



ESO Technology Advisory Council

TAC-15

7th June 2024

Meeting pack

TAC-15 agenda – 7th June 2024

Item	Start	Finish	Time	Item	Presenter	Notes
1	09:00	09:20	10	Welcome & Apologies	Eric Brown	
2	09:20	09:25	10	Minutes of last meeting and matters arising	Eric Brown	
3	09:25	09:35	15	Feedback from the last meeting	Cameron Shade	
4	09:35	10:10	35	Connections	Darren Holyoake / Robyn Jenkins	
5	10:10	10:40	35	Energy Data Domains	Craig Pinhorne-Smy	
	10:45	11:05	20	BREAK		
6	11:05	11:35	30	Data sharing infrastructure – Pilot Phase	Simon Evans	
7	11:35	11:50	15	Open Balancing Platform update	Nisha Bhamidimarri / Mayank Jha	
8	11:50	11:55	5	Subgroups update	Cameron Shade	
9	11:55	12:15	20	Next meeting	Eric Brown	Next meeting: Friday 6th Sept 2024
10	12:15	12:30	15	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-14 have been published on the ESO website.
- The material from the meeting has also be published.
- This section will be used to discuss any matters arising.

Actions

ID	Action Description	Owner
A01	Discuss with MAC chair possible joint discussions in the future	Eric Brown
A02	Investigate whether teams can be used as an offline communication method with TAC members.	Joseph Stepney
A03	Organise September meeting in person	Cameron Shade
A04	Share purpose of subgroups with Alex Waslin	Cameron Shade
A05	Include Chair in subgroup meetings	Cameron Shade
A06	Work with Simon Pearson and Fred Drewitt to organise a session with another sector	Eric Brown



Feedback from the last meeting

Item 3

Cameron Shade

Feedback from the last meeting

The topics discussed at the last meeting were:

- Digitalisation Strategy
- DevSecOps transformation
- FSO
- Open Balancing Platform

Open Balancing Platform

- Offer to share experiences offline from other countries on instructions.
- Feedback that batteries are discussed frequently for good reason but the small zone should not be forgotten.

Digitalisation Strategy

- TAC highlighted when data and data engineering becomes more complex internal data divides appear based on who controls the data and who needs it.
- Discussed how Digital Planning Capability looks daunting but once Scalable Data platforms are tackled the other is less challenging.

Action Taken Since

- Defining data ownership top down with our data council. Recognising the complexity we are providing tooling and information regarding how data is derived.
- Developing models under the data sharing initiative to help define ownership. DAP will act as an intermediary for Geospatial layers ensuring documentation & continuing to focus on how our data platform scales in recognition of the highlighted challenge.

DevSecOps transformation

- TAC asked for clarification on ESO definitions of cross functional and where the accountability lies within teams.
- A risk on scaling automation is losing sight on what you're trying to achieve by focusing on targets.
- Query on whether Gen AI and automated coding is part of this.

Action Taken Since

- Teams organised for fast flow by team topologies and lean principles.
- Continuous evaluation of automation goals in alignment with key outcomes.
- Reviewing feasibility of Gen AI for code generation ensuring it is secure by design, test script automation, pipelines and AIOps

FSO

- Questions on how the team is being constructed, focus on new roles verse separating from NG.
- Further questions on how NESO will cope potentially losing things after separation.
- Ask for FSO to come back later in the year post separation.

Action Taken Since

- The new organisation design has been developed incorporating the new NESO roles into a new directorate structure.



Connections

Item 4

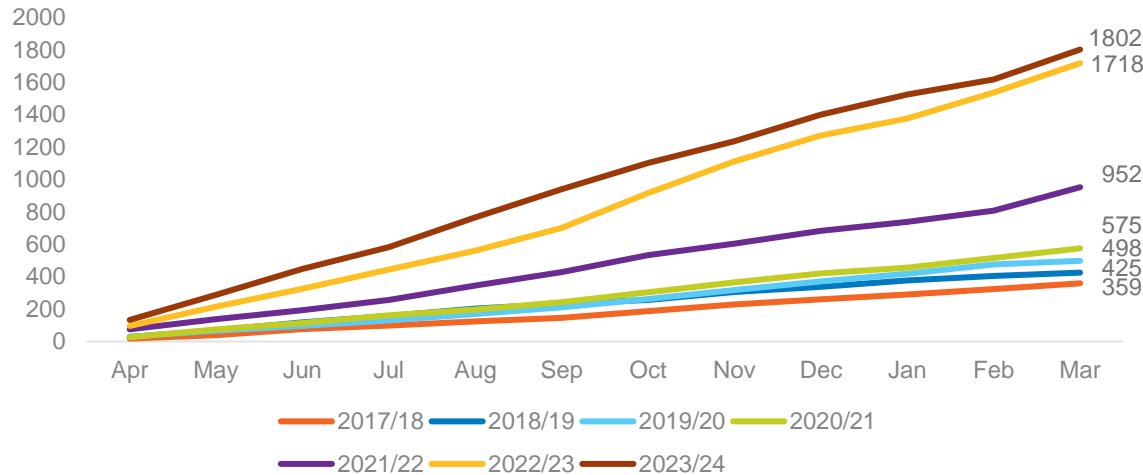
Darren Holyoake / Robyn Jenkins

Connections Overview

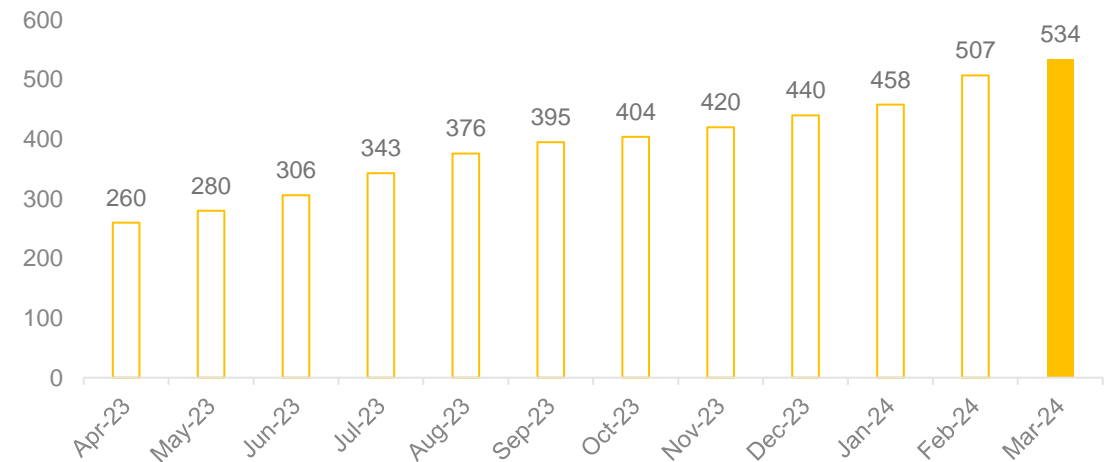
What is Connections

As the Electricity System Operator for Great Britain, we manage the connection and generation contracts that impact on the transmission system. We work closely with Transmission Owners (TOs) to support customer connections. Over recent years there has been an unprecedented growth in applications to connect to the transmission system. The process for connecting was written nearly 20 years ago and designed for fewer, larger generators than we are seeing today.

