

A man with glasses and a beard is looking at a screen in a server room. The room is dimly lit with blue and purple lights. The man is wearing a white t-shirt with a palm tree logo. The background shows server racks and cables.

ESO Technology Advisory Council

TAC-10
3rd March 2023
Meeting pack

TAC-10 agenda – 3 March 2023

Item	Start	Finish	Time	Item	Presenter	Notes
1	09:00	09:05	5	Welcome & Apologies	Vernon Everitt	
2	09:05	09:10	5	Minutes of last meeting and matters arising	Vernon Everitt	
3	09:10	09:15	5	Feedback from the last meeting	Vernon Everitt	
4	9:15	09:50	35	Digital Strategy & Action Plan	Gary White	
5	09:50	10:05	15	2 years of the TAC	Cameron Shade	
6	10:05	10:40	35	Updates since Draft determination & Ofgem reporting framework	Mayank Jha / Gareth Davies	
7	10:40	11:00	20	Open Balancing Platform Update & Roadmap	Bernie Dolan	
	11:00	11:20	20	BREAK		
8	11:20	11:50	30	Data Analytics Platform update	Mark Limpkin	
9	11:50	11:55	5	Subgroups update	Vernon Everitt	
10	11:55	12:15	20	Next meeting and discussion about the future	Vernon Everitt	Next meeting: Friday 2 June 2023
11	12:15	12:30	15	AOB	Vernon Everitt	



Welcome and apologies

Item 1

Vernon Everitt



Minutes of last meeting and matters arising

Item 2

Vernon Everitt

Minutes of last meeting and matters arising

- Minutes of TAC-9 are out for comment via circulation and will be published once agreed.
- The material from the meeting will also be published.
- This section will be used to discuss any matters arising.



Feedback from the last meeting

Item 3

David Bowman

Feedback from the last meeting

The topics discussed at the last meeting were:

- Data – Following a data theme we discussed Data Governance, the data landscape, DAP and DEP.
- Open balancing platform – Progress update on PI 6
- RIIO-2 The Draft determination outcome

Feedback from the TAC:

Data

- Handling compromised datasets
- Machine learning for spotting problem data
- TAC members complimentary of ESO Open data initiatives as core users
- Consider how you design your KPI engine
- ESO culture regarding data is open and transparent

Open balancing platform

- Consider confluence as a technical library for versioning and commenting
- Particular solver algorithms may have transparency issues due to decision-making logic being buried
- Consider what organisations in other markets are doing.

RIIO-2 Draft determination

- Congratulations on full funding
- Cost monitoring framework sounds pragmatic
- Consider GPST consortium for KPI's and benchmarks

Digital Strategy & Action plan

Item 4

Gary White

Topics to discuss...

What do you see as the key outcomes for the digital strategy

Is the timespan of the strategy appropriate

How / Who have your organisations engaged with to develop your digital strategy

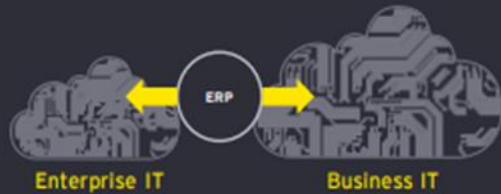
What do you see as the significant challenges in developing a digital strategy

Digital Strategy – Wider Context



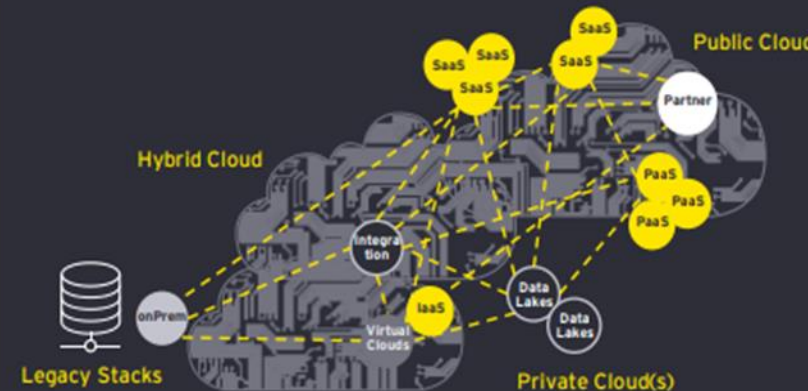
1. Conventional

Cost optimized, **separate business and IT** stacks, rigid and linear.



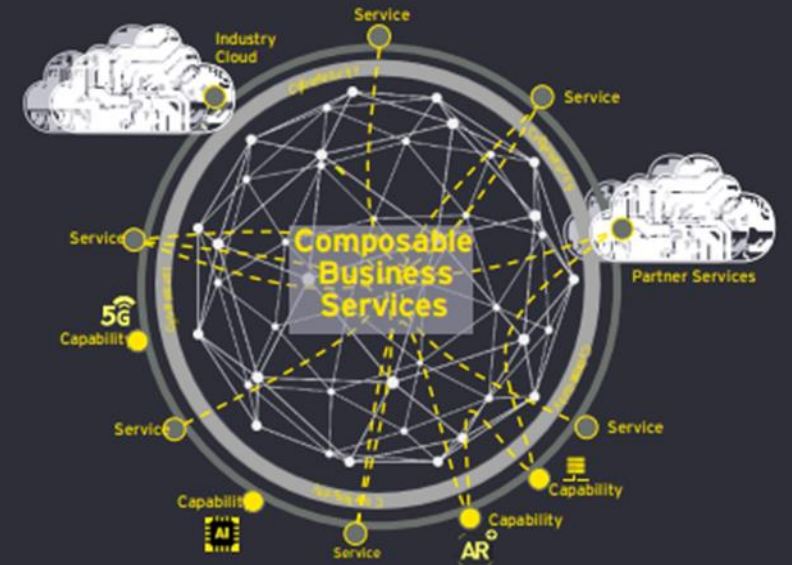
2. Hybrid

Current world Spaghetti architecture. Cloud services purchased to solve immediate problem with data from legacy systems. Delivered by digital factories.



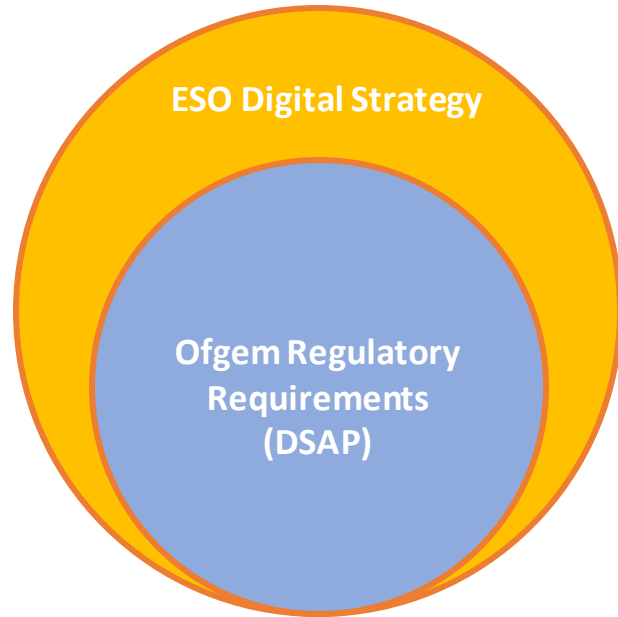
3. Digital by design

Composable business services, each component business aligned, responsive, adaptable, replaceable and flexible. Architected around data.



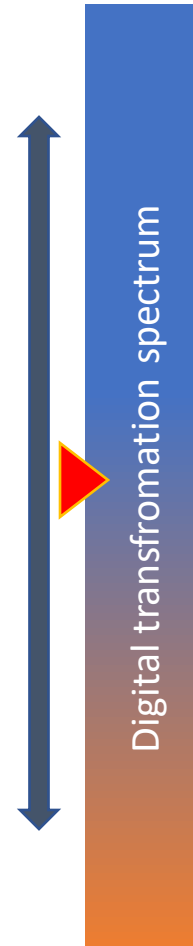
Digital strategy scope for ESO

What do we want to achieve through this refresh?



Is this a purely regulatory endeavor to satisfy Ofgem's immediate DSAP requirements, or does ESO wish to make this a broader exercise to review and refine ESO's overarching 'digital strategy' for the future?

