ESO Technology Advisory Council

TAC-14

1st March 2024

Meeting pack

ESO

TAC-14 agenda – 1st March 2024

Item	Start	Finish	Time	Item	Presenter	Notes
1	09:00	09:20	20	**Welcome & Apologies**	Chair	
2	09:20	09:25	5	**Minutes of last meeting and matters arising**	Chair	
3	09:25	09:30	5	**Feedback from the last meeting**	Cameron Shade	
4	09:30	09:40	10	**TAC You said, we did**	Cameron Shade	
5	09:40	10:10	30	**Digitalisation Strategy**	Joseph Stepney	
6	10:10	10:40	30	**DevSecOps transformation**	Vinesh Lakhani	
	10:40	11:00	20	**BREAK**		
7	11:00	11:30	30	**FSO**	Brian Nixon / Colm Murphy	
8	11:30	11:50	20	**Open Balancing Platform Update & Roadmap**	Brendan Lyons	
9	11:50	11:55	5	**Subgroups update**	Chair	
10	11:55	12:15	20	**Next meeting**	Chair	Next meeting: Friday 7th June 2024
11	12:15	12:30	15	**AOB**	Chair	

Welcome and apologies

Item 1

Chair

Minutes of last meeting and matters arising

Item 2

Chair

Minutes of last meeting and matters arising

- Minutes of TAC-13 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.

Feedback from the last meeting

Item 3

Cameron Shade

Feedback from the last meeting

The topics discussed at the last meeting were:

- Innovation: Horizon Scanning
- Network Control Management System
- Common Data Framework
- Open balancing platform

Open Balancing Platform
• OBP go live date was confirmed at an industry event • OBP event was well received by members of the TAC's teams

Common Data Framework	Action Taken Since
• How will data going into VES be validated to ensure accuracy? • Governance is not a way to achieve anything quickly • Focus should be on the problem trying to be solved, who needs the data and where can they find it	• Data accuracy has been considered as a major component to include in our MVP • Continuing to look at governance and have invited Ofgem and DESNZ to our workshops to help inform their thinking with their digitalisation governance consultation later this year

Innovation: Horizon Scanning	Action Taken Since
• Telecoms should be more prominent in our technology horizon scanning, there has been huge progress in last 15 years • Data engineering capabilities will be critical and should be an area we monitor for advancements	• This fed directly into our prioritisation of research topics for 2024 and were well-aligned with advice from other external experts

Network Control Management System	Action Taken Since
• Questions on how dependent this was on VES • Suggestion that interfaces should be kept to a minimum as the more you add the more complicated it becomes • Multiple offers from TAC members for offline assistance	• We are just about to sign a proof of concept with GE and their newly acquired partner, Greenbird, for a data integration technique that will help manage the number of interfaces more effectively

TAC You said, we did

Item 4

Cameron Shade

Survey Responses from May 2023 and what has happened since

Key Survey Feedback	Action Taken
More frequent updates from Markets	Presentations on Crowdflex and Customer centric ESO (CRM) since but we can bring more
Multiple Requests for occasional in person meetings	Septembers TAC was in person. Our intention is to try this once a year
Ability to collaborate offline – Slack / Teams / Notion / Linkedin	We have had discussions on how best to do this but have not achieved it yet
More engagements between meetings via subgroups and deep dives	We restarted the control room of the future subgroup & started a new Digital & Data strategy subgroup to have more detailed discussions
Consider how we can utilise other members of your teams effectively	Many members of the Digital and Data strategy subgroup have been found as suggestions from your wider teams
Utilise TAC more in an advisory capacity before decisions	Feedback during the Jan Digital and Data strategy subgroup thanked ESO for asking directly for opinions on active decisions on Digital Quotient

Key advice & actions

Key Lessons	Feedback
Continuing learning from other sectors and industry initiatives	We continue to work with universities and through horizon scanning in our innovation teams engage with other industries, conferences & organisations
Implementation of a Product based OpModel & Agile delivery approach	DAP is piloting a Product Based OpModel showing benefits including a reshaped product roadmap delivering continuous customer value, eliminating wasteful effort and driving a cross-functional mind-set
Internal change throughout project lifecycles, focusing on people, processes & technology	Delivery governance progressing well with iterative improvement, recently automated to utilise live data instead of manual packs
Work to resolve problems instead of finding uses for technology	55 roadshows have taken place within the organisation to improve communication and educate on how to engage with DD&T to identify and resolve pain points and problems.
Improving communications & engagement	Improved transparency of the Open balancing platform with direct feedback from TAC members. Additional subgroups for more detailed discussions
Increased need for collaboration between technology & operational teams	Over BP2 our collaboration has improved consistently between our internal teams however we aren't easily able to meet the suggestion of embedding technology teams within the control room for long periods
Improved Data harmonisation	A data catalogue and common information model is being created using common terms to ensure consistency in usage and context.
Viewing transformational projects not just as technology projects	Developing Digital Charters in collaboration with business teams and DD&T to automate and Digitalise