No. Licensed Applications



Connection Queue (Contracted Background)



Record Type	Licensed Applications Received - March24
ESO Modification Application	53
ESO New Connection Application	101
ESO Project Progression Application	31
ESO Statement of Work (SOW)	1
Grand Total	186

Queue Growth

- 534GW in transmission queue
- 274GW increase in 12 months
- 105% size increase in 12 months



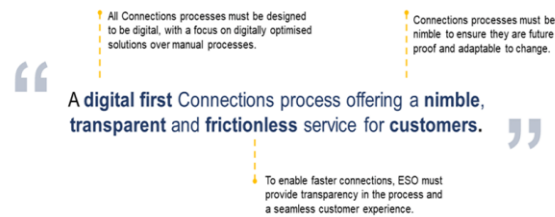
Connections Digital Charter Overview

Why do we need a charter

In our 2023 Digitalisation Strategy and Action Plan (DSAP) we announced the introduction of Digital Charters to provide a vision for each key business area, embracing the 'art of the possible'. This charter will specify ESO's plans for integrating Digital into Connections, addressing both immediate industry challenges and long-term digital ambitions. The charter goes above and beyond the published commitments in Business Plan 2 (BP2) and has been aligned to the in-flight BP2 Connections Portal programme. It sets out ESO's vision for enhancing and accelerating digitalisation of Connections. The Connection Portal programme will continue to run in parallel to the charter.

ESO's Digital Mission for Connections

Our Digital Mission for Connections is focused not only on how we can address the industry challenges of today, but how we can adopt a Digital approach to anticipate and adapt to future challenges.



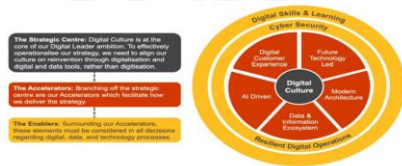
Connections Digitalisation Principles

Our digitalisation principles for Connections will underpin the digital journey we are undertaking



Digitalisation Strategy and Action Plan

In our 2023 Digitalisation Strategy and Action Plan, ESO set a new Digitalisation Strategy Vision: "Utilising the power of data and innovation, we will become a Digital Leader and drive collaborative digitalisation of the whole energy system. We are on a Digital Leader Journey, transforming our people, processes, data, and technology as 'Digital First'." Currently, ESO is in the Digital First phase of the Digital Leader Journey, striving for consistency in implementing a Digital First Culture. This charter is the Vision for enabling a consistent Digital First Culture in Connections, setting the intent for thinking about digital for the industry to solve current challenges, and beyond existing technology to plan for future challenges. The Digital Mission and Principles for Connections in this charter have been set to help foster a Digital Culture. We will be adopting principles and accelerators in line with the Digitalisation Strategy and Action Plan in order to create a consistent Digital Leader journey across our organisation. More detailed information on our overall Digital Strategy can be found here: <https://www.esoenergy.com/documents/2511/61666666>



Digitalisation Strategy Principles (above)

The following six key themes were identified within the charter.

Digitalisation Solutions	Connections Process				
	Pre-Application	Application Submission	Offer Period	Offer Review Period	Continuous Engagement
Geospatial Information Services	Customers can visualise the queue for their location		ESO and TOs can assess the application against the location queue		Ongoing geospatial data related to the queue informs current position
Combined TEC and DIS Register	The combined register will inform the visual queue				Continuous input into new Geospatial Information Services
Securities Process Optimisation			Automated processing of data from Customer Application to Offer	Automated notification of Securities receipt and system update	Automated processing of data for re-calculation every 6 months
Letters of Authority (LoA) Software	Automated check of Land Registry for LoA pre-application		Automatic processing of Letter of Authority information		
Optimised Criteria Modelling	'Soft-check' capability for customers pre-application	Modelling to support application submission			
Data Quality Improvement	Iterative and continuous improvements to data processing, standardisation and quality delivered through the above solutions				

Prioritised workstreams

1. Connections Portal - The Connections portal has been designed to digitalise the connections journey and account management for all customers.
2. Securities Process Optimisation (Security Statements) The existing process is manual and hosted on a .Net application and is used to generate the security statements. Due to the manual processes this can be time consuming hence the need to digitalise, migrate to Salesforce and automate this process. There is a requirement to have this automated process available for the June validation process.
3. Letters of Authority Software – Interim Solution – Phase 1 - To utilise software that allows us to check customers have letters of authority (LOA) covering Great Britain that will enable quick checks that customers have authority from the landowner before a connections project application is progressed. The submission of this document was optional until the end of March 2024 when this became mandatory.
4. Connections 360 -The outcome of the Connections 360 solution is to provide public access to data while maintaining strict access control on all sensitive data. We are currently launching a demo version for the developers and obtaining feedback from the public before the solution is deployed.
5. Connections Reform - We recognise the challenges currently facing our connections customers and are in the process of updating the connections application process. The Connections reform project will also capture other key initiatives such as LOA Strategic, E- Signing etc

Digitising any manual processes

Simplifying the Connections Team workflow

Improving overall user experience

Connections Portal

Why do we need the Connections Portal

The portal has digitised the application process and includes the following high-level functionality:

- Apply for connections and other agreements online.
- Monitor live applications and track progress.
- Access to signed contract documents.
- View of key milestones/milestone management.
- Communicate directly with your Connections Contract Manager.

What are the changes

Since the first release in FY23, digitising the application process. The portal has received monthly enhancements. The number of users has increased to over 1000 internal and external. Following approval by Ofgem of Queue Management last November, these changes were introduced into the portal in FY24 Q4 with further enhancements in FY25 Q1..

Queue Management

Milestone Number	Page	Milestone Name	Milestone Date	Milestone Status
1	1	E1-01 Create Substation	05/05/2024	Open
2	1	E1-02 Create Address	05/05/2024	Open
3	1	E1-03 Secure Land Rights	05/05/2024	Open
4	1	E1-04 Obtain Planning Approval	05/05/2024	Open
5	1	E1-05 Project Commence	05/05/2024	Open
6	1	E1-06 Construction Commence	05/05/2024	Open
7	1	E1-07 Create Address	05/05/2024	Open
8	1	E1-08 Secure Land Rights	05/05/2024	Open
9	1	E1-09 Obtain Planning Approval	05/05/2024	Open
10	1	E1-10 Project Commence	05/05/2024	Open
11	1	E1-11 Construction Commence	05/05/2024	Open

Queue Management

Update milestone

If you have an issue with this milestone you can apply for an exception.

E1-03 Secure Land Rights
1 May 2024

Submit one of the following: 1. Owner or tenant 2. Leasing agreement 3. Option to purchase 4. Exclusivity agreement 5. Signed agreement

Update milestone

If you have an issue with this milestone you can apply for an exception.

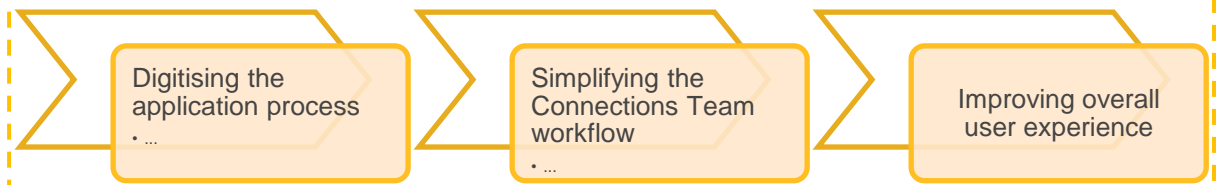
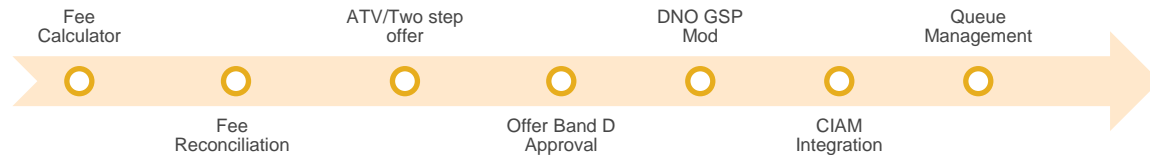
E1-04 Obtain Planning Approval
4 May 2024

The user's programme of works that demonstrates how the user will be ready for the Commissioning Programme and Commission Date. This must include a detailed programme for the user's works with a start and end date and agreed with the Network Transmission Licence and be a programme agreed with the Commission Date.

