ESO Technology Advisory Council

TAC-9

2 December 2022

Meeting pack

ESO

TAC-9 agenda – 2 December 2022

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	Feedback from last meeting
4	09:15	11:00	105	**Data governance** **Data landscape** **Data & Analytics Platform** **Digital Engagement Platform** **Discussion**	Nikhil Madani Mark Limpkin Joseph Donohoe	Refresher – BP2 Architecture & Data Vision Update on work programmes Initial thinking on platforms and architecture Benefits and value Lessons learnt and considerations from TAC
	11:00	11:15	15	**BREAK**		
5	11:15	11:30	15	**Open Balancing Platform**	Rob Rome	
6	11:30	12:00	30	**RIIO-2 BP2 Draft determinations**	Dan Delgado Gareth Davies	
7	12:00	12:05	5	**Subgroups update**	Vernon Everitt	
8	12:05	12:25	20	**Next meeting and discussion about arrangements for after March 2023**	Vernon Everitt	Next meeting: Friday 3 March 2023
9	12:25	12:30	5	**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-8 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:

- Balancing Programme – vision and Open Balancing Platform
- Network Control Programme – the control room of the future

Feedback from the TAC:

Balancing Programme

- Merit order dispatch
- Market reform (eg LMP and REMA)
- Cost of living and winter
- Customers
- Demand side response
- Supply chain issues
- Containerisation
- Proposed architecture

Network Control programme

- Human-machine interface and decision support
- External case studies (eg aircraft, airport, trading houses, telecoms, transport operators)
- Alarms and alarm management
- Standardisation v personalisation

Data

Item 4

Mark Limpkin

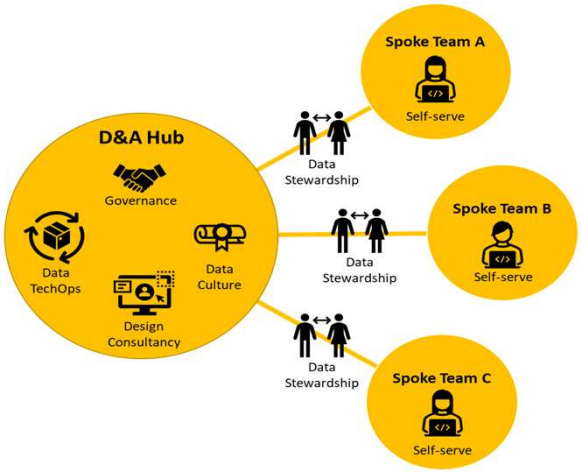
Data Governance

Nikhil Madani

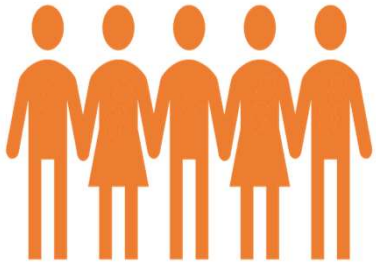
Question Topic

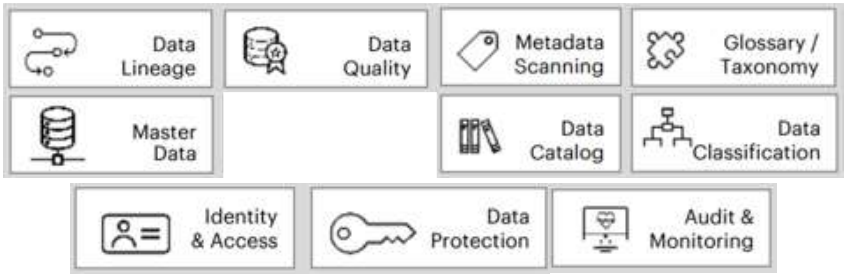
- Are any other similar hub and spoke operating models in use? If not which operating models have you found success with?
- How have you setup your data governance forums?
- What Data Quality tooling have you currently deployed, and would you procure the same tools again if you started from new?