Digitalisation Strategy

Item 5

Joseph Stepney

Topics to discuss

- How do we best engage with partners on our Digital Charters (particularly where we can demonstrate or illustrate operational transformation)?
- Are there any specific areas for charters we should be considering?
- Feedback and advice on RESP/SSEP charter:
  - Are we being ambitious enough for the longer term?
  - Are there any specific technologies we should be focussing on (Geospatial, Blockchain, AI)?
  - Examples of best/leading practice in data sharing and/or strategic planning?

The role of digital charters

- Our Digitalisation Strategy outlines how we will become a Digital Leader and drive collaborative digitalisation of the whole energy system.
- To achieve this, we as the ESO, through the FSO transformation and then as the NESO have outlined our digital principles.
- At the heart of our principles is our Digital Culture which we need to adopt as a whole organisation to transform the way we think and work.
- We will define and use Digital Charters as a key tool in delivering our strategy.

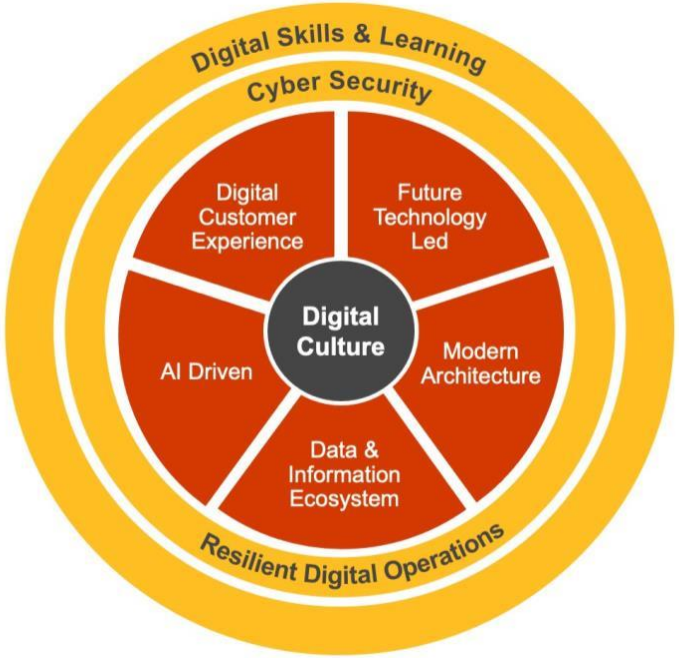
Digital Charters

- Digital Charters are designed to be digital "mock-ups" that provide a vision for each key business area and specify the roadmap to achieve out comes taking a digital first approach.
- Charters provide a method of demonstrating what being a Digital Leader means to our staff, customers and partners.
- We have identified an initial set of digital charters covering everything from new roles and internal business objectives including:
  - Customer (business priority)
  - Regional Entergy Strategic Planning (RESP) and Strategic Special Energy Plan (defining and developing new role)

The Strategic Centre: Digital Culture is at the core of our Digital Leader ambition. To effectively operationalise our strategy, we need to align our culture on reinvention through digitalisation and digital and data tools, rather than digitisation.

The Accelerators: Branching off the strategic centre are our Accelerators which facilitate how we deliver the strategy.

The Enablers: Surrounding our Accelerators, these elements must be considered in all decisions regarding digital, data, and technology processes.



Example charter (RESP/SSEP)

Early engagement with these developing roles will ensure a Digital First approach

Digital Leader:
Embeds digital in every aspect of the business and operates with continuous digital reinvention, facilitating digital collaboration within and beyond the industry.

Digital First:
Integrates digital into every aspect of the business, thinks digital beyond the ESO and for the industry, thinks digital beyond existing technology.

Context of the Challenge

ESO's mission for Strategic Planning is to provide an innovative solution to ingesting, capturing, storing, and visualising the special Data required by the ESO value streams known as SSEP, RESP and CSNP.