Update milestone

What are the benefits of the Connections Portal

1. Improving our internal processes
2. Improving systems and data
3. Reputational
4. Provide contractual expertise and management of connection contracts including provision of connection offers to customer
5. Management of the connection contracts programmes to secure delivery of connections to planned timescales and enforcing queue management milestones
6. Improved Customer Satisfaction



Connections Securities Statements

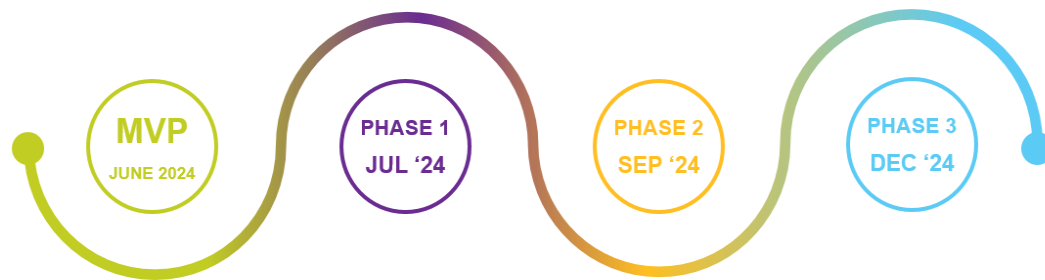
Who does this change impact?

Self-serve option via CPP Portal for Transmission Operator's to manage the bi-annual spend profile uploads. Automate uploaded spend profile data validation as per business rules & enable data quality checks, boosting CCMs efficiency & productivity

What are the changes

- Integrate Salesforce with SAP to track statements, payments and outstanding payments etc.
- Migrate Security Statements Generation and bi-annual statement reconciliations capabilities to Salesforce
- Automate the TOCO Upload, Security Statement Calculations & identifying data variations from previous statements features that removes the need for manual intervention, boosting CCM's productivity

Delivery Pipeline



What are the benefits?

1. Enhanced operational efficiency and streamlined workflows
2. Reduction in manual handling errors
3. Improvements on the security statement seeks to achieve an increase in accuracy in calculating the security statements
4. Standardisation
5. Automation

Boosts CCMs efficiency & productivity
Improved data quality

Automation

Holistic view of data in Salesforce and a streamlined collaboration with Finance team

Streamlines efficient process to gather Customer signatures digitally

Connections 360

Why do we need Connections 360

The outcome of the Connections 360 is to provide public access to data while maintaining strict access control on all sensitive data. We are currently launching a demo version for the developers and obtaining feedback from the public before the solution is deployed.

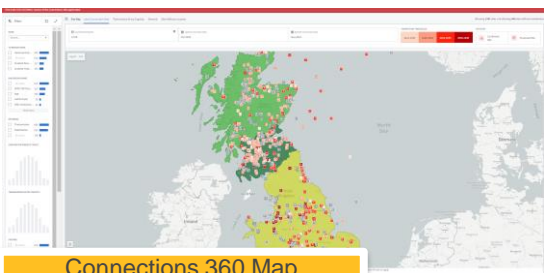
What is 360?

360 is an application which creates a web of interlinked data (known as an ontology).

Information can be pulled from this ontology in different formats e.g. maps, tables, charts, etc., to visualise connections information.

Live Connections Registers

Data Quality Alert Tracker



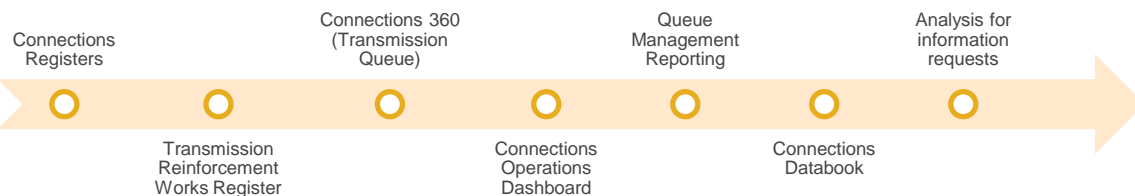
Connections 360 Map

Queue Management Reports

What are the benefits of 360 reporting?

1. **Real-time reporting** via direct Salesforce integration - no need to wait for daily refreshes
2. **Connections team self-service** easier access to info; reduced dependency on reporting team
3. **Richer data** by combining data sources internal and external to ESO
4. **Highly customisable user interface** offers tailored reports and dashboards
5. **Data quality tracking** to highlight issues and help improve the quality of information we share
6. **Salesforce continuity**; there is still the option to create and run ad-hoc reports in Salesforce

360 Reporting Pipeline [TBC]



The Connections BI team* will define a plan for moving from Power BI-led reporting to 360-led reporting

The Connections BI team* will plan and deliver training/ comms to ensure users are comfortable using 360 day-to-day

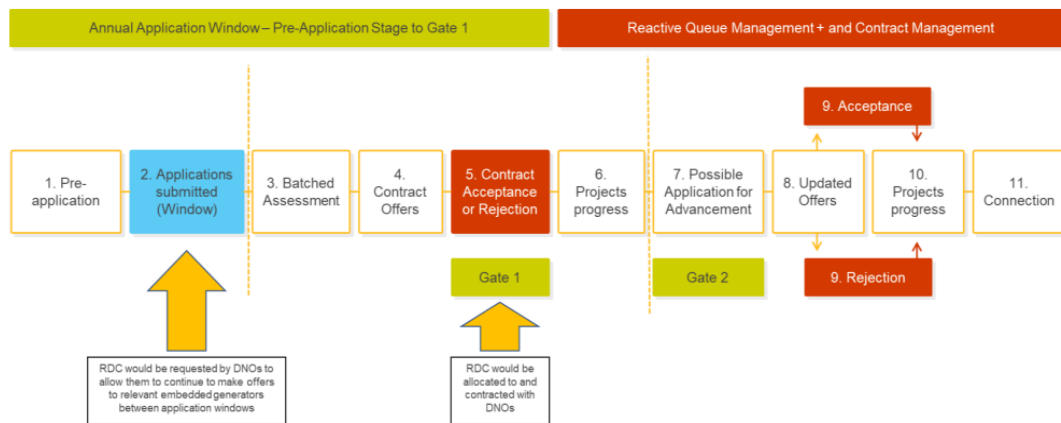
The Connections BI team* will encourage engagement and feedback from the wider Connections team to improve our reporting suite

Connections Reform

Why do we need Connections Reform

The Connections reform project is required to address the challenges faced in the existing Connections process. The connections process was designed almost 20 years ago. The drive to net zero has resulted in an unprecedented growth in the connections queue and we need to create processes and build systems that are fit for purpose now and into the future.

Figure 1 - High-level process flow showing the journey from the Pre-Application Stage through to Connection under the proposed reformed connections process (TMO4)



What is Connections Reform

This reform project forms part of our longer-term vision for change to the connections process. We also have a number of short-term initiatives to speed up connections to the grid, through our five-point plan.

1: TEC amnesty	2: Background modelling assumptions	3: Storage	4: Contract terms	5: Interim offer for BESS
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The short term initiatives have delivered significant improvements but we need more enduring, long-term strategic change. The current connections model is based on a first come, first served model. This means that some shovel ready projects can be at the back of a long queue. We are proposing a move to first ready, first connected – a model that prioritises projects that are progressing and ready to connect.

This proposal is currently progressing through industry code working groups and will be submitted to Ofgem later in the summer. We hope to have a decision by November and will implement the new model from January 2025.