Data Governance



ESO Data Governance Council





Listening to requirements / needs and adapting with our WoW

Hub and Spoke model to reduce distance to decision making and data production

Forums established to break down silo's

Utilising Technology to drive governance

Allowing maximum value to be realised

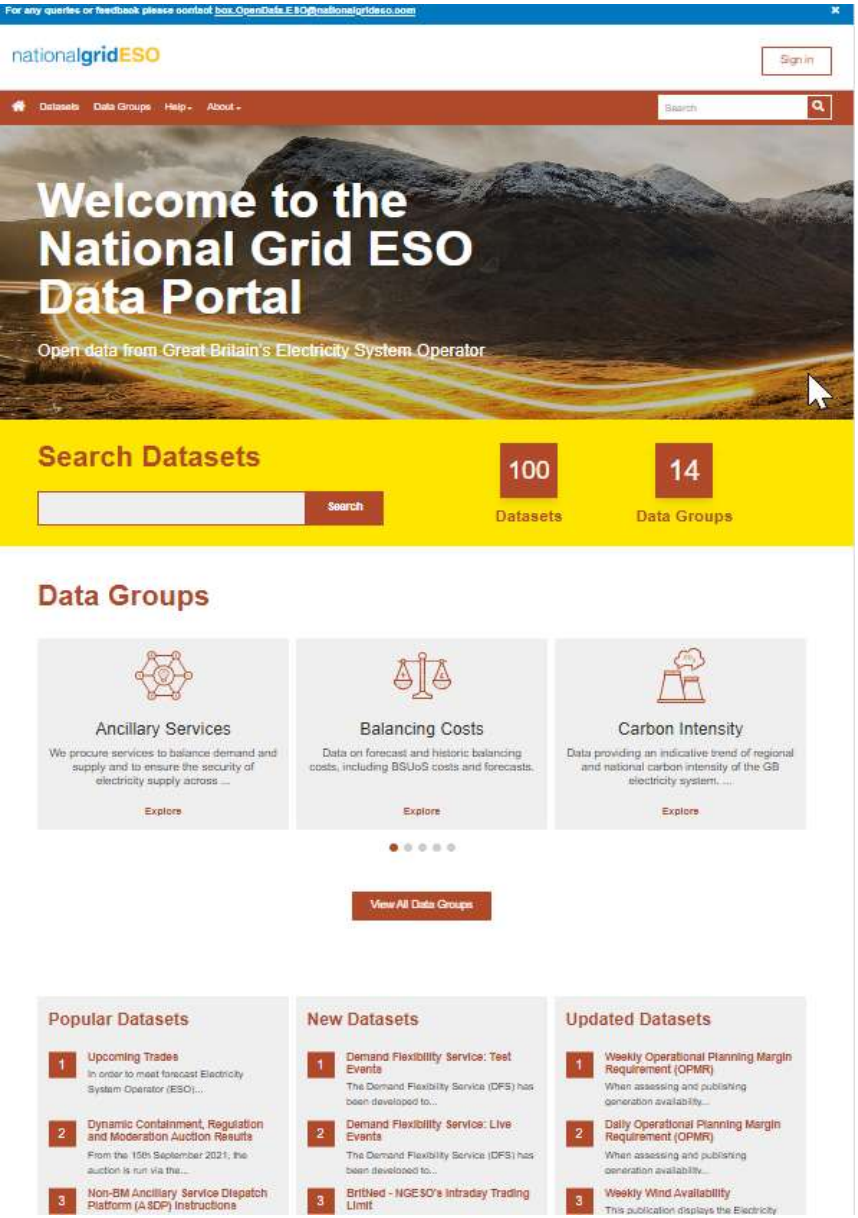
Current Data landscape: Open Data

Nikhil Madani

Question Topic

How are you utilising our Data portal?

From your experience what other benefits would you like to see?



Requirement for Open Data

BP1 forward plan:

- **Ambition to facilitate new and efficient markets through making data open and available to our stakeholders wherever possible.**

Requirement:

A clear interface for ESO data for industry currently using CKAN

- **Utilise Industry standard application programming interfaces (APIs) for ease of access**
- **Implement Dublin Core industry standard metadata**

BP2: Enduring solution:

- **Outside in approach**
- **DAP to provide single source of truth for ESO data**
- **Users to request / search for relevant data sets through DEP**

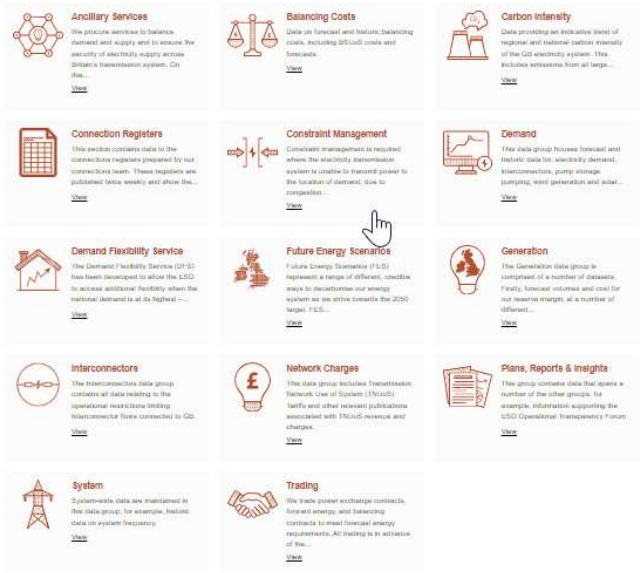
WoW:

- **Agile delivery model**

Benefits of Open Data

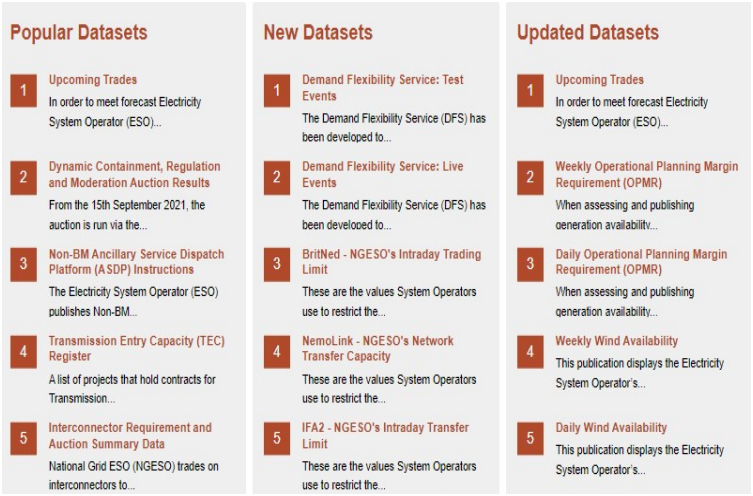
Discovering & Searching

- Building a centralised repository for all published ESO data.
- Offering intuitive and powerful ways to discover and search for our data.