1. **Strategic Spatial Energy Planning (SSEP)** - a spatial energy plan that sets out what needs to be built, where, and when to deliver on 2035 targets. It is part of a wider landscape of planning reform aimed at accelerating network investment, including connecting offshore wind.

2. **Regional Energy Strategic Planning (RESP)** – Energy planning that regionally coordinated across energy types and between geographies with the right level of local input into the process as well as providing regional democratic oversight.

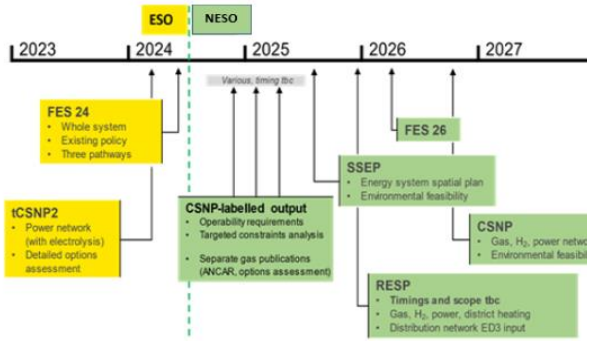
3. **Centralised Strategic Energy Planning (CSNP)** - Considers the GB onshore and offshore electricity transmission networks as well as cross-border electricity interconnectors and offshore hybrid assets and make recommendations on how the system should develop to decarbonise the electricity system by 2035. As the initiative matures it will then perform the same role for all energy types.

Digital Principles

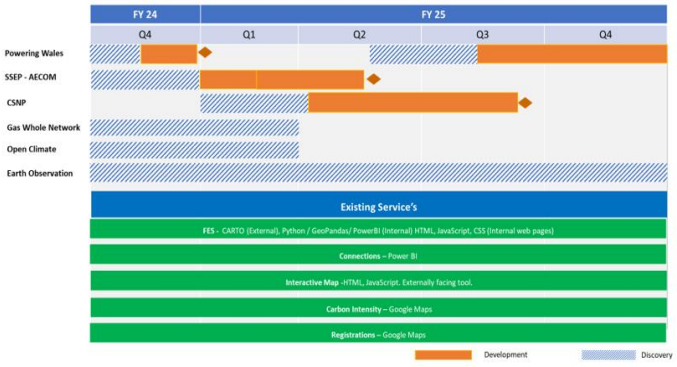
1	Data driven planning	Integrate robust data collection, analysis and modelling tools to inform planning decisions across SSEP, RESP, and CSNP. This includes geospatial data, energy consumption patterns, grid performance data, and renewable resource potential.
2	Transparency and Accessibility	Ensure open access to relevant data and planning documents for stakeholders, fostering public engagement and informed decision making. Utilise digital platforms for transparent communication and collaboration.
3	Standardisation and Interoperability	Promote use of standardised data formats and communication protocols across planning processes and stakeholder groups. This enables seamless data exchange and integration between planning levels and tools.
4	Cybersecurity and Data privacy	Implement robust cybersecurity measures to protect sensitive data and infrastructure. Respect data privacy rights and ensure responsible data governance practices.
5	Digital skills and capacity building	Invest in training and capacity building initiatives to equip stakeholders with necessary digital skills to effectively participate in SSEP, RESP and CSNP processes. Embrace digital technologies and data responsibly and inclusively.
6	Innovation and futureproofing	Encourage exploration and adoption of emerging digital technologies as AI, blockchain, and digital twins to optimise planning, decision making and grid operations.
7	Public engagement and Trust	Utilise digital tools to facilitate meaningful public engagement in planning processes, fostering trust and social acceptance of energy infrastructure development.

	Strategic Spatial Energy Planning	Centralised Strategic Network Planning	Regional Energy Strategic Planning
Full Ambition	• Vectors in scope include electricity, hydrogen and gas • Capacities, locations & timings • Supply, demand and high-level network needs co-optimised • Government inputs & endorsed by Government and Ofgem • Strategic Environmental Assessment (SEA) • Status in planning • Input into CSNP	• Scope includes all networked energy • Electricity and hydrogen systems completely co-dependent • Consideration of liquid fuels • Transmission, onshore and offshore	• 10-13 regional energy plans across all energy vectors developed with local stakeholders • Plans inform distribution network price controls • Regional plans are consistent with national plans
Day 1	• Full ambition but focusing only on electricity and hydrogen, and only on large supply & demand	• Electricity: transmission network options, strategic demand • Gas planning: independent view of pipeline system • Hydrogen: electrolysis & location, pipes, storage	• Detailed design for RESP is taking place in 2024 and there is no day 1 capability.