The Connections reform project will also capture other key initiatives such as LOA Strategic, E-Signing etc

Energy Data Domains

Item 5

Craig Pinhorne-Smy

Topics to discuss

- Do you have feedback about the approach to data ownership and data domains that ESO plans to employ?
- Do you have feedback about the specific data domains that are being suggested to cover all ESO data?

Business Data Domain Taxonomy | Introduction

Context

- As part of the ESO commitment to implement Ofgem best practice in data management and to enable the energy industry to collectively strive towards decarbonisation, there is a need to define how the accountabilities and responsibilities for delivering on this commitment are structured in ESO, and also to establish a means by which data can be thought of and spoken about in the same way across all business and functional lines. The primary purposes of the Business Data Domain Taxonomy are to address both of these needs.

What is the Business Data Domain Taxonomy?

- The Business Data Domain Taxonomy is a **2-tier hierarchy of data categories or 'domains'** which is understood by and agreed throughout ESO.
- There are 7 domains and 78 sub-domains currently defined in version 7.0.
- The taxonomy is structured around data concepts familiar to the business and is **not necessarily aligned to the directorate** / organisational structure of ESO.

What is it used for?

- The taxonomy is essentially a model of the **domains of data ownership**, with each domain/sub-domain identifying a data owner that has key accountability for ensuring the data policy is adhered to for data within his/her ownership domain.
- The taxonomy also presents a 'model' for how data can be consistently talked about and **communicated** within the organisation. Note that it is not a logical data model for purposes of database design / data architecture, but is intended for use as a vehicle for establishing a common understanding of data between business lines and functions.

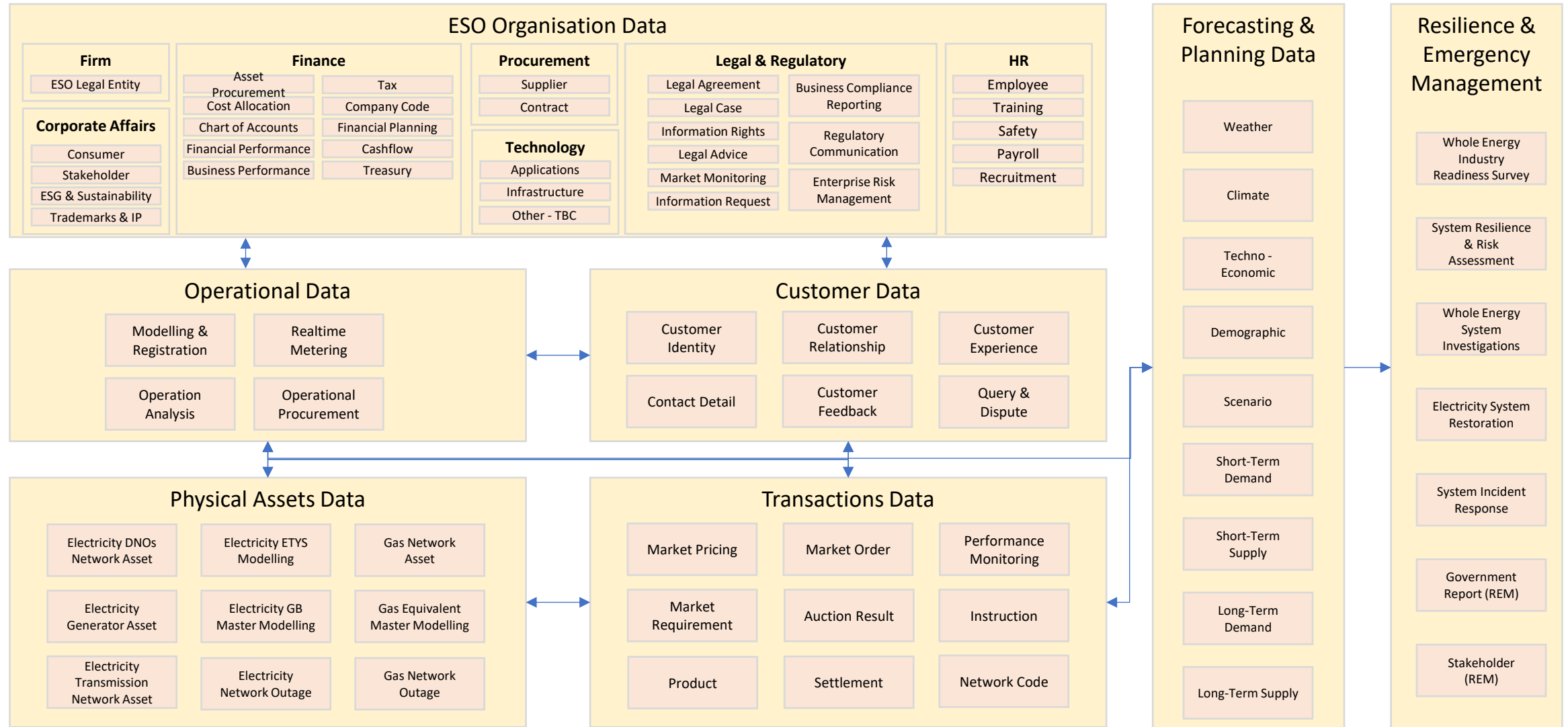
How will it benefit NESO?

- By structuring the taxonomy according to data concepts rather than the directorate, the Business Data Domain Taxonomy is foundational to becoming a **data-driven organisation**:
- It allows ESO and will allow NESO to **improve its ability to derive value from its data assets** (e.g. via AI and Analytics), by enabling a level of universal **trust** in data as it allows data concepts to be managed consistently regardless of where it is sourced, stored and used,
- It facilitates the **reduction of costs** associated with governing and managing the data lifecycle, by enhancing business-wide **shareability and re-use** of data assets from authoritative sources, and preventing the evolution of data silos along organisational lines.

What we need from you

- The Business Data Domain Taxonomy represents the business understanding of data and we'd like your feedback on the approach and structure / content of the hierarchy.