Data Groups

Keywords/Tags

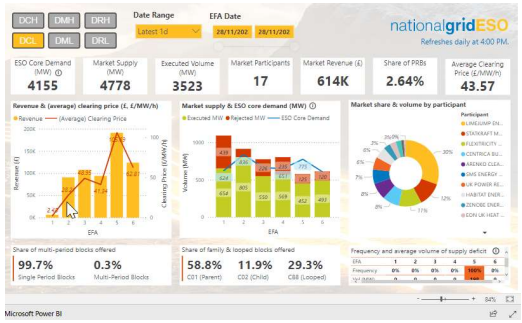


Data feeds

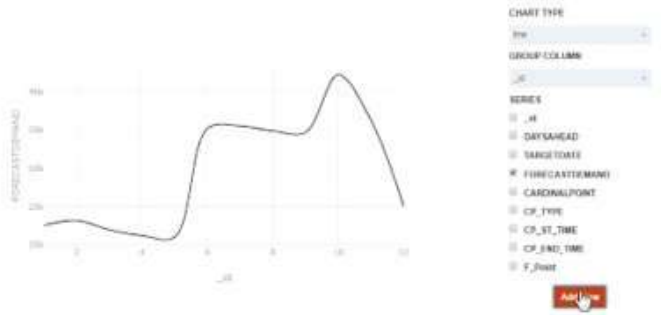
Benefits of Open Data Continued…

Consuming & Reusing

- Powerful API generated automatically for all machine readable datasets
- Implemented powerful Power BI visualisation which users can interact with
- Functionality to visualize, create rules and manipulate data within the browser
- Publishing data under an open license
- E-mail and SMS notifications



User controlled Power BI visualisation



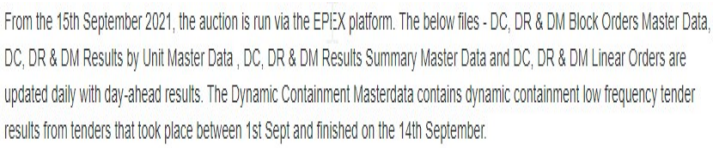
User controlled manipulation of data

API with SQL capability

Benefits of Open Data Continued…

Understanding

- Detailed descriptions for all datasets, removing jargon and explaining acronyms
- Implementing industry standard metadata i.e. Dublin Core in line with Energy Data Task Force (EDTF) and OFGEM's data/digital best practice guidelines
- Query builder allows users to create a query automatically which they can use to deploy in their programs



Detailed dataset descriptions

Industry standard metadata i.e. Dublin Core, in line with Energy Data Task Force (EDTF)

Query builder available in 5 popular programming languages

Data and Analytics Platform

Mark Limpkin and John Walsh

Question Topic

How have other utilities (or similar) gone about building a Data and Analytics capability (iterative/big-bang)?

Given the skills challenges in the data sector, how have you managed to get the right resource mix between strategic partners and internal capability and capacity?

Given the scale and duration of the backlog, what advice would you give in developing a roadmap and building a platform capability?

Data & Analytics Platform

A fully data enabled system operator

The Data & Analytics Platform will enable

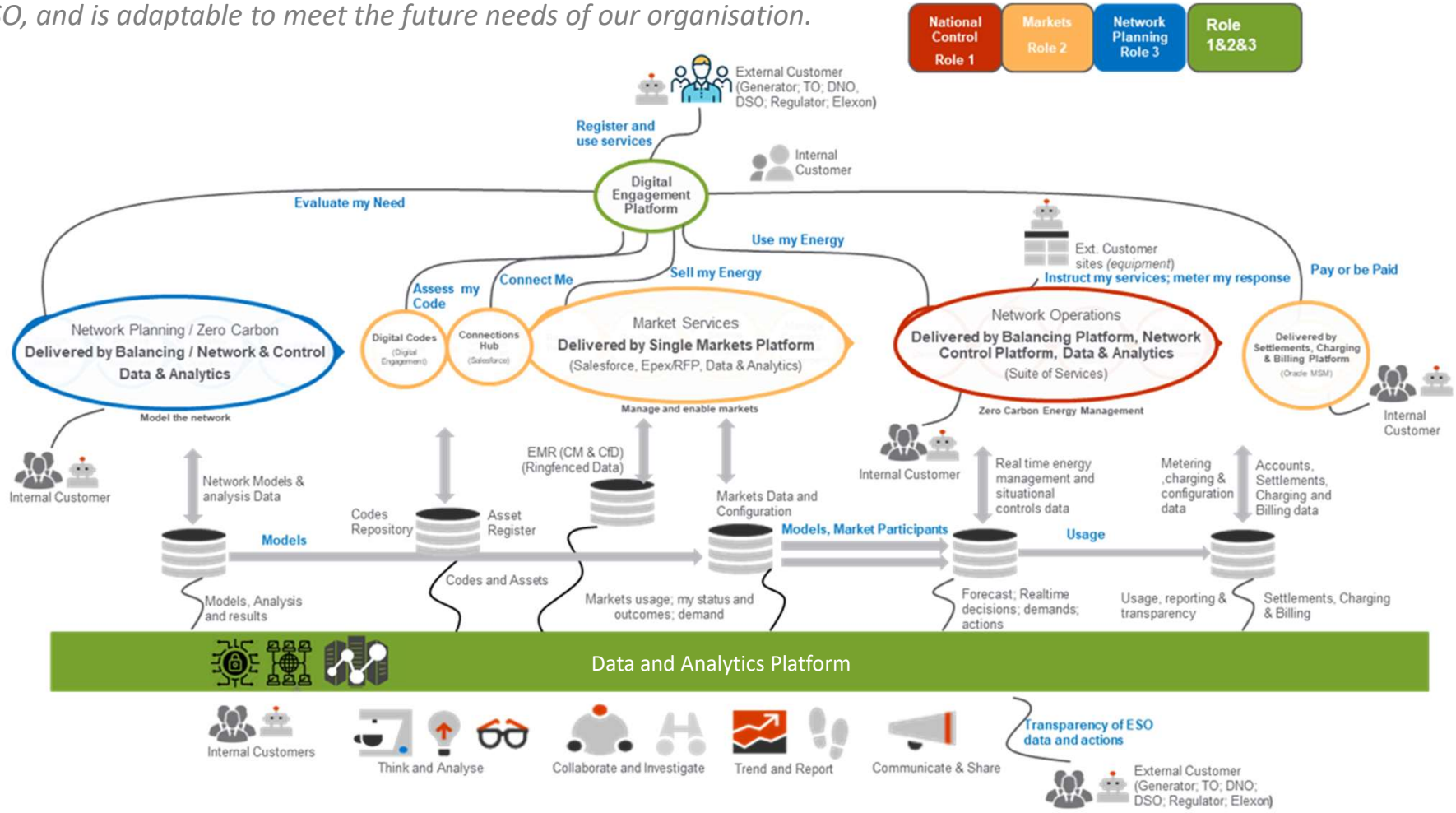
Data driven decisions:
Data at the heart of every decision, be it operational, strategic or tactical