How ambitious is the scope



Option 1:
Continuous drive to maturity

A strategy that outlines digital transformation across the full organisation driving fundamental change and restructuring to operations and business capabilities

Option 2:
Targeted change

A strategy that outlines targeted change in key areas where digital transformation can be fully applied and ESO can be successful e.g. new FSO business capabilities. Completed in parallel with technology enhancements to legacy estate

Option 3:
Legacy driven

Technology enhancements drive efficiency gains and support solution evolution (e.g. IEMS), but change fundamentally limited by ESO's existing operational structures and legacy estate

Digital Strategy Themes

Customer, Stakeholder, Regulator

- Customer centric
- Design-led and data-driven approach to create digital products and experiences iteratively
- Support OFGEM digital transformation

Open Data

- Organisation understanding and ownership of data transparency, accuracy and security, enabling self-service development and delivery of insights, value and decision making

Digital Eco-Systems

- Architecture and technology designs that adapt easily and rapidly to changes in business strategy and objectives , with business capabilities exposed as consumable services
- Cloud native design patterns and service delivery
- Standards driven open technology

Culture and Mindset

- Attract and develop digital expertise at all levels of the organisation creating the ability to execute on creation of digital products , services , design and deliver

Frictionless Operating Model

- Alignment of everything to maximise value delivery and outcomes

Digital Strategy – Ofgem Guidance

Expectations

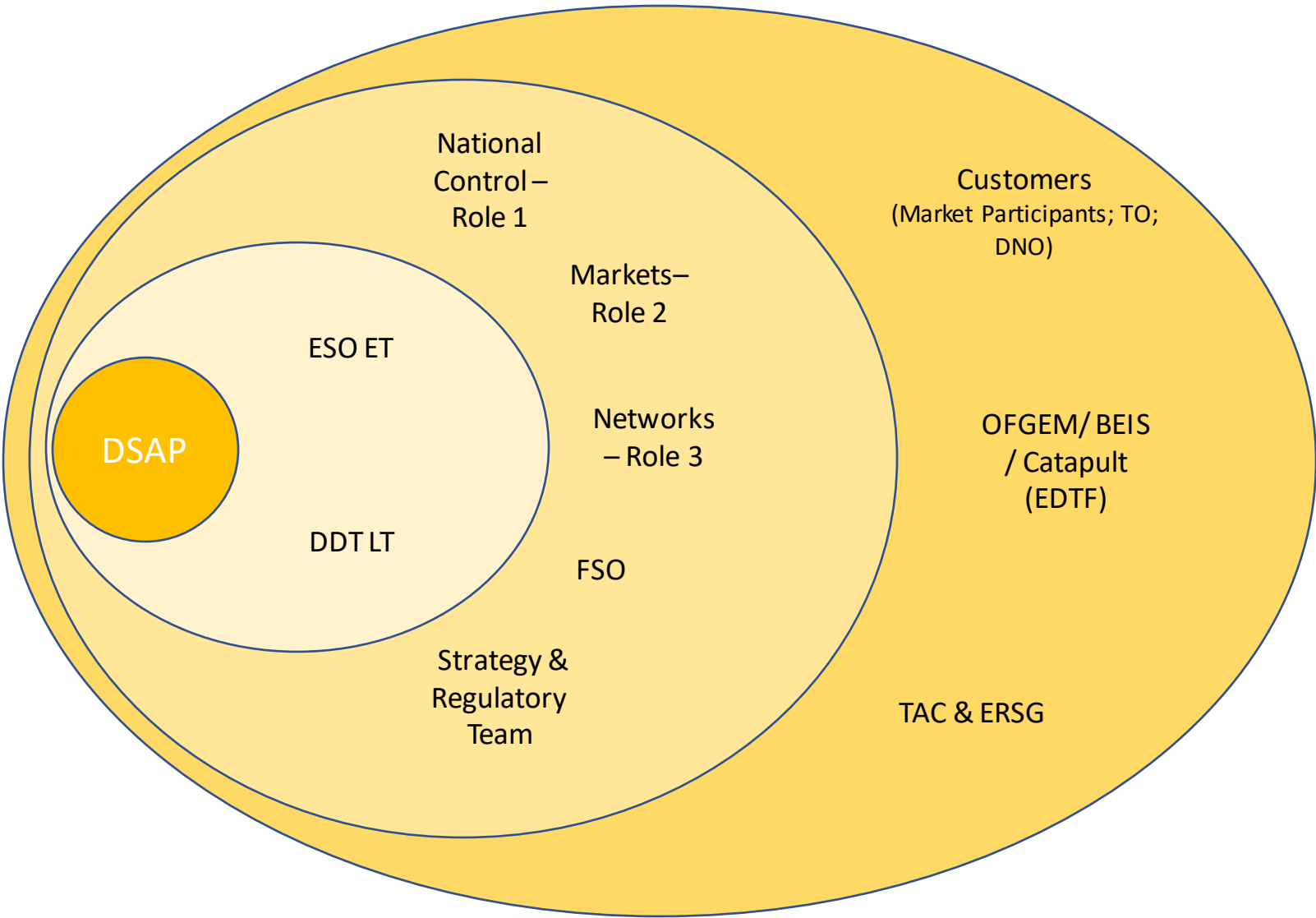






External Principles and Standards



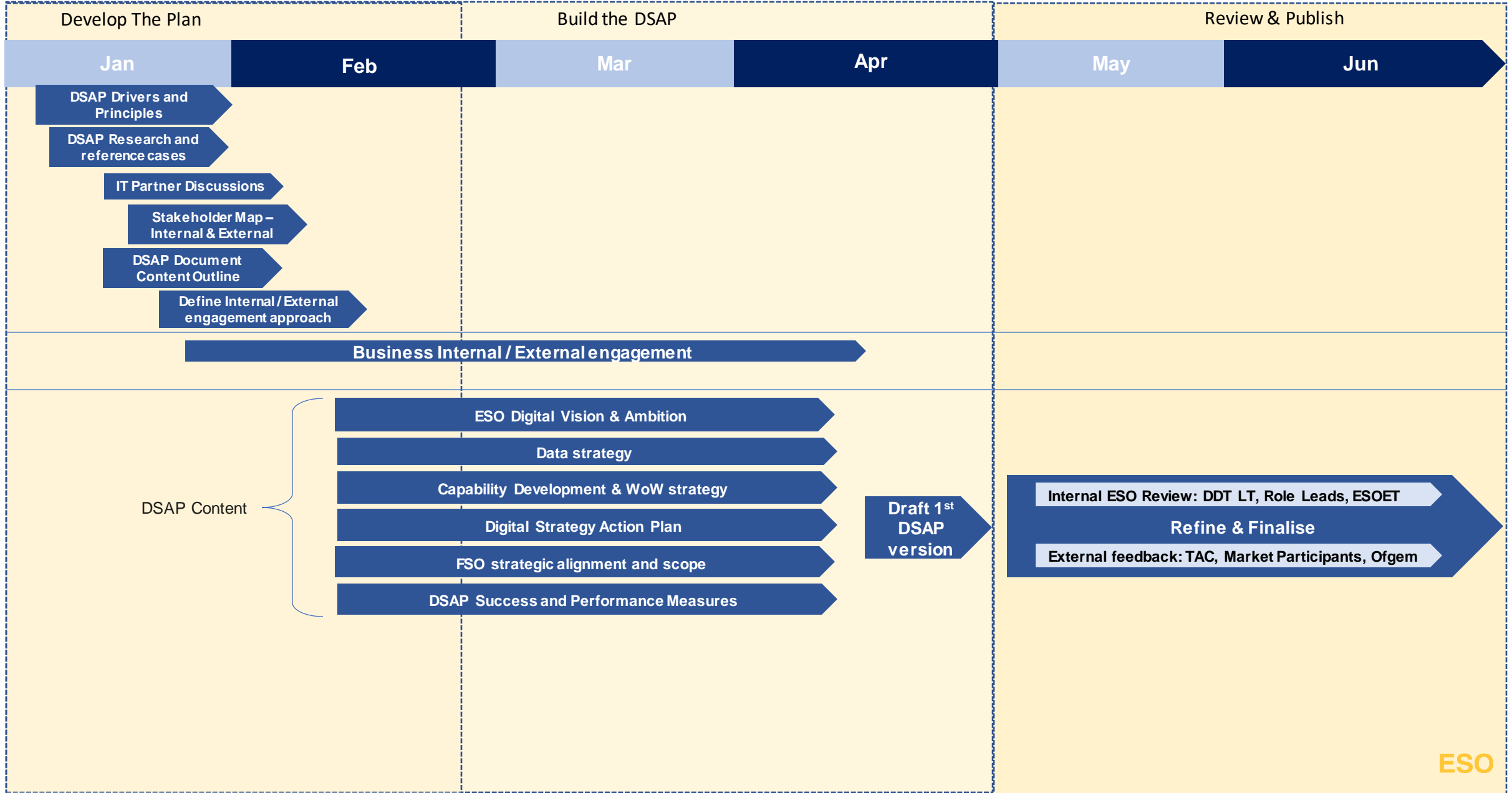
Digital Strategy

Stakeholder Map



-  DSAP Strategy
-  Organisation
-  Business Role
-  External / Stakeholder

Digital Strategy – Outline Plan – DSAP Publication





2 years of the TAC

Item 5

Cameron Shade

TAC in data

Thank you!