Business Data Domain Taxonomy v7.0





Break

10:40 – 11:00

Data sharing infrastructure – Pilot phase

Item 6

Simon Evans

Topics to discuss

- Gather input and feedback on the proposed pilot phase plan

**Virtual
Energy
System**

Powered by ESO

VIRTUAL ENERGY SYSTEM

CREATING THE DATA SHARING INFRASTRUCTURE



Simon Evans
Programme Director

ESO

Creating the common
data sharing infrastructure

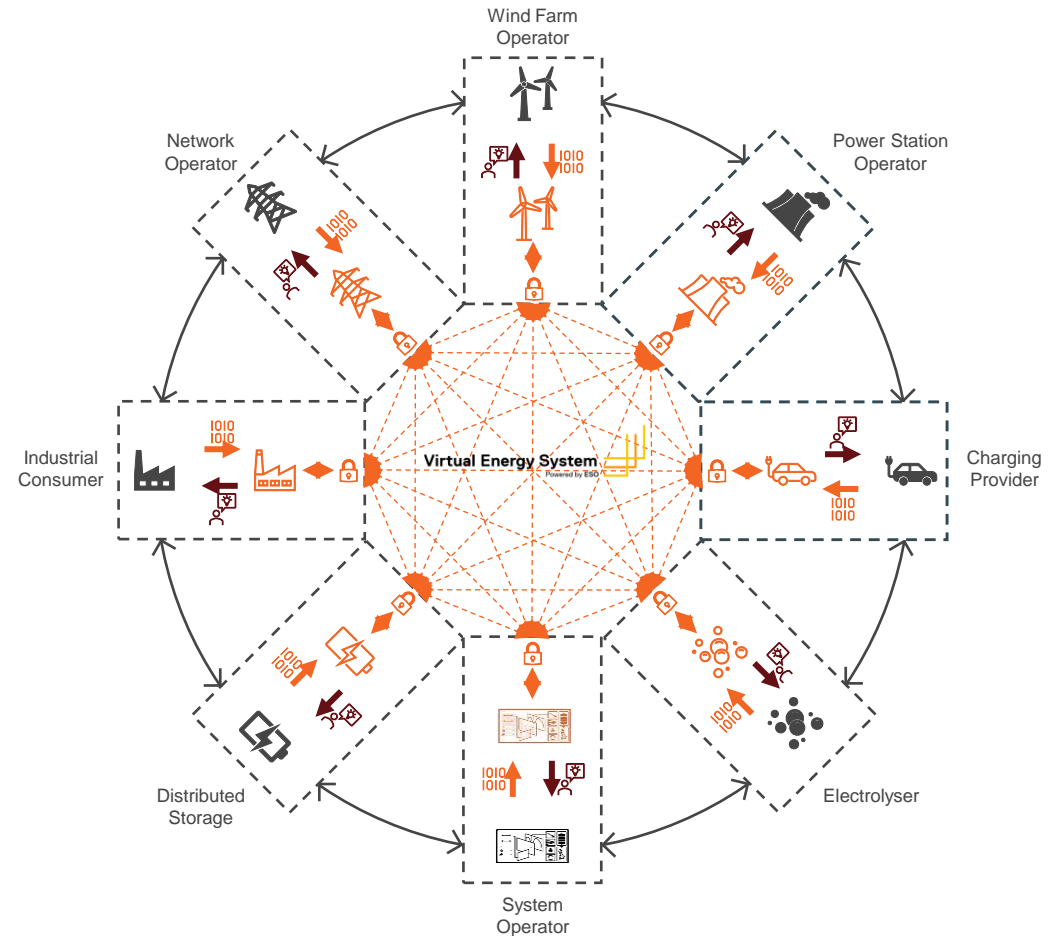
first
adjacent
step

To enable an ecosystem of
connected digital twins

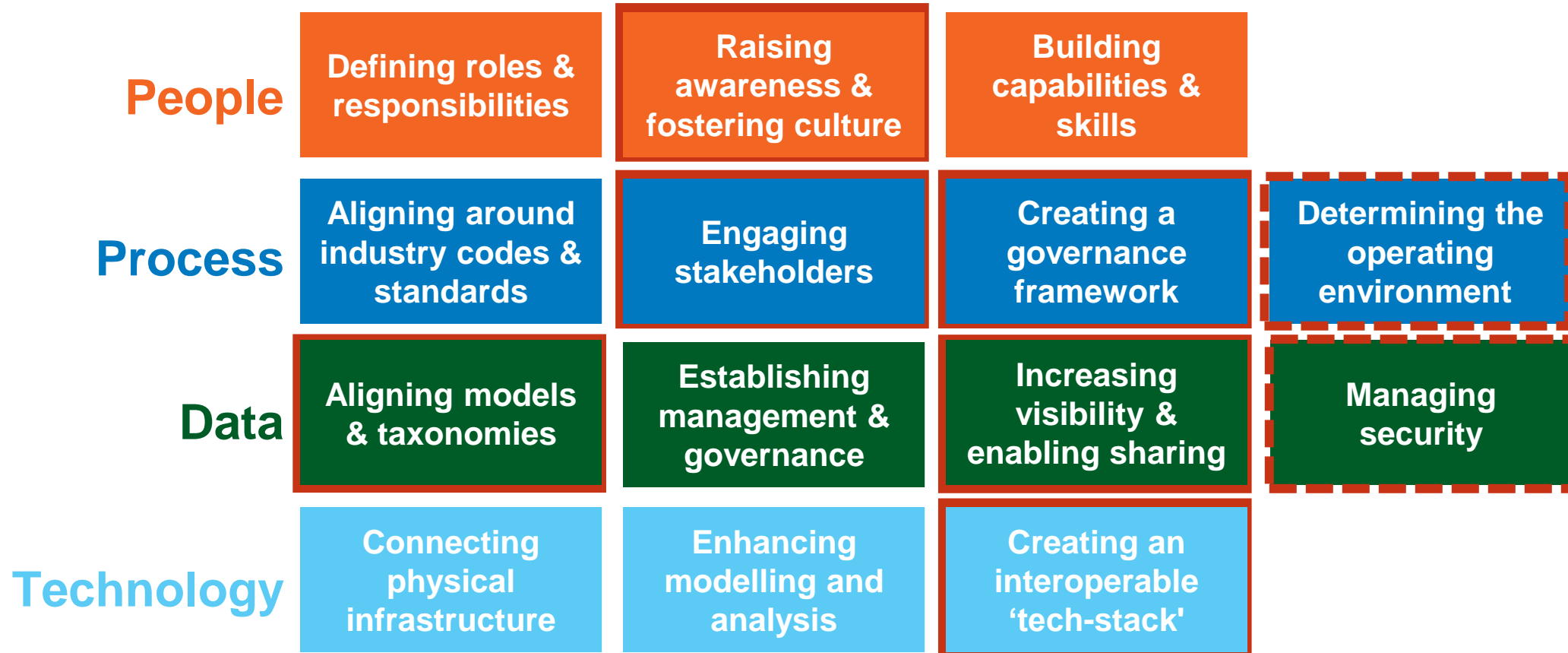
North
star

That will facilitate
the transition to net zero

(e.g. energy optimisation, carbon reporting, investment planning, ...net zero energy transition)