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

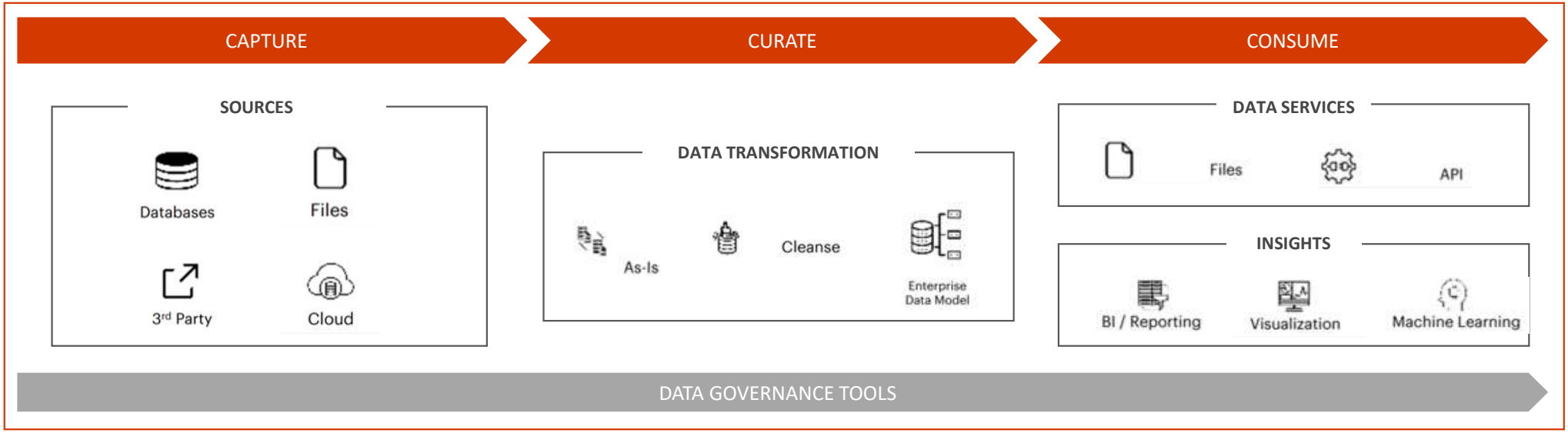
Data & Analytics Platform Context

DAP provides data and analytics services, and a single source of the truth, that enables the management and exploitation of data across the ESO, and is adaptable to meet the future needs of our organisation.



Data & Analytics Platform – 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.



The capture of data is enabled through various tools and processes, data can be ingested from various sources on a batch, real-time of ad-hoc basis.

Data is landed on the platform in raw format in readiness for cleansing and standardisation.

The curation of data is progressed through a cleansed and standardisation process delivering trusted, analytics ready data for consumption through a choice of access channels.

Data is mapped to our enterprise data model, and transformed for use depending on the intended purpose.

The Data Consumption layer provides users with the tools to report, visualise, and analyse data, and supports more advanced use cases such as model development and machine learning.

Users can utilise self-serve tools for experimentation outside of the standardised Capture and Curate steps.

Data & Analytics Platform - Initial Use Cases

Use Cases have been selected for the initial build/configure work based on readiness and business value, to create a baseline capability to capture, curate and consume data as a starting point for platform expansion