High level roadmap



Known and imminent GIS solutions Roadmap



Example charter (RESP/SSEP)

Example initiatives for we will deliver digital first for RESP/SSEP (this is currently in development)

Initiative 1: Digital Planning Capability

Challenge

The ambition to create a whole energy system plan is a new requirement for ESO, it is critical for customers to have access to the information that the require to make network investment and market change decisions. Without a plan, decision making is hindered, in turn inhibiting progress towards net zero.

Digital Ambition

We will present planning outputs on an interactive map of Great Britain, allowing customers to access the specific geospatial information that they require consistently across RESP, CSNP and SSEP, providing the data and digital tool required to optimise decision making. Processes will be automated where possible, and the digital planning capability will be continually assessed against emerging technologies such as distributed ledgers (blockchain), decentralised identities, artificial intelligence and digital twins to assess how we can drive more value for customers.

Benefits

- Optimised and automated decision making provide clear signals for network investment at a regional and national level.
- Automated processes will remove the risk of manual error.
- Increased transparency of data and decisions will lead to better customer outcomes.
- The potential for integrating emerging technologies will ensure the solution is futureproof.

Initiative 2: Digital Tools

Challenge

There is currently no single solution for engaging with stakeholders and customers or to display whole system information for strategic planning. As a result, there is a lack of simple and clear outcomes for customers, who become frustrated by the inability to self-serve information that would inform their investment decisions.

Digital Ambition

We will introduce visual insights with interactive maps to the levels of locational accuracy required by the differing needs between RESP, CSNP and SSEP. Scenario Planning and ‘what if’ analysis will be enabled including market frameworks / arrangements and the flexing of different parameters.

Benefits

- Customers will have self-serve access to the simple and clear outcomes needed for effective investment decisions.
- Tooling can scale to support both the new planning capability and existing capabilities e.g. Future Energy Scenarios.
- The engagement tool will share information with external stakeholders securely, protecting information and data.
- ESO will be able to process larger more complex information and display it in a simple, visual format for stakeholders.

Initiative 3: Scalable Data Platforms

Challenge

The ability to optimise decision making and share data transparently with customers is currently inhibited by the current capabilities of data platforms and processes. Data is obtained from multiple sources in disparate formats, there are gaps in the data that is required to support RESP, CSNP and SSEP, and the amount of data to support strategic planning is expected to be beyond the current capabilities of data platforms. Without addressing these challenges we would be unable to deliver on the ambitions for Strategic Planning.

Digital Ambition

We will have a single, scalable data store for incorporating large data sets in differing formats, and manipulating the data between open platforms and storage for historical usage and needs. The platform will be secure and accessible to multiple user groups, both internal to ESO and external. We will incorporate a capability for capturing customer feedback and information and provide the output of our analysis on this data.

Benefits

- The data store will allow interoperability across capabilities, including existing capabilities e.g. Future Energy Scenarios.
- We will be able to share data transparently internally and externally when it is needed based on classification.
- Data will be continually updated, enabling decisions to be made based on the latest data

.

- Data will be hosted on secure and resilient infrastructure.

Initiative 4: People and Process

Challenge

Internal ESO teams, external customers, and stakeholders will all require the appropriate skills and training in order to make the process of performing planning activities accessible. Users and customers must be empowered to self-serve to optimise their data. We also need to ensure the right people have access to the right data and tools.

Digital Ambition

We will create an inclusive digital culture focused on People and Process, enabling environments to support training and customer requirements. We will provide the tools and processes to support effective knowledge management, and monitor analytics data on training and site usage to understand who is accessing the information and how they are doing so.

Benefits

- All users will have access to the skills and training required to participate in strategic planning activities.
- There will be a single source of the truth for information related to planning tools and processes.
- Customers will have easy self-serve access to a well-managed planning service catalogue.
- The toolset can be continually refined to ensure they remain fit for purpose against evolving requirements.
- A single tool will reduce time, cost and errors caused by inconsistent assumptions.

DevSecOps Transformation

Item 6

Vinesh Lakhani

Topics to discuss

- Seek your guidance on our plans to scale DevSecOps and any additional tactics you recommend to accelerate our efforts
- Ask if you have any suggestions on best-in-class implementations of Developer Hub (automating developer onboarding) and share experiences (e.g. lessons learned, driving developer adoption, etc.)