2 years

9 Meetings

73 presenters

21 members

52 Questions

1,770 Minutes

100+ areas of discussion

41 Actions

243 total attendees



What topics have been covered?

Roles
Data Governance
Stakeholder Engagement
Zero-Carbon Agenda
Transformation programmes
Digitalisation Strategy
Transition
Single Markets Platform
Balancing Programme
Networks
Enhanced Frequency Control
Collaboration
Digital Action Plan
Regional Development Programme
Agile Delivery
Learning from other sectors
Ways of Working
Data Strategy
Product Model
Working Groups
Data & Analytics Platform
RIIO-2 Business Plan
Customer & Stakeholder
Carbon Emissions Tracking
Digitalising Energy Sector
Digital Engagement Platform
Alarm Management
Network Control Strategy
Investment
New Sub-Groups
Regional Development Programmes

Key advice & actions

Focusing on delivering core-functionality that delivers well a more limited number of priorities:

Single market platform 7 releases in 1 year.

Created an automated API to replace 2 weeks of manual work

Continuing learning from other sectors

Continue to partner with universities on innovative solutions

Collaboration between Transmission & Distribution

Implementing the Regional development programmes in collaboration with the various DNOs

Implementation of a Product based OpModel & Agile delivery approach:

Network Control has strong collaboration with the business using a Product based Agile delivery structure

Internal change throughout project lifecycles, focusing on people, processes & technology

Governance framework rolled out for DDT programme delivery

Key Lessons & Feedback...



Linking up with industry initiatives

Using other initiatives like asset register to feed into our own implementation plans

Improving communications & engagement

Managing DAP work requests via a new Engagement Framework

Viewing transformational projects not just as technology projects

Ancillary service reform is meeting changing system needs by implementing three dynamic frequency response services

Increased need for collaboration between technology & operational teams:

Open Balancing Platform focusing on operational user feedback via regular engagement

Improved Data harmonisation:

Digital Engagement Platform provides a single point of access to ESO content sharing data both internally and externally.

Updates since Draft determination & Ofgem reporting framework

Item 6

Mayank Jha / Dan Delgado

Topics to discuss...

On a complex Hybrid portfolio, how have you married the variety of metrics to review?

Given the we fixed milestones and fixed budget, but agile delivery, do you have insights on how we manage sanctioning for projects?

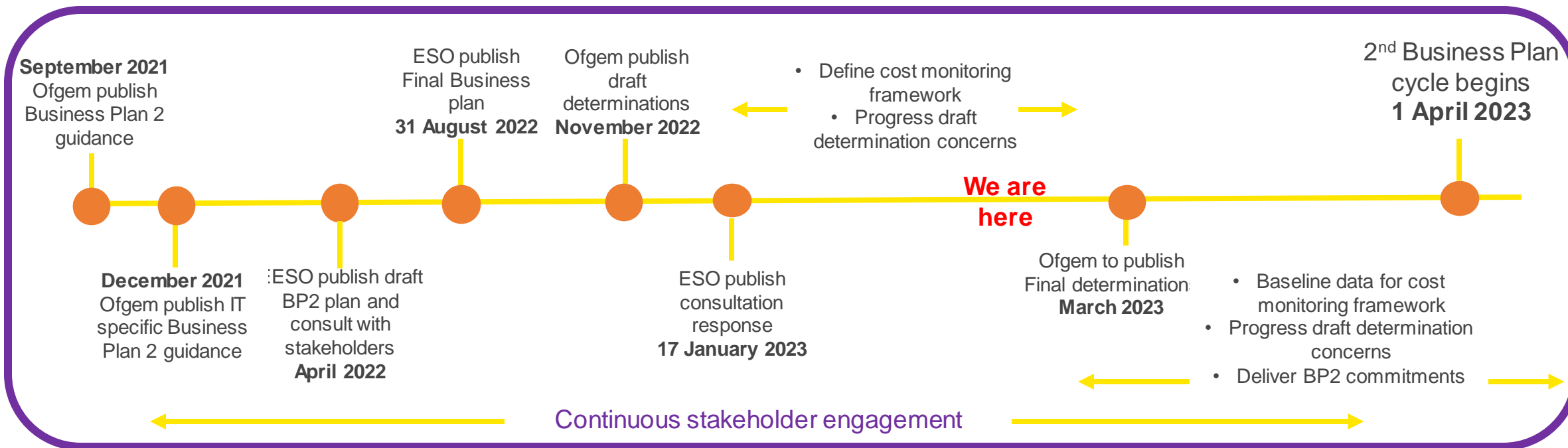
Do you have ideas on how do we embrace a fail fast culture under the constraint of regulated budgetary environment?

Business Plan 2 (BP2) and Draft Determinations

The RIIO-2 price control timeline



BP2 timeline

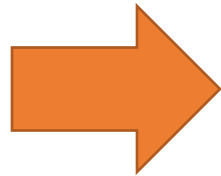


BP2 IT Assessment and Cost Monitoring Framework: Progress with Ofgem

We have been regularly collaborating with Ofgem to gain clarity on the approach to IT programme assessment during BP2 and agree a mutually beneficial Cost Monitoring Framework. Whilst good progress has been made discussions continue:

ESO's BP2 DD consultation response:

- We have confidence in the robustness of our technology plans.
- We challenged some of the Draft Determinations' technology assessment conclusions, providing additional evidence.
- We set out a timeline across BP2 to address all Draft Determination concerns.
- Whilst supportive of the Cost Monitoring Framework in principle, in our response we proposed how the cost monitoring framework and ESO DD&T assessment could be enhanced.



Progress with Ofgem since DD response. Key focus areas:

- 1. Maximising BP2 Final Determination outcome** – we are providing additional context and information on the key portfolio concerns of governance and CNI hosting. Whilst this will not move the Value 4 Money scoring, we are seeking a more positive tone on IT programmes and governance in the Final Determination.
- 2. Setting up a process to continue to collaborate and engage with Ofgem throughout BP2**
 - a. Gaining clarity on the BP2 IT assessment framework** – we held an exploratory workshop to collaborate and gain alignment on Ofgem's future IT assessment. This included understanding the mechanics of the IT assessment and how the cost monitoring framework will supplement this. We identified the need to:
 - Agree a set of guiding principles for future assessments
 - Understand and influence how Ofgem intend to carry out future assessments given resource and specialist knowledge concerns
 - Seek that the IT assessment framework be documented in Ofgem's formal regulatory document
 - b. Cost monitoring framework mechanics and data flows** – good progress has been made on definitions for delivery, cost and governance outputs.

Alignment of Cost Monitoring Framework to ESO's DD&T PMO Governance

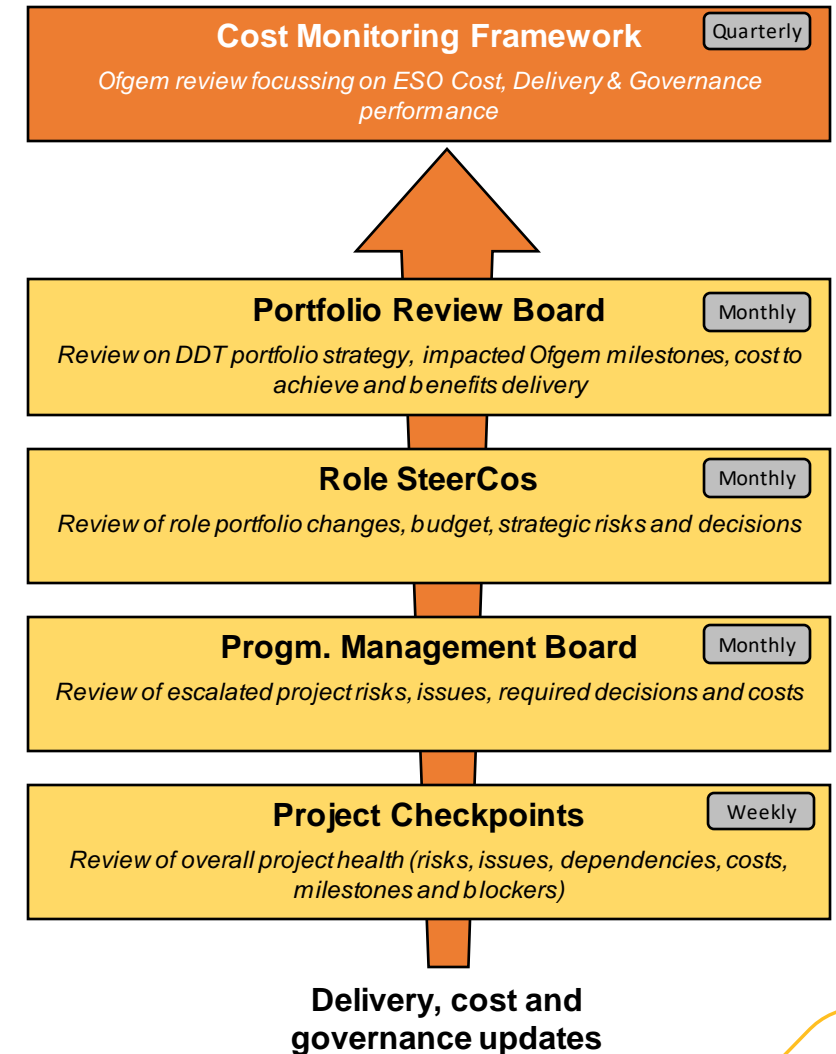
Whilst the mechanics of the Cost Monitoring Framework (CMF) are yet to be finalised, we have agreed with Ofgem that the framework will focus on three data areas across our technology investments:

- (i) Delivery performance – covering milestone delivery and feature backlog progress;
- (ii) Cost performance – a comparison of actuals vs forecast spending profiles p.a.
- (iii) Governance outputs – updates on delivery risks/issues and key strategic decisions

In order to align delivery to the creation of the CMF, we are currently pursuing the following:

1. **Clarity of scope** – holding regular weekly sessions with Ofgem to agree CMF data requirements, ESO feasibility, and prevent regulatory overreach
2. **Integrated assurance & reviews** – embedding regular reviews of project MI within our new PMO Governance structure and forums (see diagram, right)
3. **Automated Dashboards** – developing project MI dashboards acting as a 'single version of the truth' on ESO delivery across all levels (project, programme, portfolio) which are integrated into governance reviews
4. **PMO Assurance** – augmenting our PMO capability to enable additional analysis and interrogation of our MI data to drive further improvement
5. **Delivery team engagement** – ongoing engagement across delivery, business and Role-level executive teams to outline CMF requirements and coordinate preparation
6. **Cost reporting** – refining our cost reporting processes in readiness for the CMF reviews

Summary of how the CMF will integrate into ESO's existing PMO Governance Framework





Open Balancing Platform

Item 7

Bernie Dolan

Progress Update on OBP – Release 1.0

- Following the principles of Scaled Agile the new Open Balancing Platform is being developed using Program Increments (PIs)
- Each Increment is approximately 12 weeks long. We have completed PI6 (in October) and are now into PI7
- In PI9 we will make our first production release (Sept 2023 with a contingency date of Dec 2023)

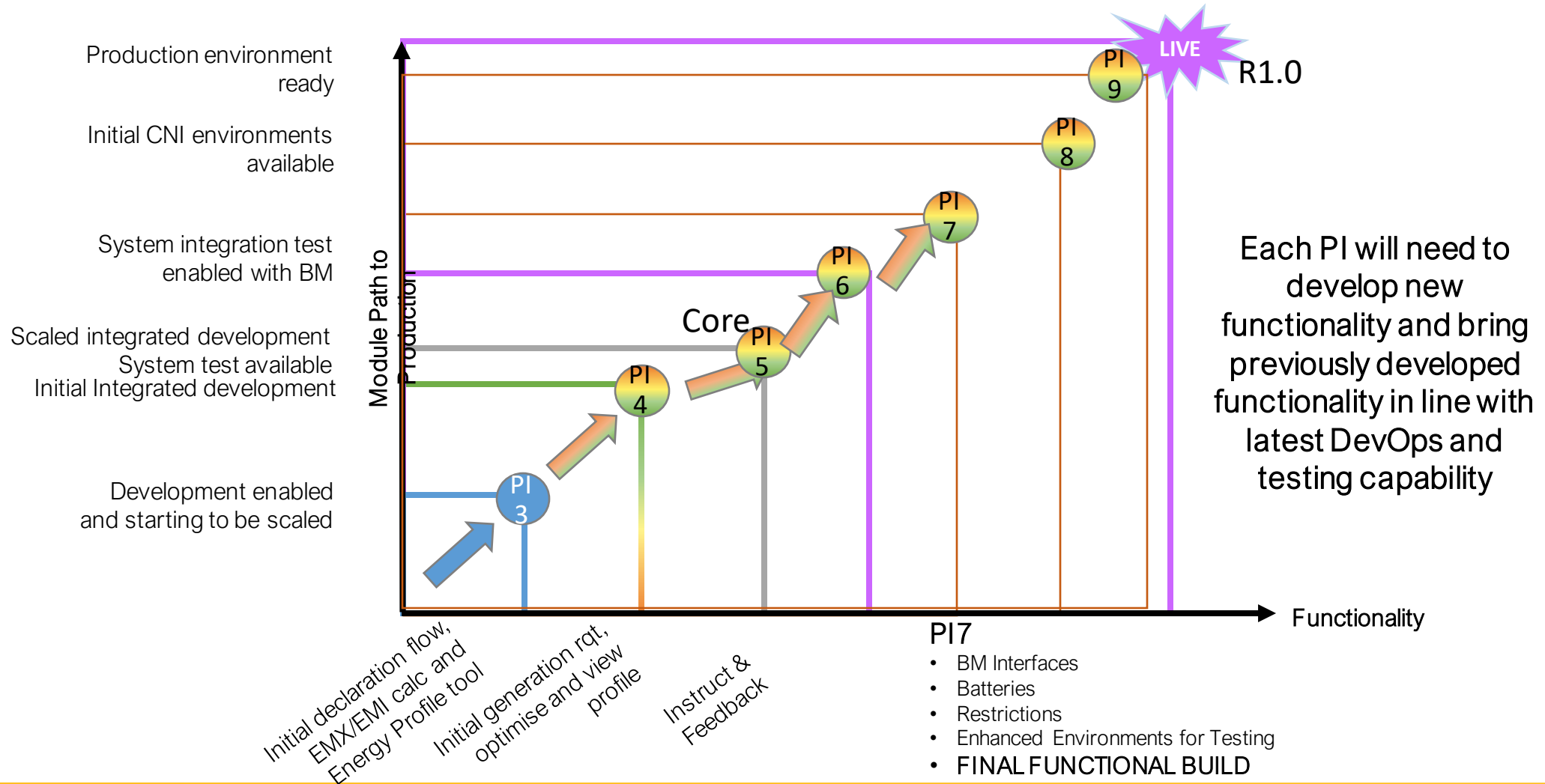
GOAL

A Zonal Balancing Engineer will be able to bulk dispatch fast acting units (“Small BMU” zone) without breaking constraints