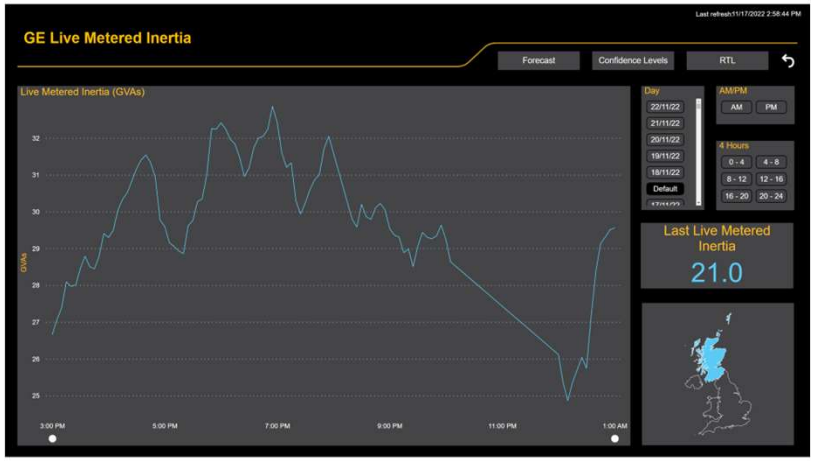
Use Cases

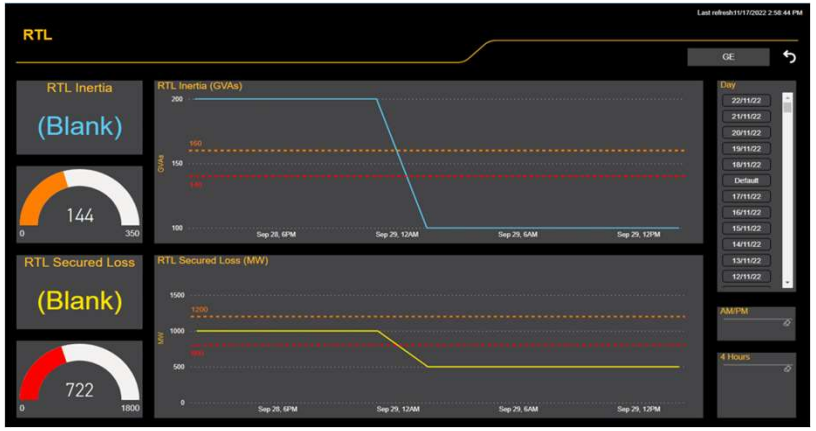
- Inertia Monitoring
- Data Portal (for DEP Integration)
- Future Energy Scenarios
- Platform for Energy Forecasting
- Network Modelling
- Apollo & Delphi

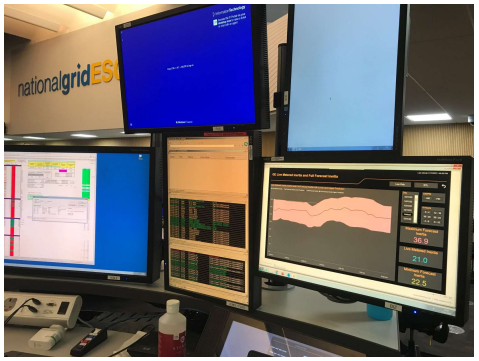
CAPTURE	CURATE	CONSUME
Data sources: • Elexon • GE • RTL • Sheffield Solar • Met Office weather • EFS • FES inputs	Data storage, transformations, modelling & management Master Data Management (MDM) Data governance workflows & data quality checks	Data served via API's Visualisation & dashboarding Reference data interface Machine Learning (M/L) Data publication patterns

Inertia Monitoring – Prototype GUIs

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

Data & Analytics Platform Roadmap

Dec ’22 - DAP MVP

Data Platform minimum viable product

Inertia Monitoring Use Case

Data Governance Forum & Processes

Data TechOps capability

Mar ’23– Integration

Digital Engagement Platform (DEP) integration (Phase 1)

Single Markets Platform integration (1)

Key user stories delivered

Open Data Catalogue

Sep ’23 – EUDA

Onboard End-User Developed Applications

Self-Serve Data Analytics

DEP Integration (Phase 2)

Data Portal (data) migration

Mar ’24 – OBP

Open Balancing Platform Integration

Onboard EUDA applications (2)

Economic Database & Market Reporting retirement

Mar ’25 – NCMS & CNI

Network Control Management System (NCMS) Integration

Operator Console Integration

Mar ’26 – Enduring

All analytics and data publishing through DAP platform

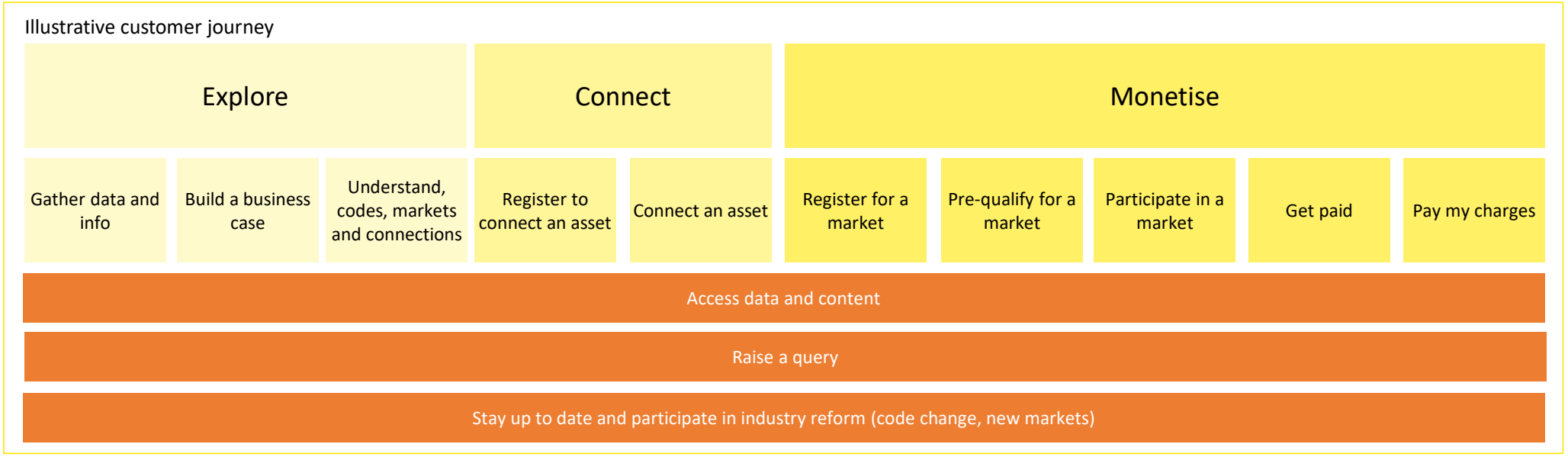
Digital Engagement Platform

Joseph Donohoe

Question Topic

For further evolution of our open data capability as part of the broader customer experience; should we prioritise visualisation and insight or direct access?

We're working to improve the customer experience for ESO customer s and stakeholders...