A socio-technical approach for connected digital twins



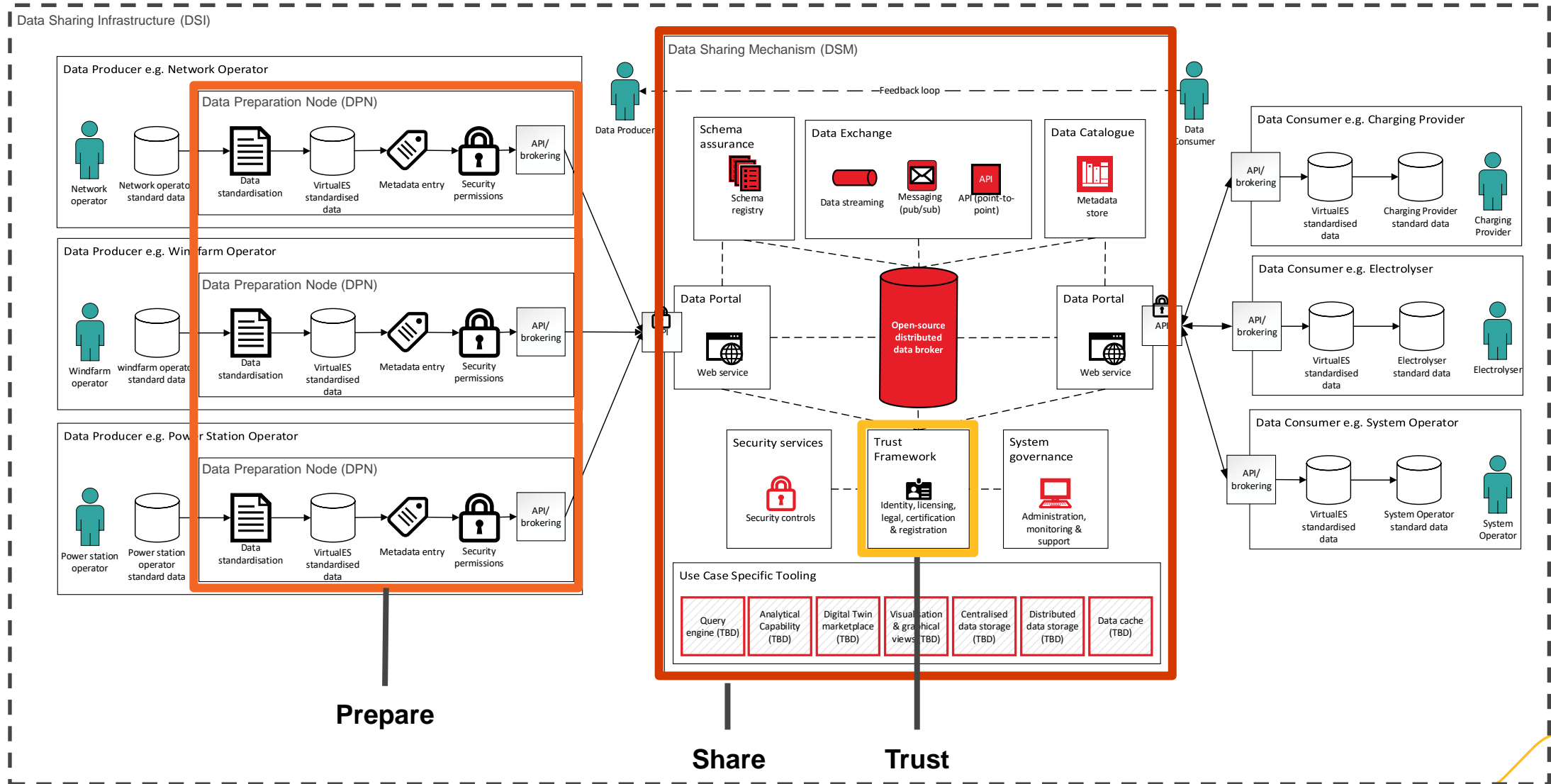
Technical alignment participants



Observers:



High-level design

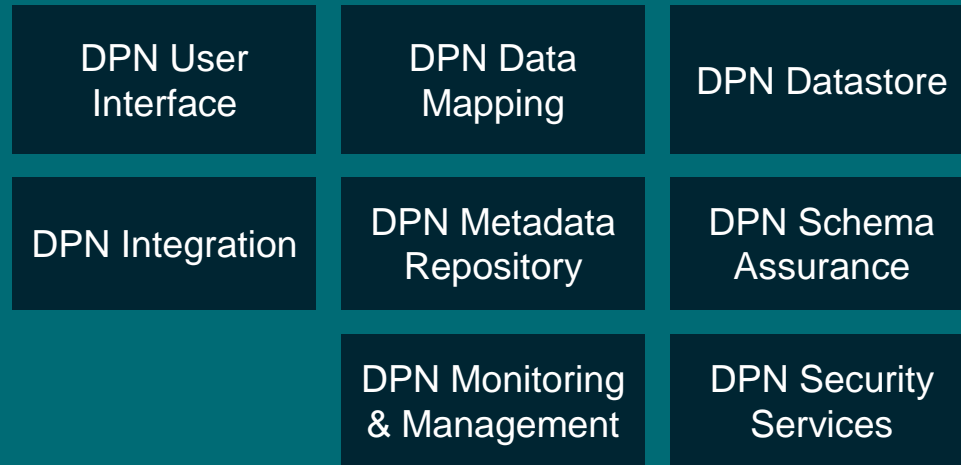


Level 1 application architecture

Data Sharing Infrastructure

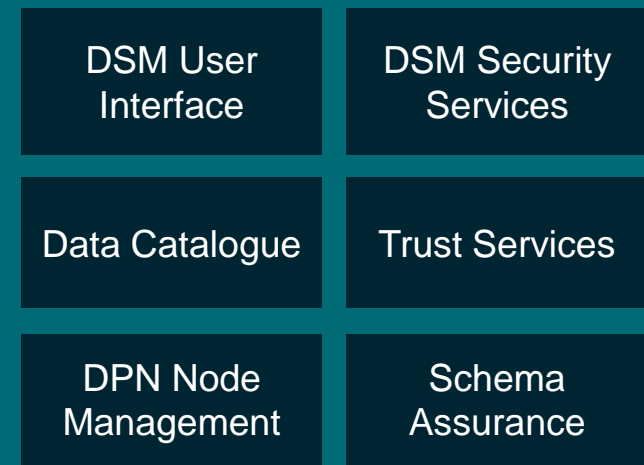
Data Preparation System

Data Preparation Node (DPN)