Update on our DevSecOps progress so far, and our plans to scale through our strategic partner

	DevSecOps – Target State	OBP Proof Points	Scaling Plans
Culture	• Cross-functional teams, collective customer first focus & cohesive collaboration • Shift-left & culture of shared responsibility to embed quality, reliability, security & compliance earlier and often in the development process • Test & behaviour driven development • DevSecOps & SRE culture and mind-set • Increased team happiness & well-being	• Implementation of technical squad leads to break down silos between Dev & Test • All squads practice Test Driven Development • First true pioneering SRE culture **Increased quality & reduced lead time for changes**	• Well defined development & blended learning approach to uplift DevSecOps capability & skills • Training programs, immersive sessions, roleplays & team swaps to address cultural & mindset aspects of DevSecOps to realise true value • T-shaped squad topology design & unification of a squad's collective focus through OKRs that interlock cross-departmental KPIs **Increase DevSecOps maturity & adoption** **Increase customer value & delivery quality**
Automation	• Automated provisioning, config, deployment, scaling (up & down), tooling, policy application (x As Code) & controls • Automated build, test & release on demand • Automated post deployment testing / continuous validation & (if needed) rollback • Real-time A/B testing in production (or close as possible) (e.g. through feature flags) • Automated traceability & reporting	• New test automation framework • Fully automated release notes on deployment for complete release governance. **Test time: 1min 22secs (previously 40mins)**	• Globalise automation assets (e.g. test automation framework, pipeline config, policy as code, infrastructure as code, etc.) to roll out across other archetypes (incl. cloud-native) • Automate manual steps and blockers that disrupt the throughput of value • Automate provisioning of golden paths across archetypes (environments, tools, pipelines, controls, etc.) **Increase speed to value (cycle time)** **Reduce fragmentation & increase consistency**
Measurement	• Automated DORA & FLOW metrics & reporting • Observability metrics for data driven decisioning and shift to AIOps & FINOps • Real-time vulnerability management and notification feedback at point of introduction (e.g. dynamic visualisation in developers IDE)	• Automated DORA dashboard • Comprehensive test automation moving us forward towards Continuous Testing **Deployment frequency: 57** **Lead time for changes: 1hr (to SIT)**	• Roll out DORA, FLOW, observability metrics to drive data decisioning, course correction & resource cost optimisation across key archetypes • Gamify adoption & optimisation (e.g. leader boards) • Integrate real-time vulnerability detection (e.g. within developer IDE) **Increase engineering performance** **Increase stability, reliability, quality, security**
Sharing	• CoE/Ps, playbooks, learning sessions, live examples, & immersive sessions to cross-pollinate & share best practice / innovation • Discoverable & codified reusable assets to increase developer productivity & standardise • Self-service automated provisioning (golden paths)	• Comprehensive playbooks created • Test reporting server standardised & available to other teams to use • WoW connect sessions to share TDD & automated testing best practice **WoW connect sessions attendance consistently over 110ppl**	• Established CoE/Ps, guilds & mentorship programs to embrace continuous & organic sharing and learning • Implementation of a Developer Hub to easily discover golden path artefacts, (micro)services, dependencies, playbooks & automatically self-provision pre-configured developer needs at a click of a button **Increase developer productivity / velocity** **Reduce developer onboarding time**

Developer Hub will be our one stop shop for developer self-service; increasing developer productivity and speed to developer value

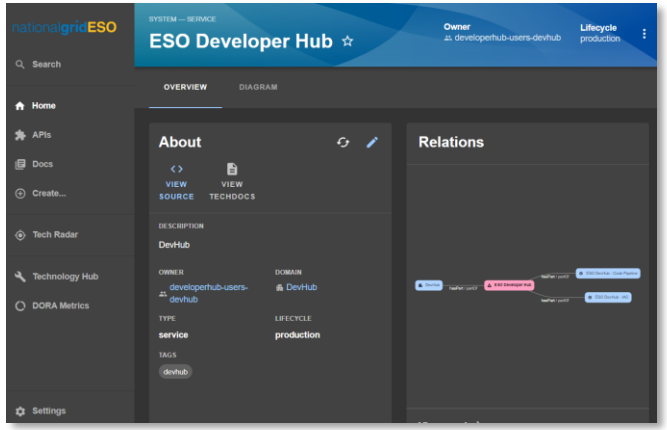
As we progress towards our target state architecture, our micro(services) and developer tools landscape will grow. With that in mind, we have already started our journey to build out our Developer Hub to maintain control whilst maintaining developer autonomy.