- Difficult to find information on the website, data available via an embedded data portal
- Difficult to stay up to date with high volume of email communications, newsletters and events
- Siloed processes and customer journeys - online operational processes through multiple systems and log-ins
- Unclear process – can be difficult to know what to do next
- Difficult to raise a query - multiple .box email accounts and fragmented interactions

To an experience that meets customer needs

Digital engagement customer needs:

- I want a **consistent user experience** in all my interactions with ESO
- I want **a single login** to all my interactions with ESO, and want to only login once in my ESO journey
- I want to find and **access ESO content, data and advice** in a variety of forms
- I want to **engage and interact** with ESO, not just consume static information
- I want to move from passive consumption of information, to an **active/guided experience** which enables me to get my tasks done efficiently
- I want to consume and interact with ESO services in a **variety of channels**, including APIs

Making it easier to do business with the ESO

As the ESO takes on an ever greater role at the heart of the transition to a net zero energy system it is more important than ever that we make it easy to engage and interact with us.

The Digital Engagement Platform (DEP) will provide a single point of access to ESO content, data and external facing processes. It will create a separate digital presence for the ESO.

It will make 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.

ESO Digital Engagement Eco-system

The DEP will provide external users with a single sign on to all of ESO's data and services.

Design System

CIAM

Content management

Search and query

Guided navigation

Digital Engagement Platform

ESO.com

Data portal capability

Connections portal

Single Market Platform (SMP)

Enduring Auction Capability (EAC)

EMR portal

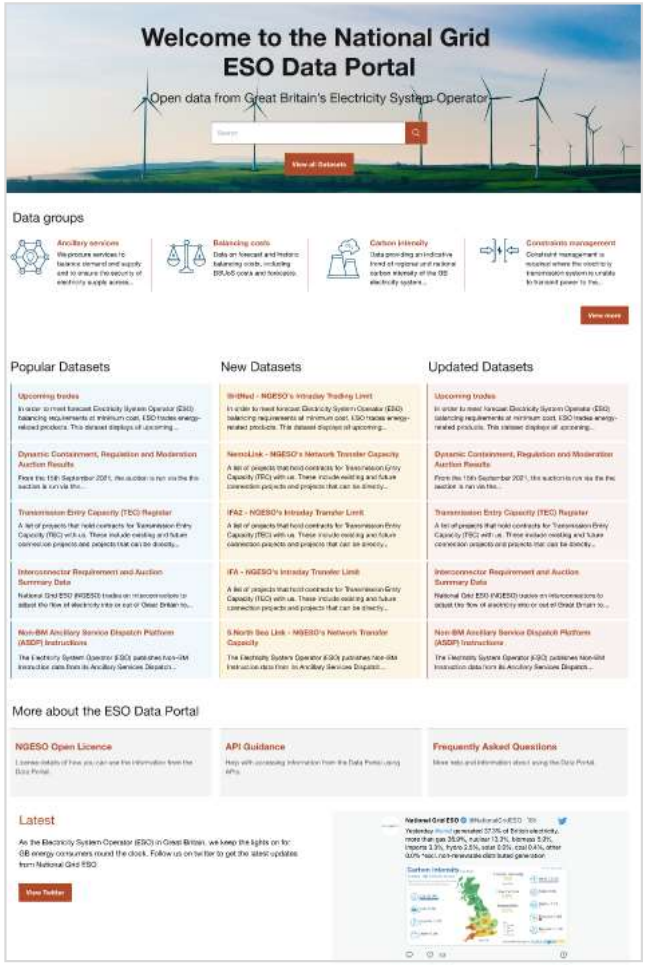
Digitalised codes

Data and Analytics Platform

The DAP is the core of the ESO's data and analytics capability ensuring a single source of the truth and facilitating data sharing across sub-systems. DEP will provide external parties with access to data hosted on DAP as appropriate.

ESO Digital Engagement Platform delivery update

- Release 1 in March 2023
  - Replatformed ESO website with updated IA, page designs and search
  - Integration of data portal capability
  - Supported by single sign on
- Backlog for FY24 includes
  - Integrated query management
  - Newsletter subscriptions and news digest
  - Application of single sign on to further use cases (Single Market Platform and Enduring Auction Capability)
  - **Investigating further evolution of our open data capability**



For further evolution of our open data capability; should we prioritise visualisation and insight or access?

Discussion

Architecture

1. How have other industries and organisation built and implemented their “Roadmaps to success” for :
    - Transforming the business from “Inside” to “Outside-In” – Culture, Open Data by Design, Sustaining value of delivery

2. How have others measured their success / improvement / act on feedback opportunities ?
    - Would it be beneficial to launch a TAC sub-group to deep-dive this topic ?

Governance

1. Are any other similar hub and spoke operating models in use? If not which operating models have you found success with?

2. How have you setup your data governance forums?

3. What **Data Quality** tooling have you currently deployed, and would you procure the same tools again if you started from new?

Open Data

1. How are you utilising our Data portal?

2. From your experience what other benefits would you like to see?

DAP

1. How have other utilities (or similar) gone about building a Data and Analytics capability (iterative/big-bang)?

2. Given the skills challenges in the data sector, how have you managed to get the right resource mix between strategic partners and internal capability and capacity?

3. Given the scale and duration of the backlog, what advice would you give in developing a roadmap and building a platform capability?

DEP

1. For further evolution of our open data capability; should we prioritise visualisation and insight or access?

Break

11:00 – 11:15

Open Balancing Platform

Item 5 - Rob Rome and Bernie Dolan

Question Topic

We would like to share with Market Participants technical details of how our new tools will work and how we are interpreting certain market rules

For example, details of how our optimisation routines will derive advice for the control room and our view of how parameters work for bi-directional units

What do you recommend as the best way to publish this and get feedback from external parties? How do we establish a permanent "data hub"?

