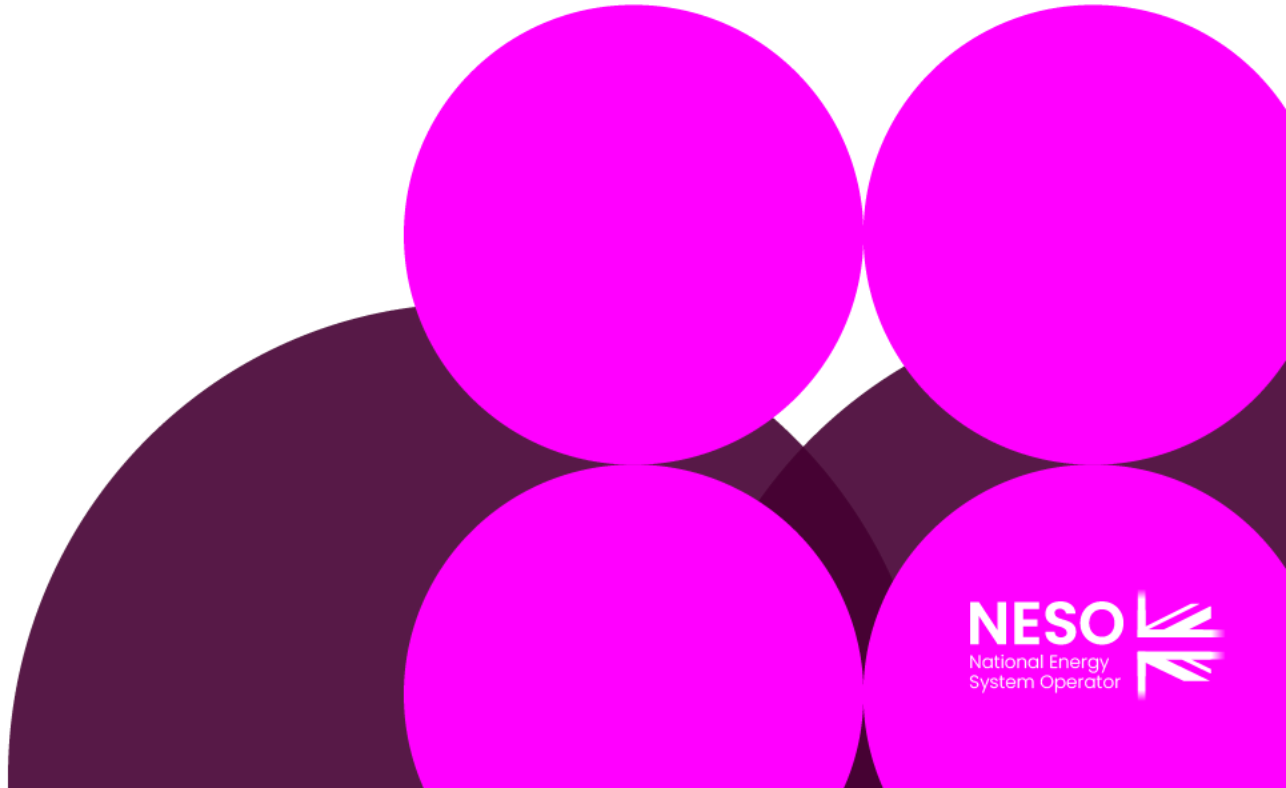
Develop and implement responsible AI to revolutionise decision making.

This requires the support of clear policies, technology partnerships and investments.

AI Journey

Item 8

Carolina Tortora



NESO AI Ambition

Our overall ambition will be achieved through **three key incremental pathway objectives** for NESO's AI strategy:

Ambition Pathway 1 **NESO Excellence**	→	Ambition Pathway 2 **GB Industry Champion**	→	Ambition Pathway 3 **Global Impact**
Becoming a leading adopter of AI solutions		**NESO acting as an accelerator of AI within the GB energy industry**		**Take our GB experience and share it worldwide as a blueprint of how to leverage AI in decarbonisation.**

Create AI technology that is deployed across GB, and world-wide, to drive the transition to net zero and unlock a blueprint of AI excellence in energy

Enabled through key workstreams

- **1. Policy and Governance**
- **2. Talent and Culture**
- **3. Technology & Data**

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NESO AI Product Suite & Platform

Across Neso AI, we have identified **our early product suite aligned to 3 Key Focus areas.**
All of these will be enabled by our NESO.AI Platform ecosystem.

Clean Power and Decarbonised Future
AI Models to impact Industry

AI Models and capabilities to help organisations with Forecasting, supply and demand response to consumer demand

e.g. forecasting

e.g. Scenario Planning

Consumer Value & Customer Centricity
AI Experiences

Personalised experiences, through AI, including NESO.GPT for consumers and customers

e.g. Code management

e.g. GenAI interaction for all codes

Digital Mindset and People
AI for the people

Shifting the day to day working across the organisation with an open approach to sharing with the industry

e.g. NESO.GPT

Enabled Through our NESO.AI Platform Ecosystem

A platform orchestrated by NESO that enables others to connect their models and technology to be used by end-users, creating a connected ecosystem for Energy AI models

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Technology & Data

Foundational Work

DD&T have introduced AI capabilities enterprise wide.