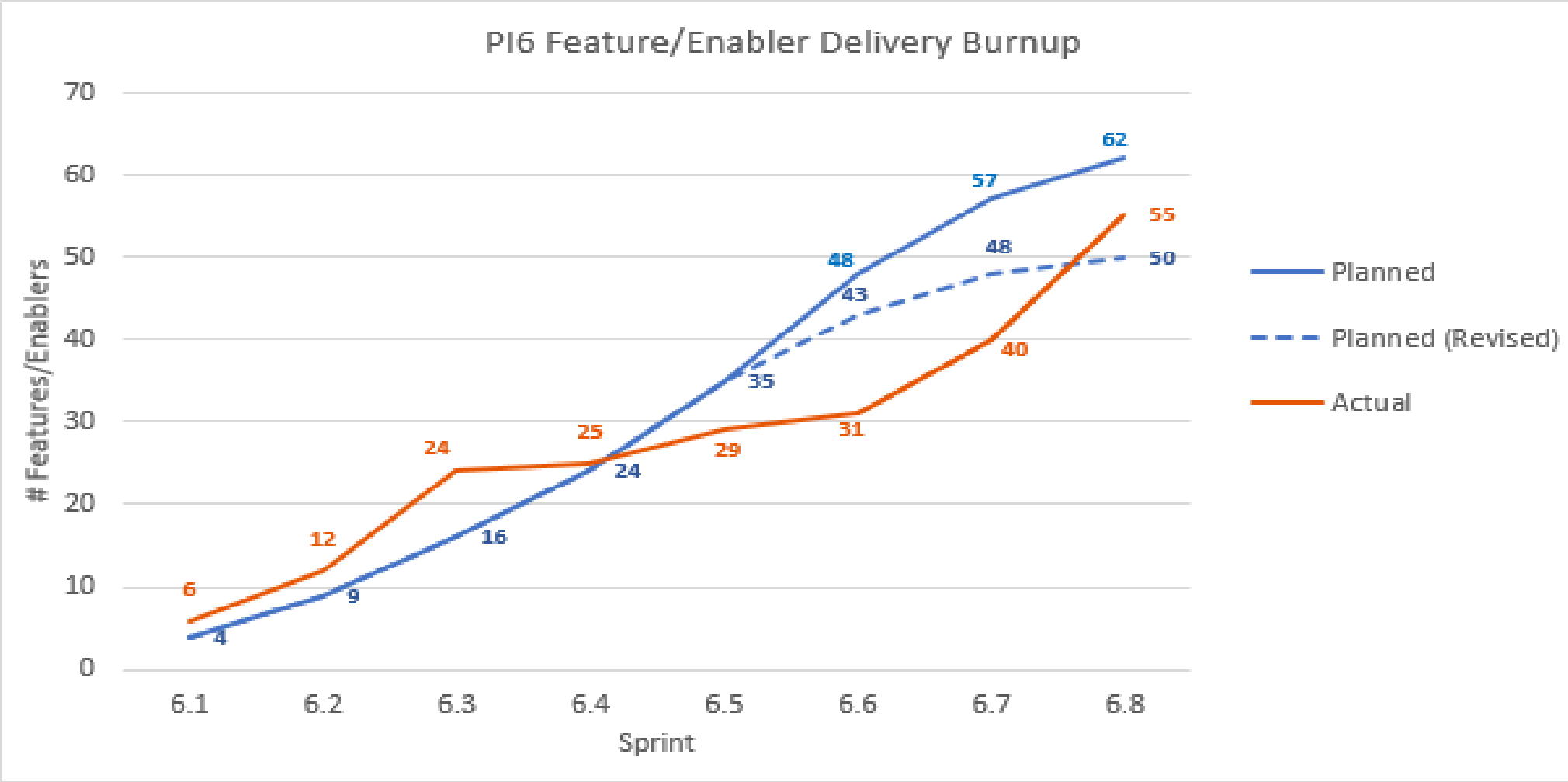
Benefits

Reduction in skip rates , better economic decisions, reduced workload in the control room

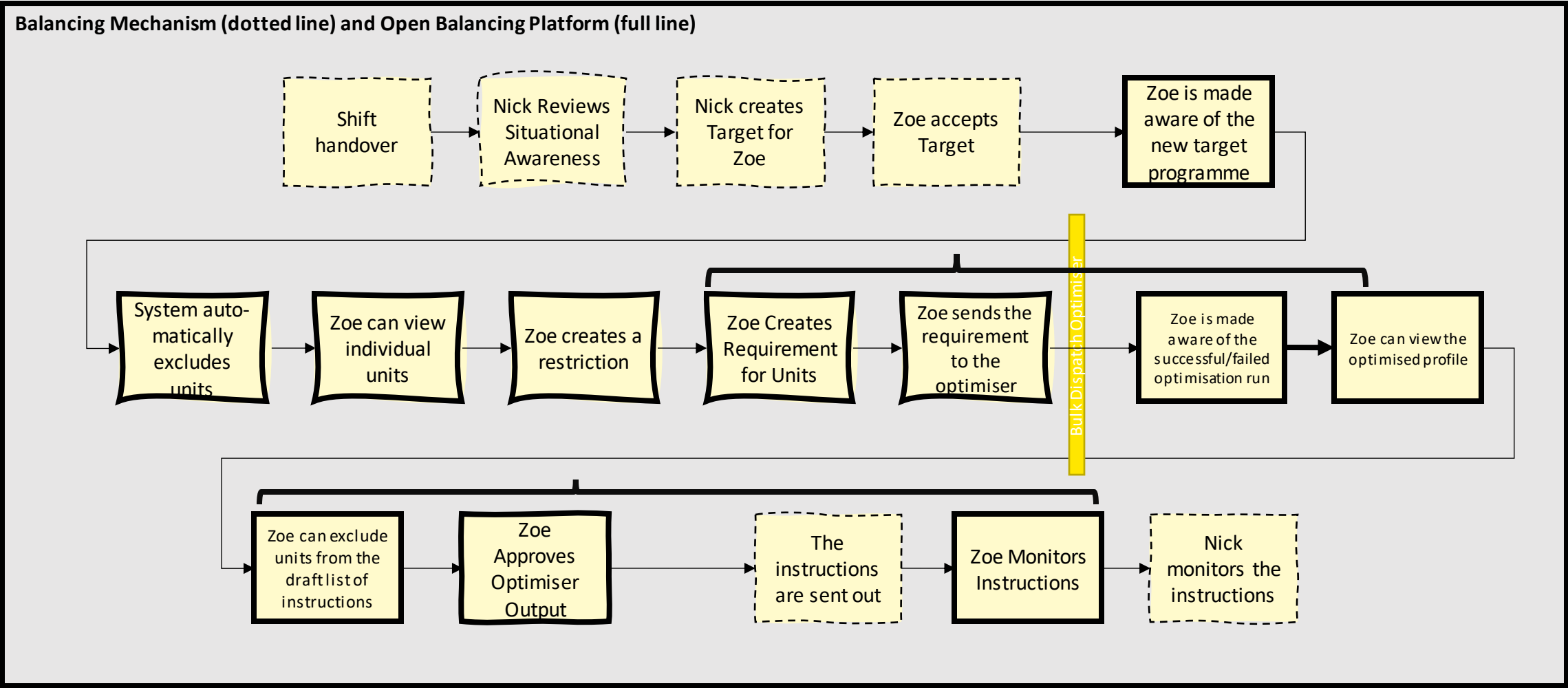
PI6 Complete, Started PI7



Story of PI6



Storyboard Schematic (Release 1.0)



Demo of Functionality To Date

Demo of developments to date

[BS Webinar 17/2/23 - PI6 Demo - Final - Business Engagement Session \(brightcove.net\)](#)

Social Media Feedback to Industry Engagement Day

[Open Energi \(Battery Storage\) LinkedIn Article:](#)

[Modo \(Battery Storage\) News Article & Video](#)

"New technology is on the way and we've seen it working"

Industry Co-created Roadmap - planned updates

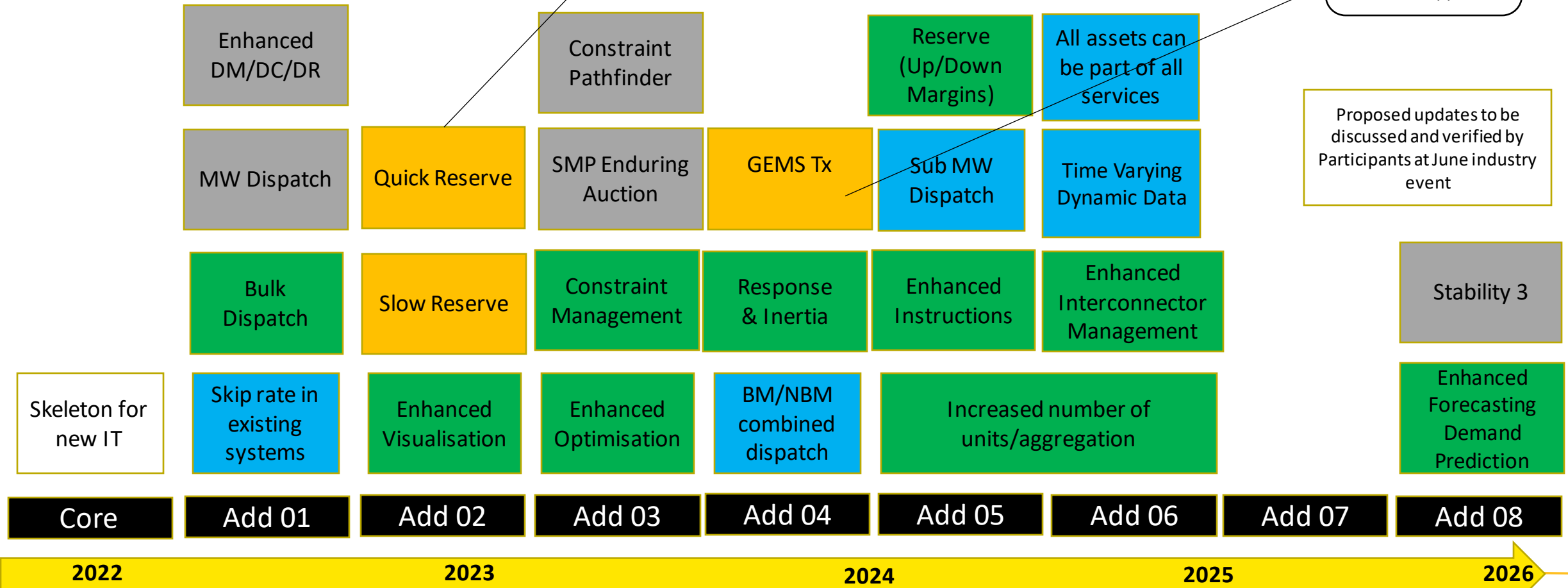
Key:

- Grey Box – Market Initiative, RDP or Pathfinder
- Green Box – Capabilities required by the control room
- Blue Box – Capabilities generated by Industry
- AMBER – proposed changes

NBM Optional Reserve has been split into Quick and Slow now that we have more detail

GEMS Tx has moved to 2024 because of issues with Scottish Power supplier

Proposed updates to be discussed and verified by Participants at June industry event





Break

11:00 – 11:20

Data Analytics Platform update

Item 8

Mark Limpkin

Topics to discuss...