Developer Hub key features:

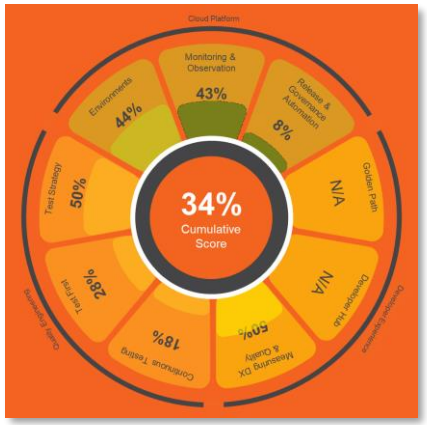
- Easy & effortless discovery:
  - A central place to find & share best practices, principles, playbooks, artefacts, tutorials, how-tos, API documentation, libraries, micro(services) owners & dependencies, tools
- Golden paths:
  - Standardised templates to build something (e.g. microservice, pipeline, etc.) with policies & controls baked-in
  - Self-service automated push-button provisioning (infrastructure, config, pipelines, tools, etc.)
- Adoption & gamification of Engineering Metrics:
  - Visual dashboards and healthy gamification to drive up adoption of engineering metrics
- Reduction of developer cognitive load
  - One stop shop for all developer needs

Key benefits of Developer Hub:

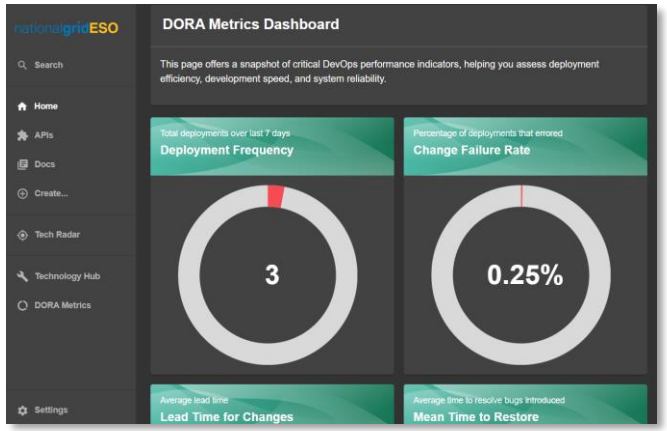
- Increase developer productivity & velocity
- Reduce developer onboarding time
- Standardisation across environments & tooling
- Increase speed to value & cycle time



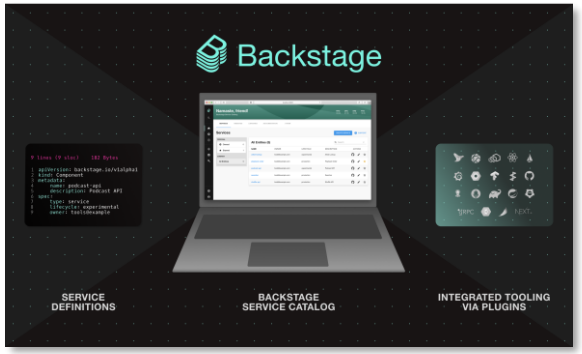
Example Developer Hub screenshot



Example engineering metric dashboard



Example Developer Hub screenshot



Powered by Backstage.io (Spotify Engineering / CNCF)

Note: Developer Hub / screenshots subject to UX treatment.