These include:

- an OpenAI service on our AI platform for building genAI solutions
- a demand forecasting tool using our time-series AI forecasting capabilities
- enhanced information retrieval to improve AI model accuracy and relevance

Strategic AI Powered Programs Launched

Volta

Volta is a first of its kind product, where AI will be brought into the Control Room to aid real time decision making and increase transparency.

High-level design is complete, and we are now moving to build phase with selected ecosystem partners.

By October 2025, we aim to have introduced an MVP for improved scheduling strategies and introduce an AI-based decision awareness tool, with proof of concept for additional features.

Vanguard

Vanguard will bring AI tools to the Energy System Planners, increasing their ability to model complex scenarios at pace.

We have kicked off work to address the requirements and outputs the tool will need to deliver.

A clickable prototype has been created and enabling data foundations are being developed through the DAP (Data & Analytics Platform) Enhancement Programme.

Other AI Big Bets

Network Modelling for Outage Planning

Objective: Use AI/ML to simulate multiple outage scenarios rapidly.

Outcome: Greater confidence in outage planning with proactive disruption management.

Business Value: Reduces operational risks, enhances customer satisfaction, and lowers planning costs.

Monitoring for early detection of Market Abuse

Objective: Implement AI/ML tools to identify market abuse trends and anomalies.

Outcome: Faster, accurate detection of irregularities, ensuring regulatory compliance.

Business Value: Safeguards market integrity, reduces financial risk, and strengthens stakeholder trust.

Expedited Strategic Energy Planning

Objective: Enable rapid modelling of integrated energy scenarios for clean power.

Outcome: Faster, more flexible clean power pathway modelling with wider scenario exploration.

Business Value: Enhances agility, optimizes resource allocation, and reduces planning cycles.

Other AI Big Bets

Regional Energy Scenario Planning

Objective: Build AI capabilities for regional energy forecasting and investment analysis.

Outcome: Analyse regional scenarios & provide the forecasting & investment analysis needed to inform Local Authority planning

Business Value: Drives efficient, localized planning, supports decarbonization, and strengthens partnerships.

AI Transformation of Contracting Processes

Objective: Automate customer applications and contracting processes (e.g. EMR, Connections)

Outcome: Scalable, efficient, and transparent customer interactions.

Business Value: Improves customer experience, lowers operational costs, and supports future growth.

Performance Monitoring for Stakeholder Compliance

Objective: Use AI/ML to monitor and cross-check stakeholder performance data against contractual obligations.

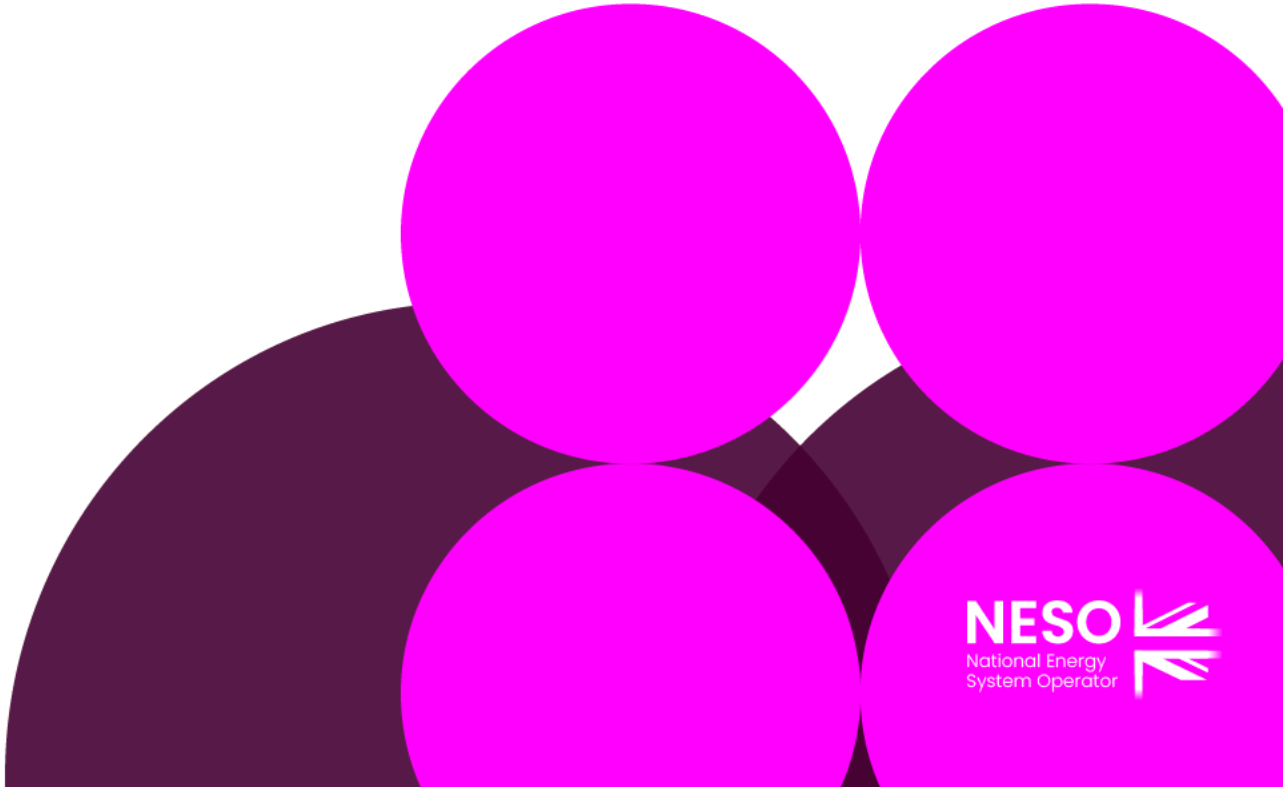
Outcome: Ensures providers meet contractual commitments with accurate performance tracking and penalty determination.