Advanced Analytics Environments – what experience and lessons can TAC offer with respect to setting up scaled AA environments for Data Science exploration?

Advanced Analytics Publication – how do you govern the publishing of AA models to be shared to wider stakeholder groups – i.e. path to production?

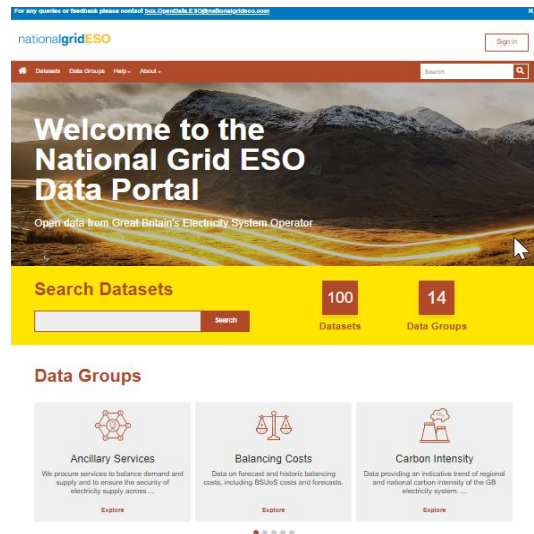
Demand Management – What factors do you consider when scoring opportunities/new demand?

Demand Management - How do you keep stakeholder groups informed with new features, i.e. datasets, reports, dashboards, analytic models, to limit unnecessary/duplicate demand requests?

Data Portal | DAP | DEP

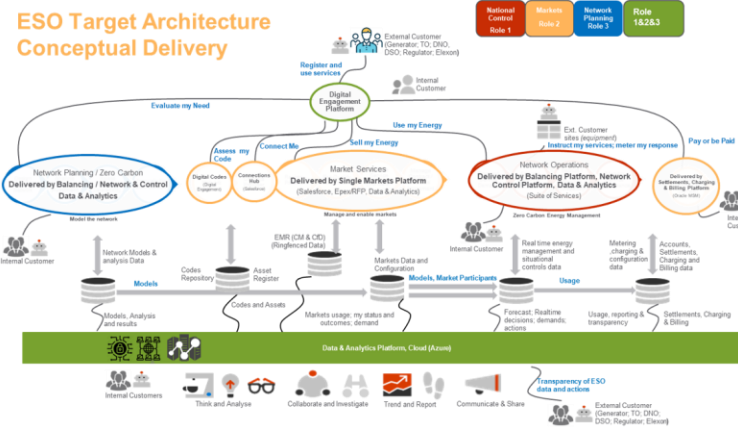
A fully data enabled system operator

1 ESO Data Portal



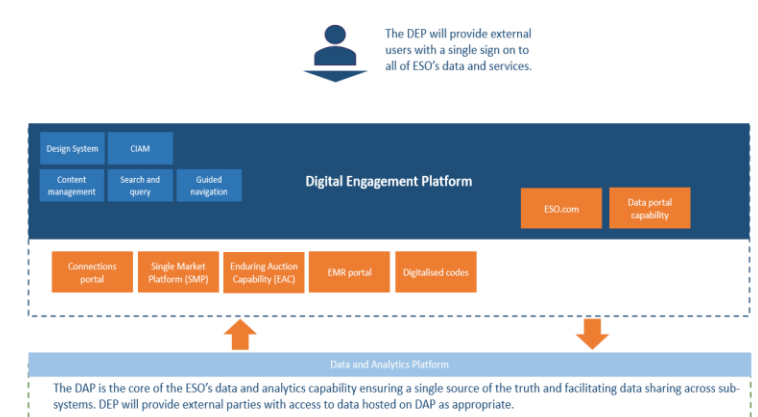
- Facilitate new and efficient markets through making data open and available to our stakeholders wherever possible.
- Building a centralised repository for all published ESO data.
- Offering intuitive and powerful ways to discover and search for our data.
- Powerful API generated automatically for all machine readable datasets

2 Data & Analytics Platform (DAP)



- **Data driven decisions:** Data at the heart of every decision, be it operational, strategic or tactical
- **A self-serve capability:** Our people enabled with the tools and skills to extract value from trusted data
- **Open Data:** Facilitating new and efficient markets, zero-carbon system operation, and driving innovation
- **Governance:** Consolidation of our data on to a single platform utilising a curated data catalogue

3 Digital Engagement Platform (DEP)



- A single point of access to ESO content, data and external facing processes. It will create a separate digital presence for the ESO.
- The experience of doing business with the ESO more intuitive and user friendly through providing a consistent and personalised user experience.
- By removing friction and enhancing engagement DEP will drive greater market participation and innovation.

DAP Journey so far...

From Strategy to Go-live...

Strategic Direction

Data & Analytics Strategy Outcomes

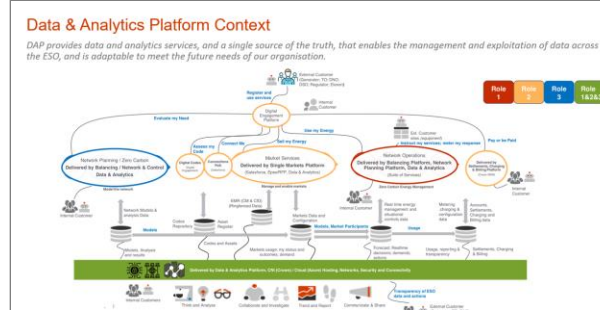
A fully data enabled system operator, driving the transition through Open Data

The outcomes our Data & Analytics Strategy will deliver

A data driven ESO:
Data at the heart of every decision, be it operational, strategic or tactical

A self-serve capability:
Our people enabled with the tools and skills to extract value from trusted data

Open Data:
Facilitating new and efficient markets, zero-carbon system operation, and driving innovation



Level of Readiness

Use Case	MVP Scope defined & agreed	Epic & Feature agreed	Core Capabilities defined	SME support confirmed	Dependencies defined and agreed	Conceptual Design Agreed	All related data sources documented	Acceptance Criteria agreed	Overall Status
Future Energy Scenario (FES)	Ready	Ready	Ready	Ready	In progress	Ready	Ready	In progress	Ready
Data Portal (DP)	Ready	Ready	Ready	Ready	In progress	Ready	Ready	In progress	Ready
Platform for Energy Forecasting (PEF)	Ready	In progress	Ready	Ready	In progress	Ready	Ready	In progress	In progress
Operability Intelligence (OI)	Ready	Ready	Ready	Ready	In progress	Ready	Ready	In progress	Ready
Inertia Monitoring (IM)	Ready	Ready	Ready	Ready	In progress	Ready	Ready	In progress	Ready
Apollo and Delphi (DC)	Completed	Completed	Completed	Ready	In progress	In progress	In progress	Completed	In progress

HIGHLIGHTS:

- Based on the readiness assessment, 4 out of 6 use cases are ready to move to the design stage of DAP MVP (Pov approach for OI)
- Final sign off remaining for AD based on the architecture submitted for validation
- Architecture view prepared for all use cases
- DCv3s dashboard updated and mapped for FES, DP and IM
- Acceptance criteria drafted for FES, DR, IM & OI and shared with teams for validation
- Dependencies & assumptions drafted and submitted for validation

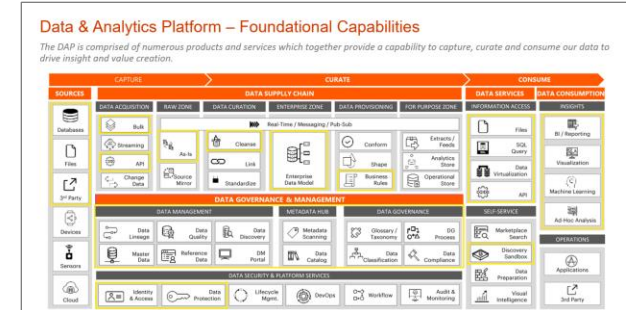
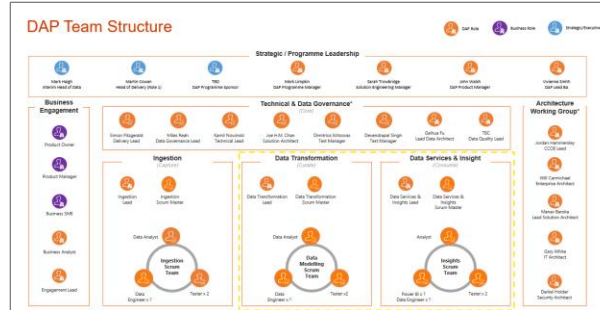
Mar – Jul 2022

Capability Build

Data & Analytics Operating Model

D&A activities will be orchestrated through a "Hub and Spoke" organisational construct, which seeks to balance Centralisation v's Decentralisation.