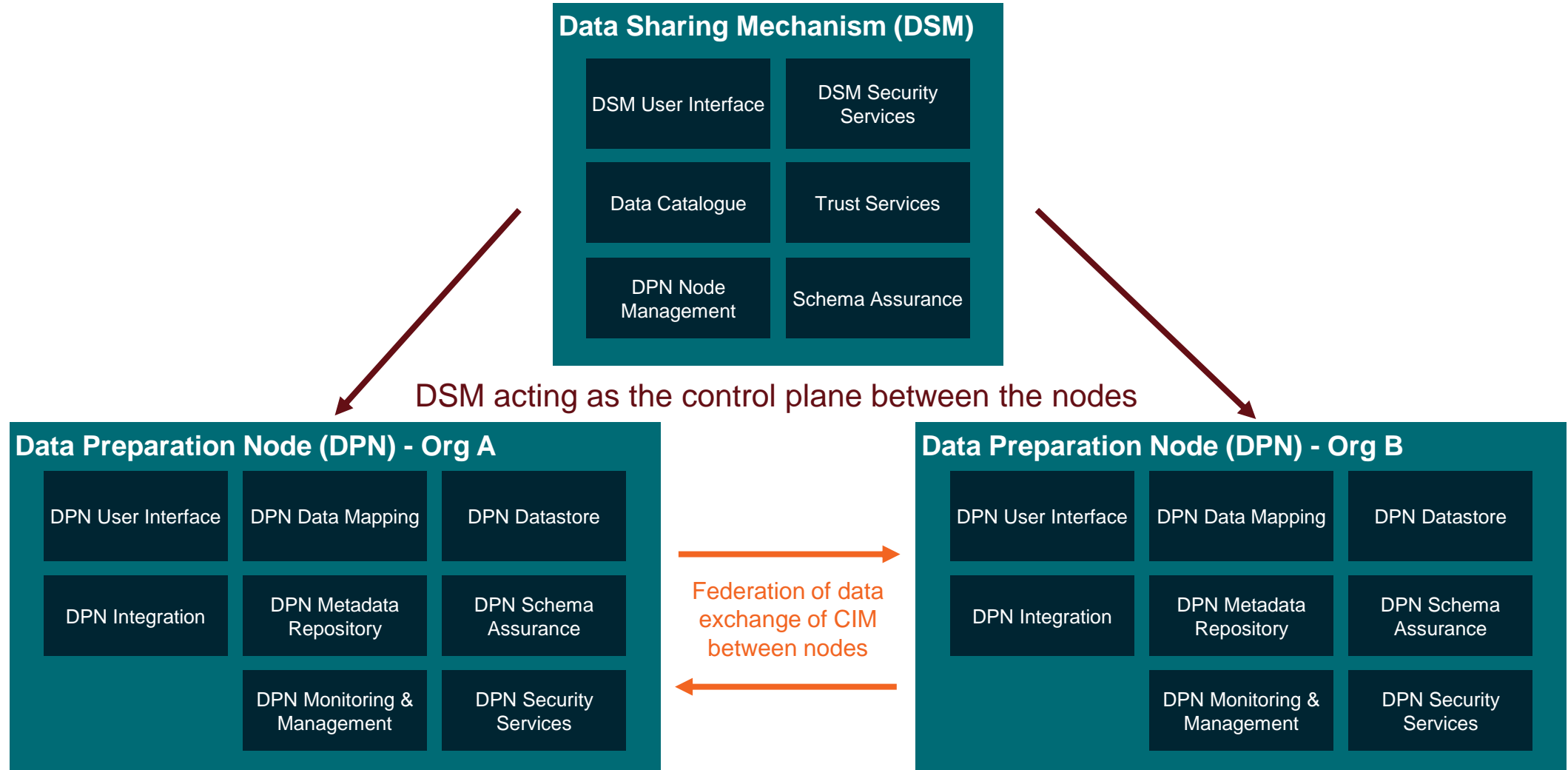


Data Sharing Mechanism System

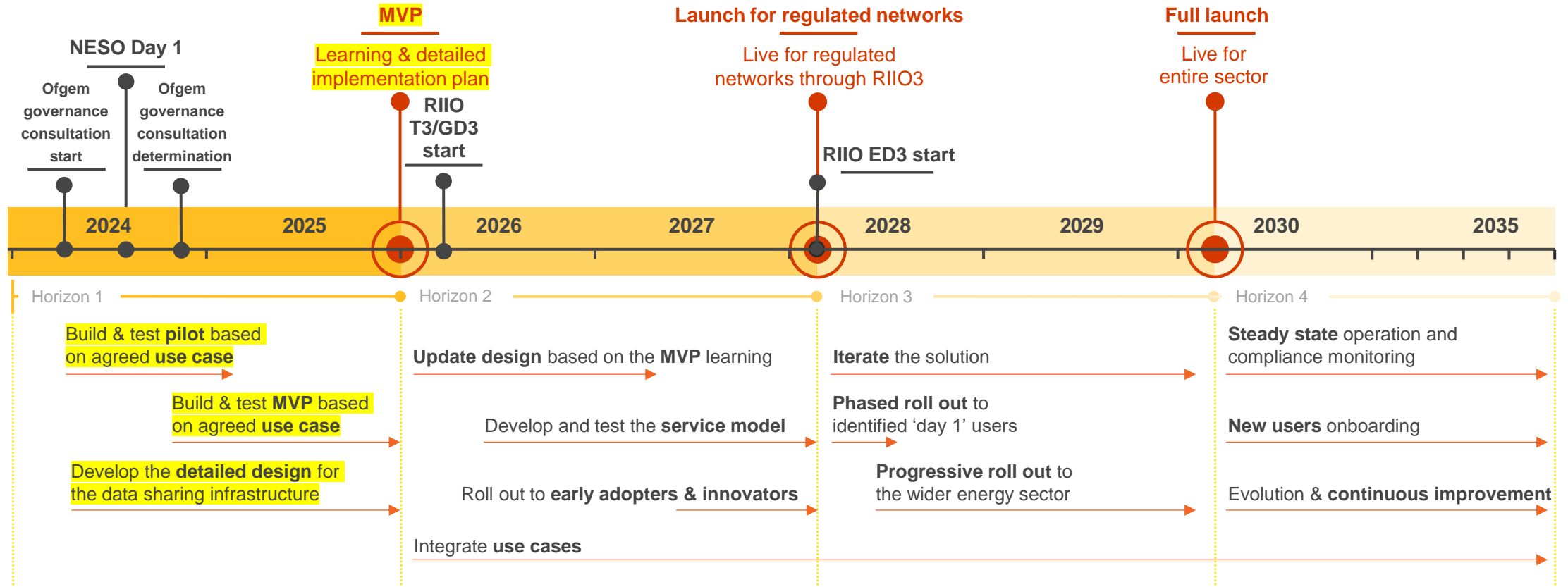
Data Sharing Mechanism (DSM)



Data sharing infrastructure interactions



High-level roadmap for delivery (2024-2035)



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

The logo consists of the words "Virtual Energy System" stacked vertically in a white, sans-serif font. The text is enclosed within a double-line yellow border that forms a square shape.

Virtual Energy System

Powered by ESO

THANK YOU
ANY QUESTIONS?

Please contact us at VirtualES@nationalgrideso.com

ESO

Open Balancing Platform Update

Item 7

Nisha Bhamidimarri / Mayank Jha

Topics to discuss

- OBP Roadmap Update
- Fast Dispatch
- How do other companies engage with their customers and industry to receive feedback and endorsement of priorities with a higher frequency of releases.

Open Balancing Platform Release Plan Timeline

#BPMarchWebinar2024

Legend

- Moved to an earlier date (no. of seasons moved)
- Moved to a later date (no. of seasons moved)

Summer 2024

Capabilities:

1. BM Quick Reserve

Enablers

1. Interface from Single Market Platform

Winter 2024

Capabilities:

1. New storage parameters
2. Bulk Dispatch Wind BMUs (rule based) [+2]
3. Constraint Management [+1]
4. Pumped Storage BOAs [-2]

Enablers

1. OBP Strategic – second Data Centre
2. Interface to Ancillary Settlement for NBM

Summer 2025

Capabilities:

1. NBM Quick Reserve
2. BM Slow Reserve
3. NBM Slow Reserve

Spring 2024

Capabilities:

1. Fast Dispatch
2. Balancing Reserve

Enablers

1. Support for Clock Change
2. Interface from SCADA for metering

Autumn 2024

Capabilities:

1. Manual instructions [-4]

Enablers

1. Interface to Data Analytics Platform

Spring 2025

Capabilities:

1. NBM Instruction Types

Enablers

1. NBM APIs
2. EDT/EDL mastered from OBP [+1]

Autumn 2025

Capabilities:

1. Move MW Dispatch
2. Move Response (DC/DM/DR)

Enablers

1. Ready to decommission ASDP

Abbreviations

EDT: Electronic Data Transfer DC: Dynamic Containment DM: Dynamic Moderation DR: Dynamic Regulation ASDP: Ancillary Services Dispatch Platform BOA: Bid Offer Acceptance

Fast Dispatch

Fast Dispatch (FD) went live in the Control Room on 30th April

Key function:

- Provide capability to the control room to dispatch quickly to a frequency deviation
- To be used in cases where immediate corrections to frequency are required

Compared to Bulk Dispatch Optimiser (BDO):

- BDO is designed to produce a solution within about 60sec
- FD is expected to produce a solution in <10sec
- FD runs close to real-time as possible
- FD currently ramps units within a minute
- FD requirement duration is limited to <10min

Points of interest

- Long NTO/Bs may not be dispatched at all (NTO/NTB > 1 minute)
- Units may be dispatched to their ramp-rate rather than their full capacity.
- Long MZT/MNZTs might not be dispatched unless units already on, or their sync/desync can be delayed or be brought forward.