Break

10:40 – 11:00

FSO

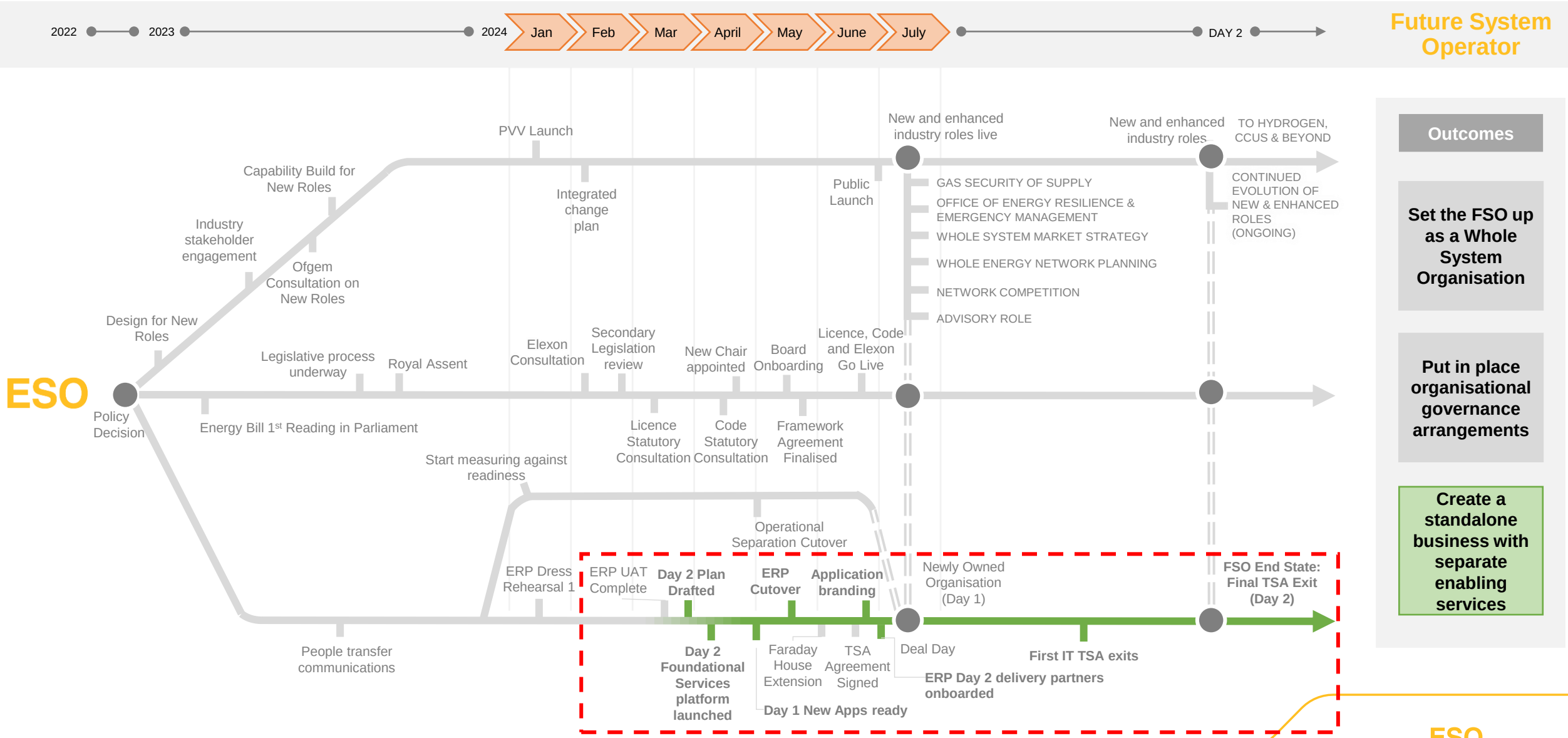
Item 7

Brian Nixon / Colm Murphy

Topics to discuss

- How do we best manage external engagement on ESO's Day 1 to Day 2 technology transformation?
- Gather your feedback and input on how best to manage external communications regarding the 'hard freeze' for operational separation

ESO to FSO Look Ahead



Outcomes

Set the FSO up as a Whole System Organisation

Put in place organisational governance arrangements

Create a standalone business with separate enabling services

Open Balancing Platform Update & Roadmap

Item 8

Brendan Lyons

Topics to discuss

- The councils experience of Optimisation and the automatic conversion of the decimal MW values generated by the optimiser to instructions with integer MW values
- OBP Strategic Update

Roadmap published to Industry, November 2023

Winter 2023

Capabilities:
1. Bulk Dispatch of Battery Zone & Small BMU Zone

Enablers:
1. New IT platform in one Data Centre
2. Interface to/from existing BM system

Summer 2024

Capabilities:
1. BM Quick Reserve
2. Bulk Dispatch Wind BMUs (rule based)

Enablers
1. Interface from Single Market Platform

Winter 2024

Capabilities:
1. New storage parameters

Enablers
1. OBP Strategic – second Data Centre
2. EDT/EDL mastered from OBP
3. Interface to Ancillary Settlement for NBM

Summer 2025

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

Enablers
1. Pumped Storage BOAs

Spring 2024

Capabilities:
1. Fast Dispatch
2. Balancing Reserve

Enablers
1. Full support for Clock Change
2. Interface from SCADA for metering, alarms, indications