- Data Governance:** An ESO Data Governance body implements data quality standards and data privacy policies, controls data access management, and has central visibility of data ownership.
- Self-serve Data & Analytics:** The "data as a product" approach is underpinned by our self-serve D&A platform (DAP), which abstracts the underlying technical complexity to enable users to focus on their individual data use cases within their business domains.
- TechOps for Data Products:** The application of TechOps to the development and operation of data products delivering timely, trusted, analytics ready data to the point of use.
- Design Consultancy:** In the early stages of adoption of the platform, a Design Consultancy capability within the Hub will work with business teams to advise and guide the development and embedding of data products.

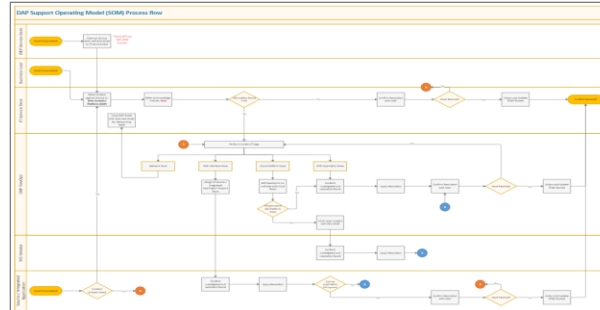


Aug – Dec 2022

Service Transition

Service Acceptance Criteria

Criteria	Acceptance Criteria	Notes
1.1
1.2
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1.7
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1.50



Inertia Monitoring Use Case

Systems through which near real-time and forecasted inertia is made available for business decisions. Currently, the RTL (Reactive Technologies Ltd) tool provides near real-time inertia and the GE Digital (General Electric Digital) tool provides near real-time and forecast inertia.

Dependencies:

- Access to Source Systems (GE & RTL)
- Modified APIs (1st party) to acquire data from the tool

Assumptions:

- No restriction to access the data in either the GE or RTL tool
- Commercial arrangement in place to support modification of existing APIs or create new

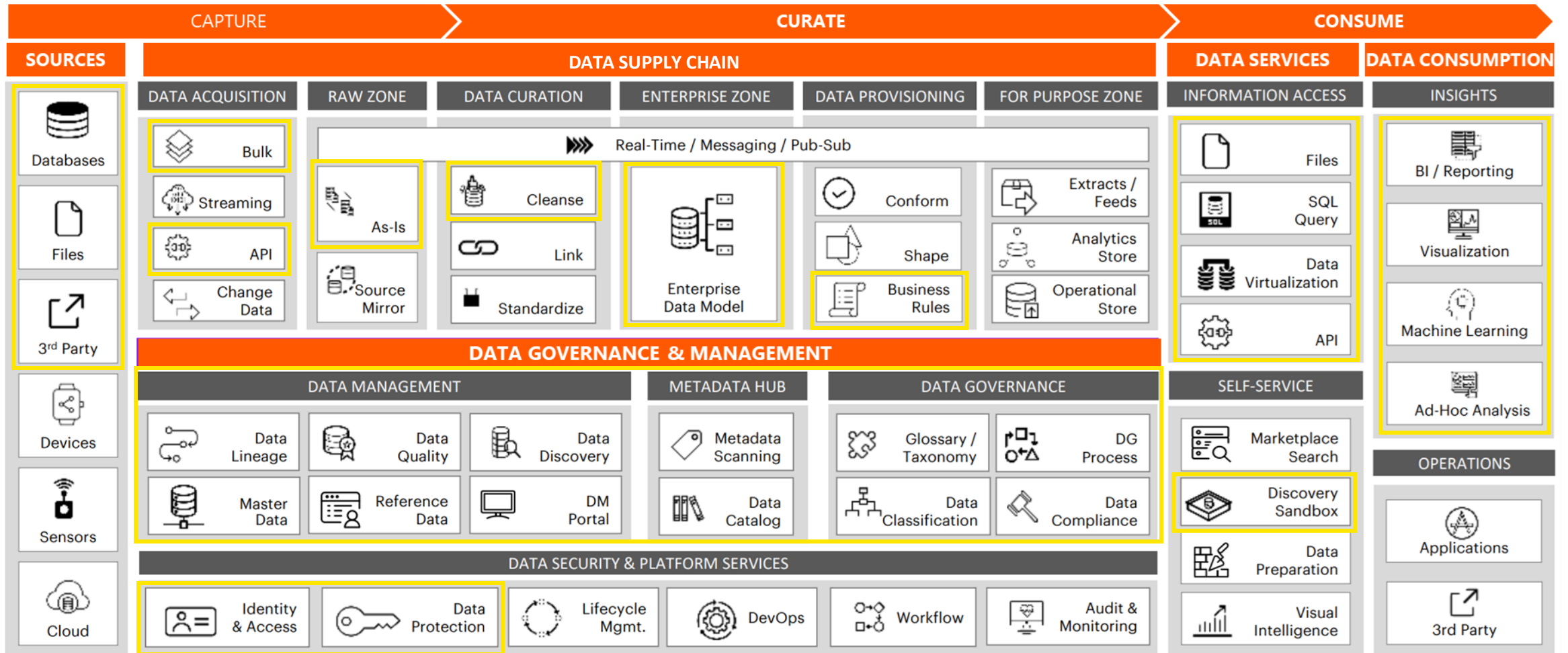
Out of Scope:

- No data science requirement at this stage

Oct – Dec 2022

Data & Analytics Foundational Capabilities

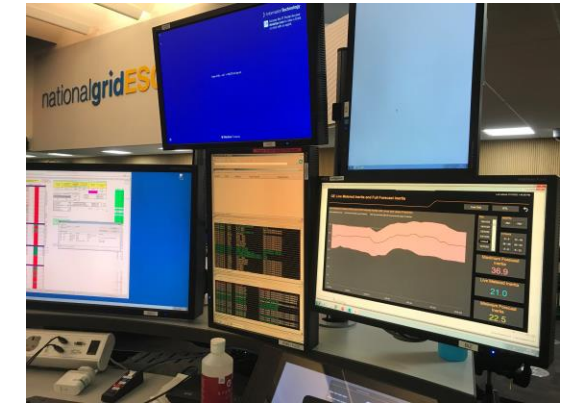
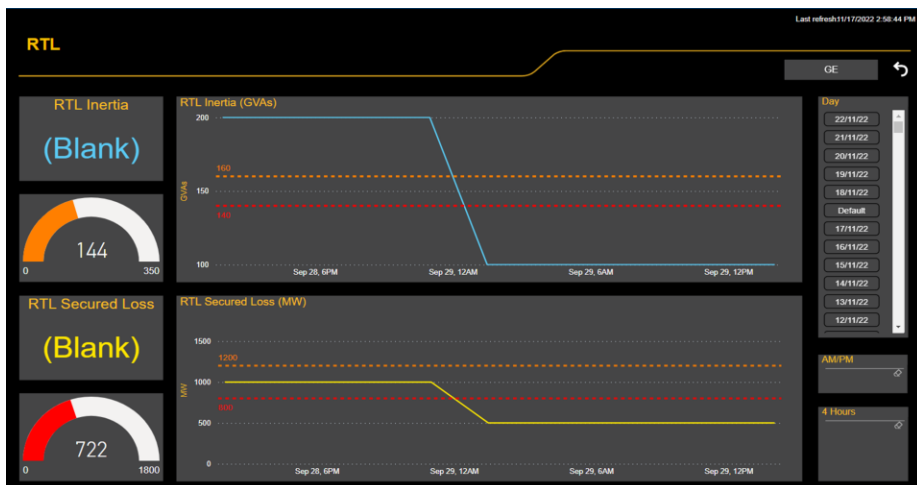
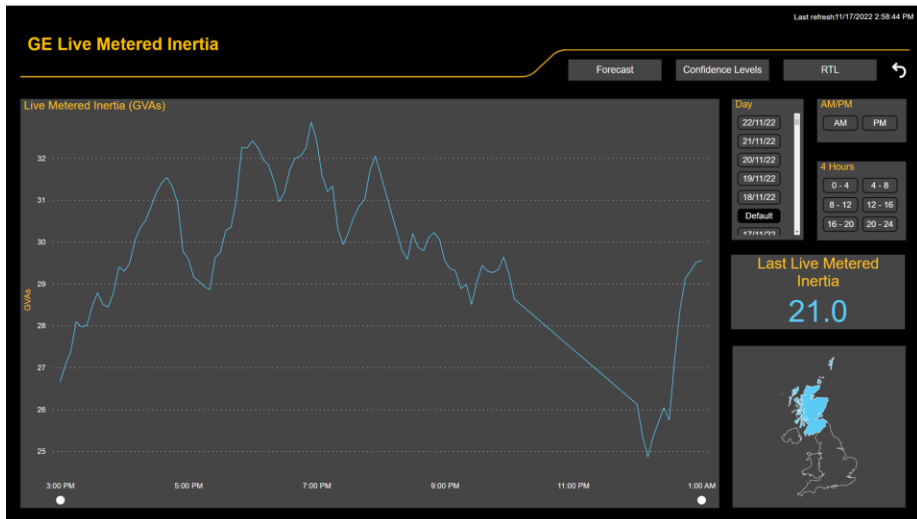
The DAP is comprised of numerous products and services which together provide a capability to capture, curate and consume our data to drive insight and value creation.