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 PI5 (in October) and are now into PI6
- In PI9 we will make our first production release (Sept 2023 with a contingency date of Dec 2023)

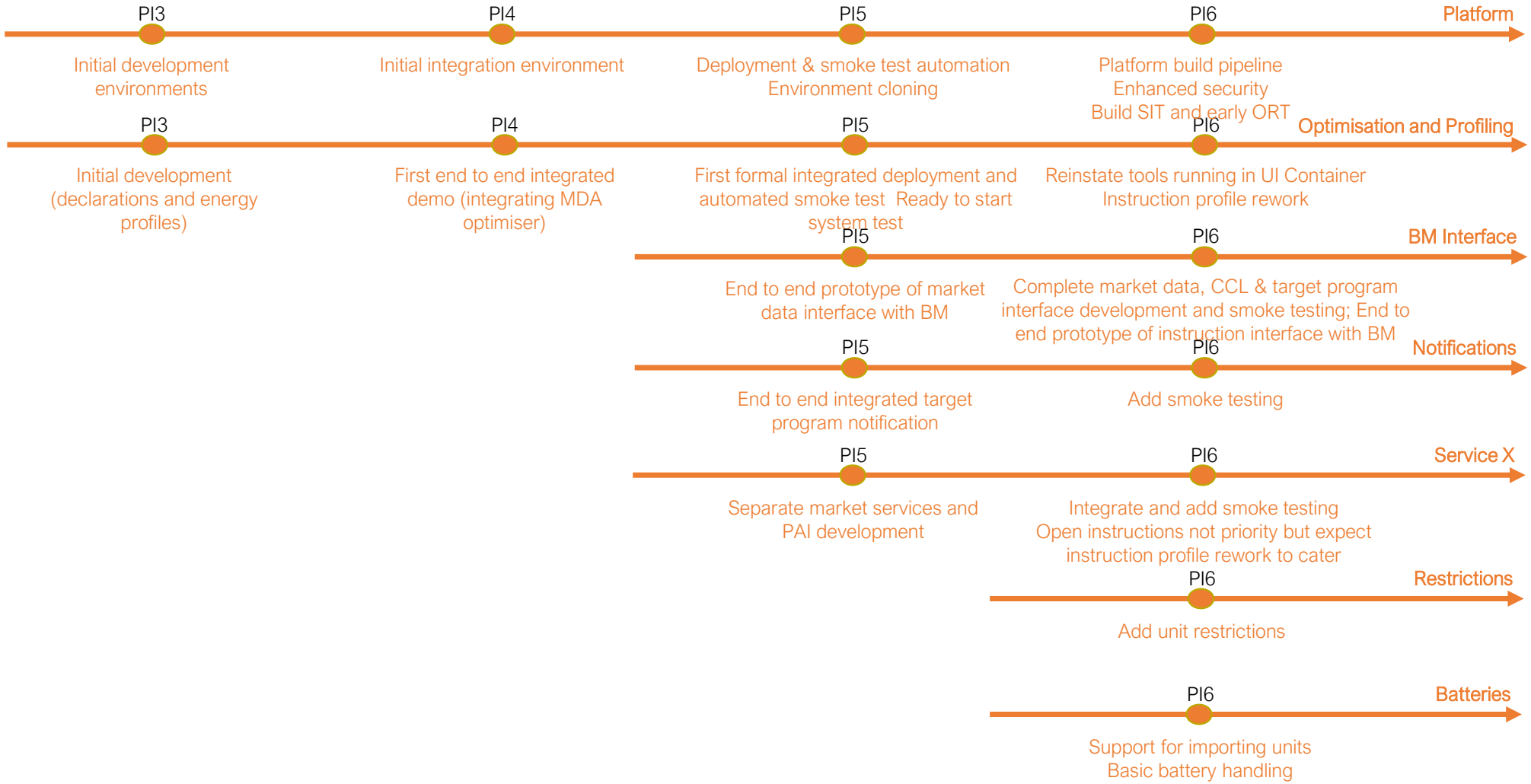
GOAL

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

Benefits

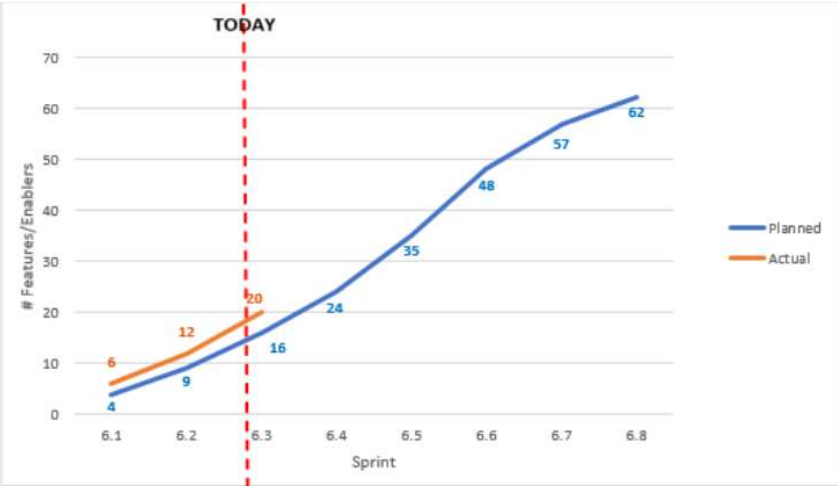
Reduction in skip rates , better economic decisions, reduced workload in the control room