Question: Fast Dispatch (FD) went live in the Control Room on 30th April

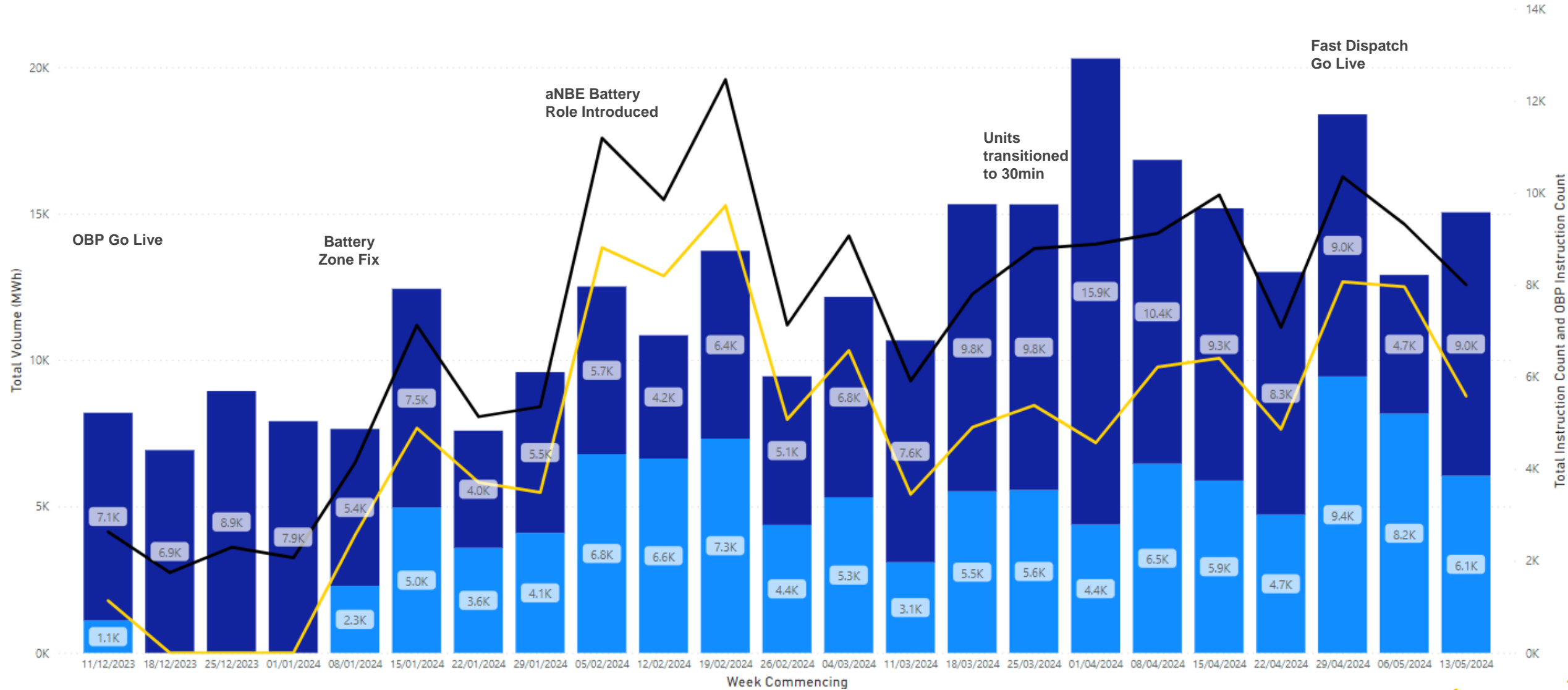
Abbreviations

MZT: Minimum Zero Time **MNZT:** Minimum Non-Zero Time **NTO:** Notice to Offer **NTB:** Notice to Bid

Batteries

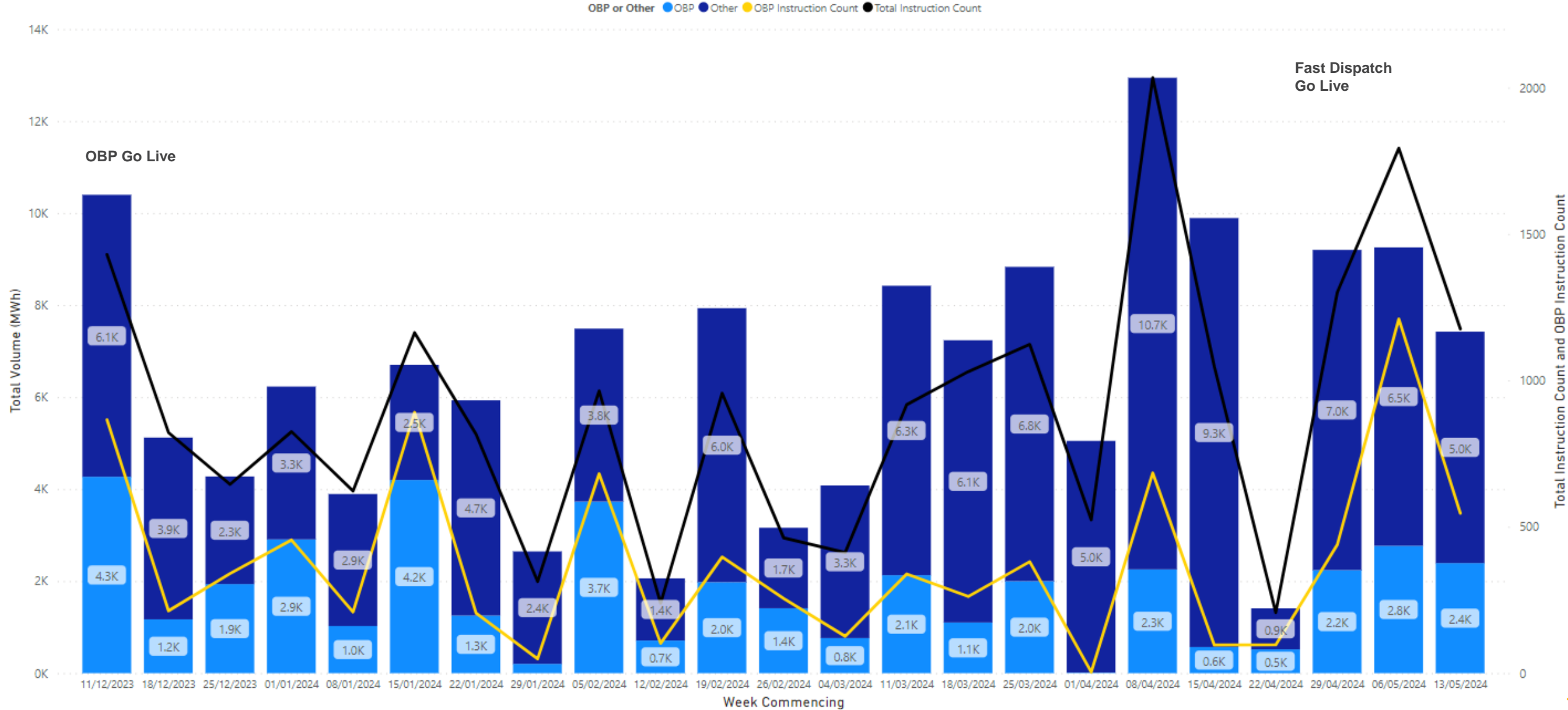
Absolute Volume MWh and Instruction Count by Date (Weekly) - Battery

OBP or Other OBP Other OBP Instruction Count Total Instruction Count



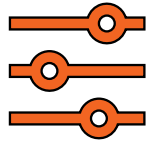
Small BMUs

Absolute Volume MWh and Instruction Count by Date (Weekly) - Small BMUs



OBP Release Philosophy

Until existing systems are fully decommissioned we have two types of release



- If an OBP release has a dependency on an existing system then OBP must align with the other system's release schedule
- If the release is fully managed within OBP we adopt the philosophy of "release on demand"
- OBP adopts continuous delivery (every two weeks following a sprint) and uses feature "toggles" to promote regular deployment and "release on demand"

Engaging with Industry

- The Balancing Programme continues to engage with Industry via our Quarterly Engagement event and has more specific discussions with stakeholder via our 4 stakeholder forums (Storage, Forecasting, Optimisation and Technology) which meet between our quarterly engagement events
- With a more frequent release cadence we are interested in knowing how other companies are engaging with their customer base and industry to receive feedback on release priorities? How often do you engage and what tools do you use for this?



Subgroups update

Item 8

Cameron Shade

Subgroups update

- Digital and Data Strategy held 12th April
 - Customer Experience
 - Digitalisation Strategy 6-month update
- Next meeting 12th July.

- Control Room of the Future held 17th May
 - Terms of reference
 - Discussion on future topics
- Main meeting date TBC but will be before Septembers TAC.



Next meeting

Item 9

Eric Brown

Next meeting and calendar

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

- 6th Sept 2024 – planned to be in person, location to be discussed.

AOB

Item 10

Eric Brown

Topics to discuss

- Learning from other sectors