Components for the day-1 foundational capability

Inertia Monitoring

The RTL (Reactive Technologies Ltd) tool provides two data (Inertia and secured loss) values that represent the whole of GB. The GE Digital (General Electric Digital) tool provides several data points representing both real-time and forecast Inertia - solely for Scotland at present. In due course, the GE system will expand coverage to include the whole of GB, comprising of four defined regions



Please Note:

All data populating the prototype GUIs is for demonstration only and should not be interpreted as a real live representation of system conditions

DAP Current Priorities

Building upon Foundational Capabilities and Lessons Learned



1

Use Case Delivery

- Inertia Monitoring
- Digital Engagement Platform
- Single Markets Platform
- Platform for Energy Forecasting
- Future Energy Scenarios
- Network Modelling
- End User Developed Applications



2

Advanced Analytics

- Advanced Analytics Environment
- Basic AAE Exploratory
- Scaled AAE
- Pathway to Production



3

Capability | Discovery

- Data Catalogue**
- Mobilisation of Purview Team
- Purview Demo's
- Upskill Data Governance Team
- Legacy Application Discovery**
- Engage technical / application stakeholders
- DAP Architectural Alignment



4

Stakeholder Engagement

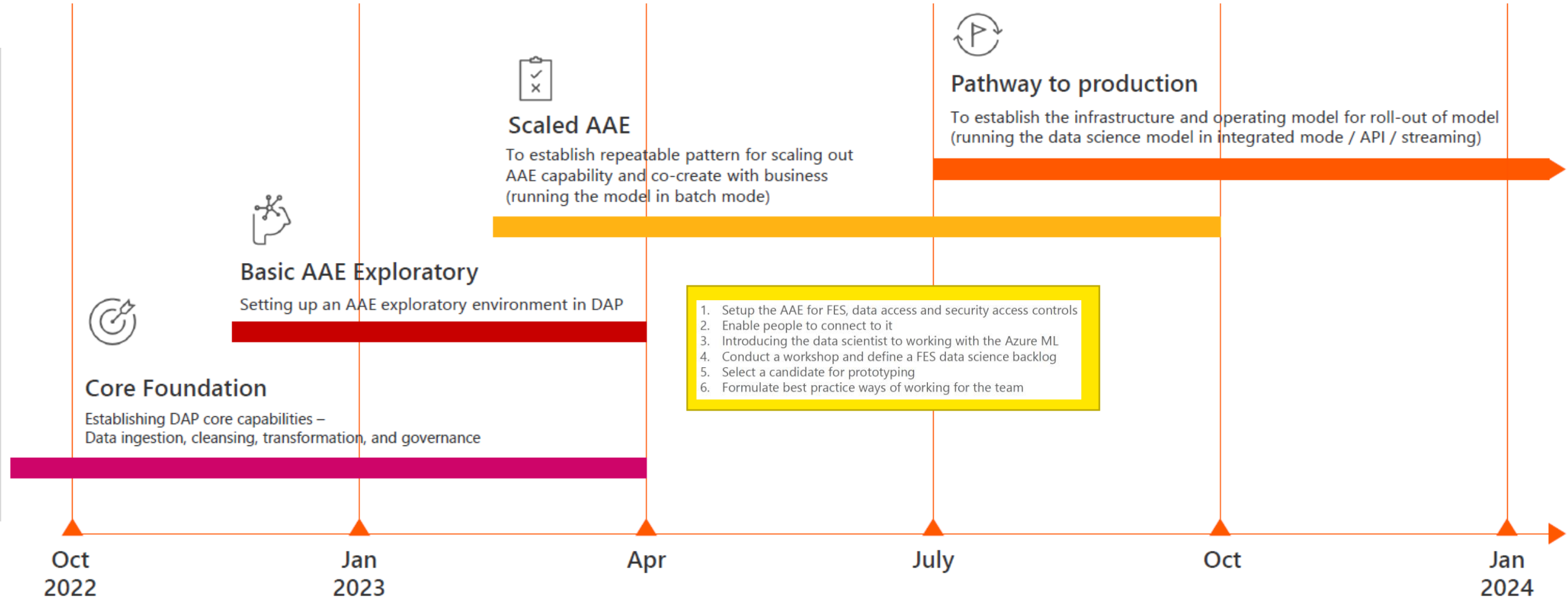
- Stakeholder Engagement Framework roll out
- Initiative capture and prioritisation
- Stakeholder groups and personas
- DAP Roadshows

DAP AAE Roadmap

Establishing a scaled Advanced Analytics Environment


TALKING POINTS

- What experience and lessons can TAC offer with respect to setting up scaled AA environments for Data Science exploration?
- How do you govern the publishing of AA models to be shared to wider stakeholder groups – i.e. path to production?



DAP Engagement Framework

Enabling smooth transition from Initiative to Delivery



DAP request form

Please use this form to contact the Data Analytics Platform (DAP) team to request engagement for a new opportunity. Once the DAP team have received this form, then a member of the team will be in contact to discuss your opportunity further. Please complete the following high level questions:

Hi, Mark. When you submit this form, the owner will see your name and email address.

* Required

1. Please provide a brief high level description of your requirement *

Enter your answer

2. Is this requirement dependent on meeting an ESO Business Plan deliverable (Ofgem milestone)? *

Yes
 No
 Maybe

3. What is the due date for this requirement? *

Please input date (dd/MM/yyyy)

4. Please provide the details of the main contact who we can speak with to discuss this requirement *

Enter your answer

5. Is there anything else DAP needs to know about your requirement at this stage? *

Enter your answer

Send me an email receipt of my responses

Submit

- ### TALKING POINTS
- What factors do you consider when scoring opportunities/new demand?
 - How do you keep stakeholder groups informed with new features, i.e. datasets, reports, dashboards, analytic models, to limit unnecessary/duplicate demand requests?



Data & Analytics Platform Roadmap

Dec '22 - DAP Go-Live

Data Platform - Minimum Viable Product

Inertia Monitoring (IM) Use Case

Data Governance Forum & Processes

Machine Learning (ML) capability



Apr '23

Digital Engagement Platform (DEP) integration (Phase 1)

Single Markets Platform integration (1)

Complete MVP use-cases

ESO Data Catalogue



2023/24

IM – Go-Live (ENCC)

Onboard End-User Developed Applications

Self-Serve Data Analytics

DEP Integration (Phase 2)

Data Portal (DP) data migration

Network Modelling improvements

NOA Enhancements

ML Use-cases



2024/25

Open Balancing Platform (OBP) Integration

Onboard EUDA applications (2)

Economic Database (NED) & Market Reporting (MODIS) retirement

DP retirement



2025/26

Network Control Management System (NCMS) Integration

Operator Console Integration

Data Historian (DH) replacement



2026+

Analytics and data publishing through DAP platform



Note: The Roadmap does not represent an exhaustive list, but presents samples of the DAP deliverables and ESO project engagements



Subgroups update

Item 9

Subgroups update

- No meetings since last TAC



Next meeting and discussion about the future

Item 10

Vernon Everitt

Arrangements for after March 2023

- Thank you so much for your commitment to the TAC so far
- We recognise that this is the end of the original commitment.
- We will consult with you about whether you would like to remain on the TAC in the next couple of weeks.
- As part of this we will draft an updated terms of reference as it hasn't been refreshed in some time.
- We would also like to consider your feedback about how we can improve the TAC in the future.

Next meeting and calendar

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

- 2 June 2023



AOB

Item 11

Vernon Everitt