Autumn 2024

Capabilities:
1. Constraint Management

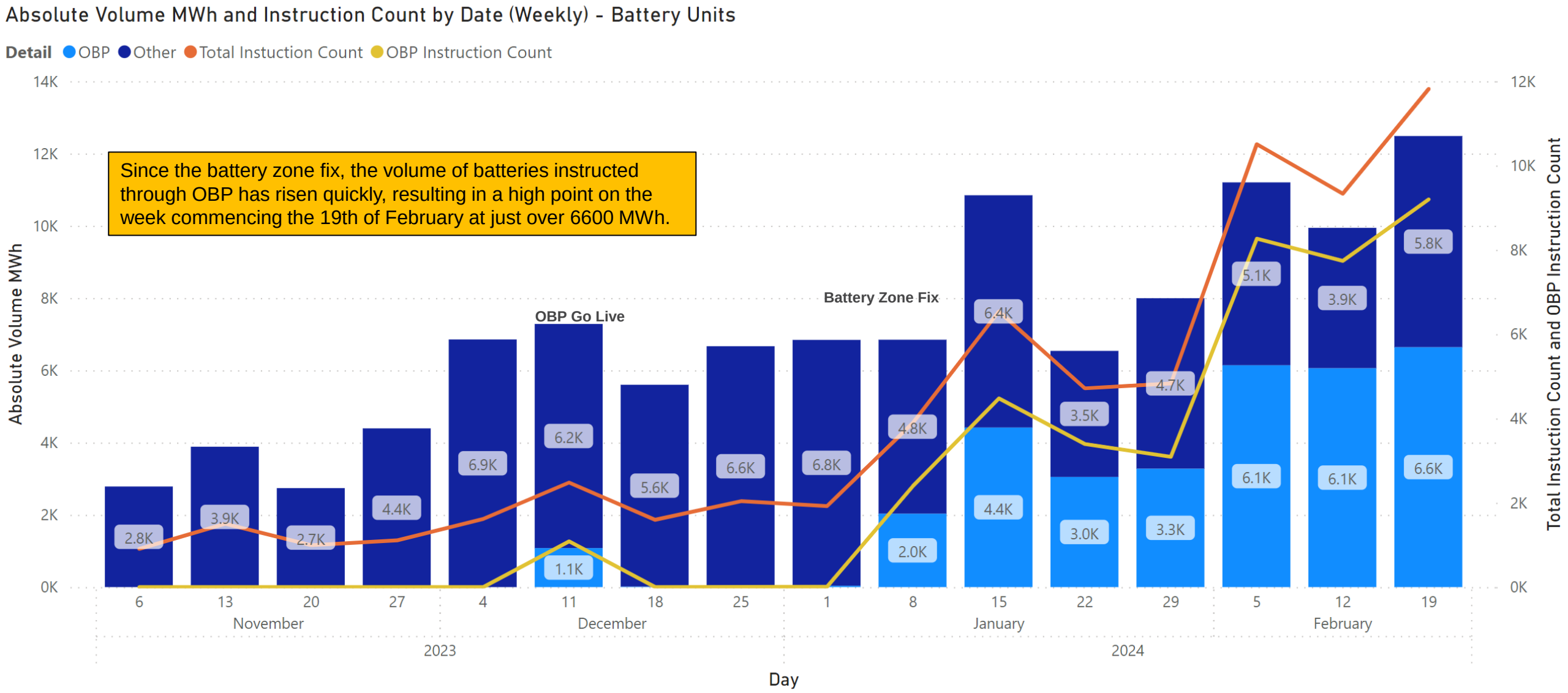
Enablers
1. Interface to Data Analytics Platform

Spring 2025

Capabilities:
1. NBM Instruction Types

Enablers
1. NBM APIs

Batteries – Absolute Volume and Instruction Count



What is your experience of optimisation and the automatic conversion of the decimal MW values generated by the optimiser to instructions with integer MW values

Subgroups update

Item 8

Cameron Shade

Subgroups update

- Digital and Data Strategy held 12th January
  - Industry knowledge transfer – Data professionals
  - Digital Quotient / Maturity
- Next meeting 12th April 24.

- Control Room of the Future held 25th October
  - New chair in place, planning next session and a regular cadence.
- Next meeting TBC.

Next meeting

Item 9

Chair

Next meeting and calendar

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

- 7th June 2024

AOB

Item 10

Chair