Business Value: Enhances compliance, reduces financial risks, and ensures accountability for stakeholders at scale and lowering operational costs.

Subgroups update

Item 9

Cameron Shade



Subgroups update

Digital and Data Strategy held 11th October

- Digitalisation Strategy and Action Plan
- Data Strategy

- Next meeting 10th Jan 2025.

Control Room of the Future held 2nd September

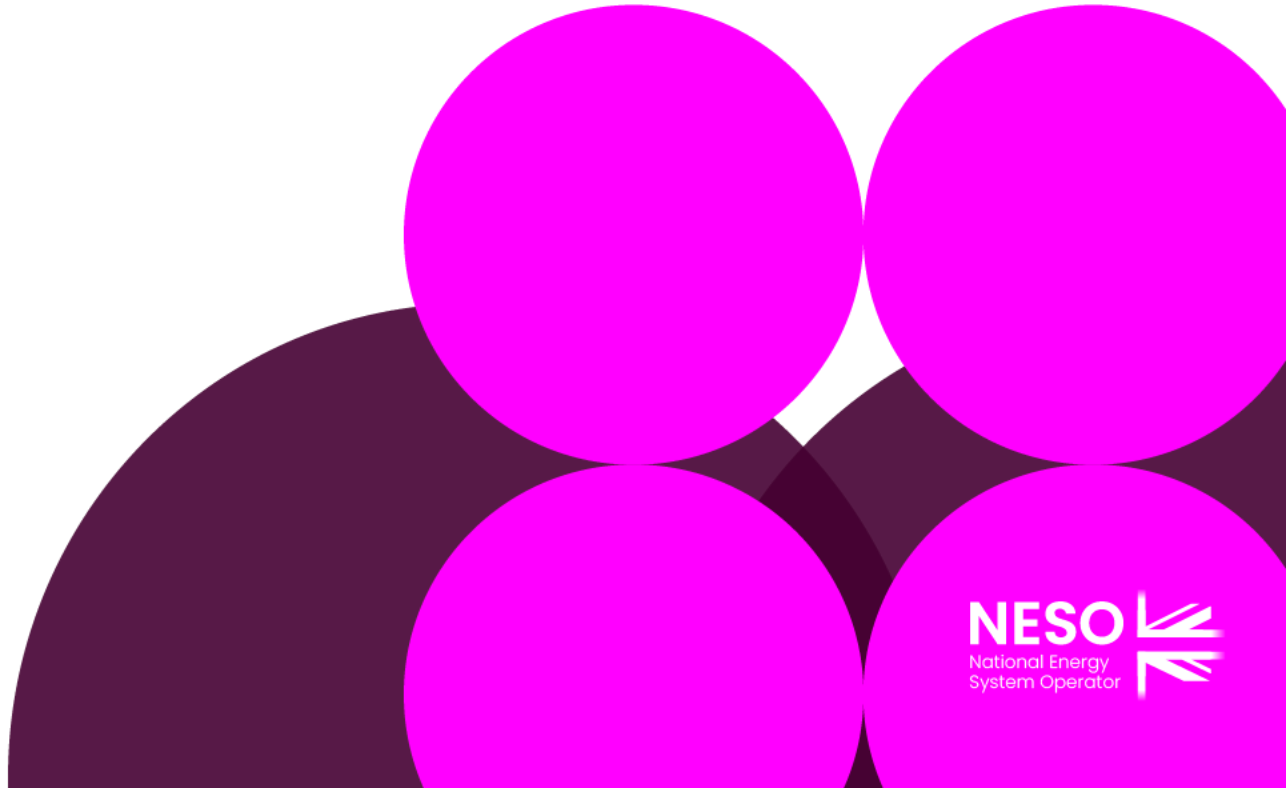
- ESO Future Control Strategy update
- DSO interaction

- Next meeting date TBC but will be W/C 20th January.

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.

7th Mar 2025

AOB

Item 11

Eric Brown