Progress at the end of PI5 and targets for PI6



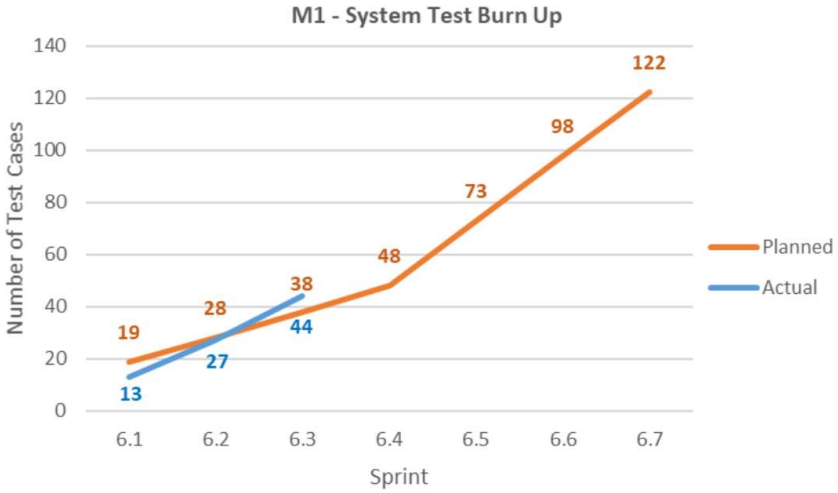
Balancing Transformation - PI 6 KPIs

Build



- Delivering ahead of plan into system test
- We have continued to introduce improvements PI on PI and as a result, we are delivering high quality code into test frequently.

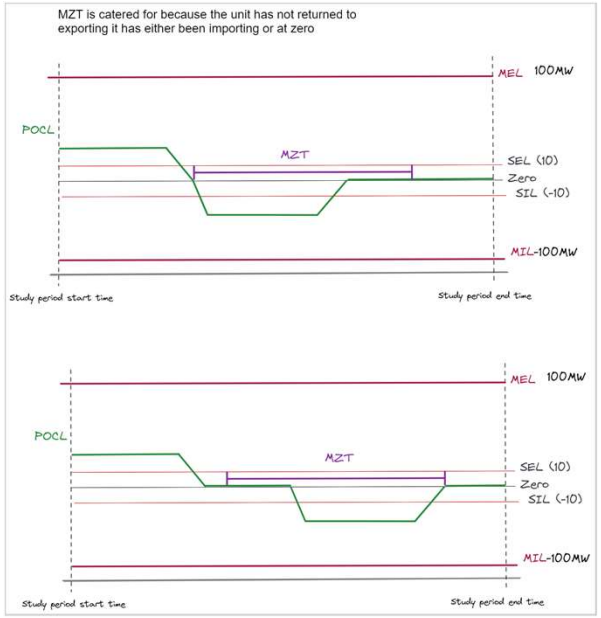
System Test



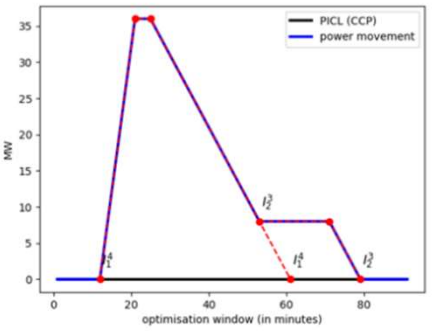
- Successfully executed 6 tests ahead of plan at this point in the PI
- All tests are automated, meaning we have a repeatable automation pack that can be executed without manual intervention – continuously ensuring quality of delivery.

Questions for TAC

- We now have a lot of detailed technical knowledge that we want to share
- Details of how the algorithms will work so that all participants can understand the implemented logic
- Information on how we have interpreted market rules for bidirectional units
- And much more as we get deeper into development
- Can the TAC share best practice on how they have done this in the past?
- What is the best way to keep parties informed of new information that is of interest to them
- How do we establish a permanent technical library that can be kept up-to-date in an agile way?



Example 1



Resulting instructions:
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2nd : (53min, 8MW) -> (71min, 8MW) -> (79min, 0MW)

BP2 Draft Determination

Item 6

Daniel Delgado and Gareth Davies

Business Plan 2 (BP2) and Draft Determinations

The RIIO-2 price control timeline

BP2 timeline

Ofgem BP2 Draft Determination's - headlines

Ofgem's proposals represent a positive outcome for us:

Full support for our activities and IT investments

Ofgem believe our plans show strong ambition and to be of high value to consumers, with strong positive CBAs.

£671m Totex funding

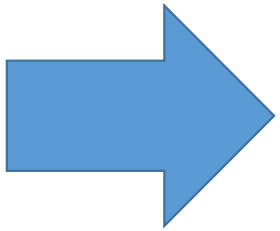
We can recover the full amount of expenditure requested to fund our activities over the BP2 period.

£21.9m

Network Innovation Allowance (NIA) funding to support innovation projects over the RIIO-2 period (90% of request)

At the same time, Ofgem do have some concerns about the level of cost increases for some of our IT investments:

- Our IT costs have been assessed with the input of their external consultant, Zuhlke, who produced an independent assessment of our IT expenditure programme.
- The assessment has raised a number of concerns on elements of our IT investments
- The energy system landscape is changing rapidly and the maturity level of investments differs across the portfolio making it challenging to "benchmark" our investments.



Given uncertainty and concerns raised Ofgem propose:

1. Setting out upfront "Value for Money" assessments.
2. Cost monitoring framework which will more closely monitor our expenditure and progress across our IT investments

Subgroups update

Item 7

Subgroups update

- No meetings since last TAC

Next meeting and discussion about arrangements for after March 2023

Item 8

Vernon Everitt

Arrangements for after March 2023

- Thank you so much for your commitment to the TAC so far
- We recognise that the original commitment was to March 2023.
- We will consult with you about whether you would like to remain on the TAC
- We would also like to consider your feedback about how we can improve the TAC in the future. **Please bring any feedback to the meeting**
- We plan to draft an update to the terms of reference to bring it up to date

Next meeting and calendar

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

- 3 March 2023

AOB

Item 9

Vernon Everitt