Balancing Programme

Quarterly engagement session

15th June 2023

ESO

Welcome

Agenda

Time	Title
09:30 – 10:00	Arrival
10:00 – 10:05	Welcome
10:05 – 10:15	BP Strategy & Vision
10:15 – 11:00	BP Benefits and Case for Change
11:00 – 11:15	BP Roadmap
11:15 – 11:30	Break
11:30 – 12:15	Breakout session 1 (OBP Demo, Balancing Trials, Dispatching Wind, Stakeholder focus groups)
12:15 – 13:00	Breakout session 2 (OBP Demo, Balancing Trials, Dispatching Wind, Stakeholder focus groups)
13:00 – 13:45	Lunch
13:45 – 14:30	Breakout session 3 (OBP Demo, Balancing Trials, Dispatching Wind, Stakeholder focus groups)
14:35 - 15.05	Designing and delivering the future power system
15:05 – 15:15	Break
15:15 – 15:30	Dispatch Transparency
15.30 – 16:00	Q and A panel
16:00 – 16.15	Close

Introductions & Aims of the day

Introduction to the Balancing Programme

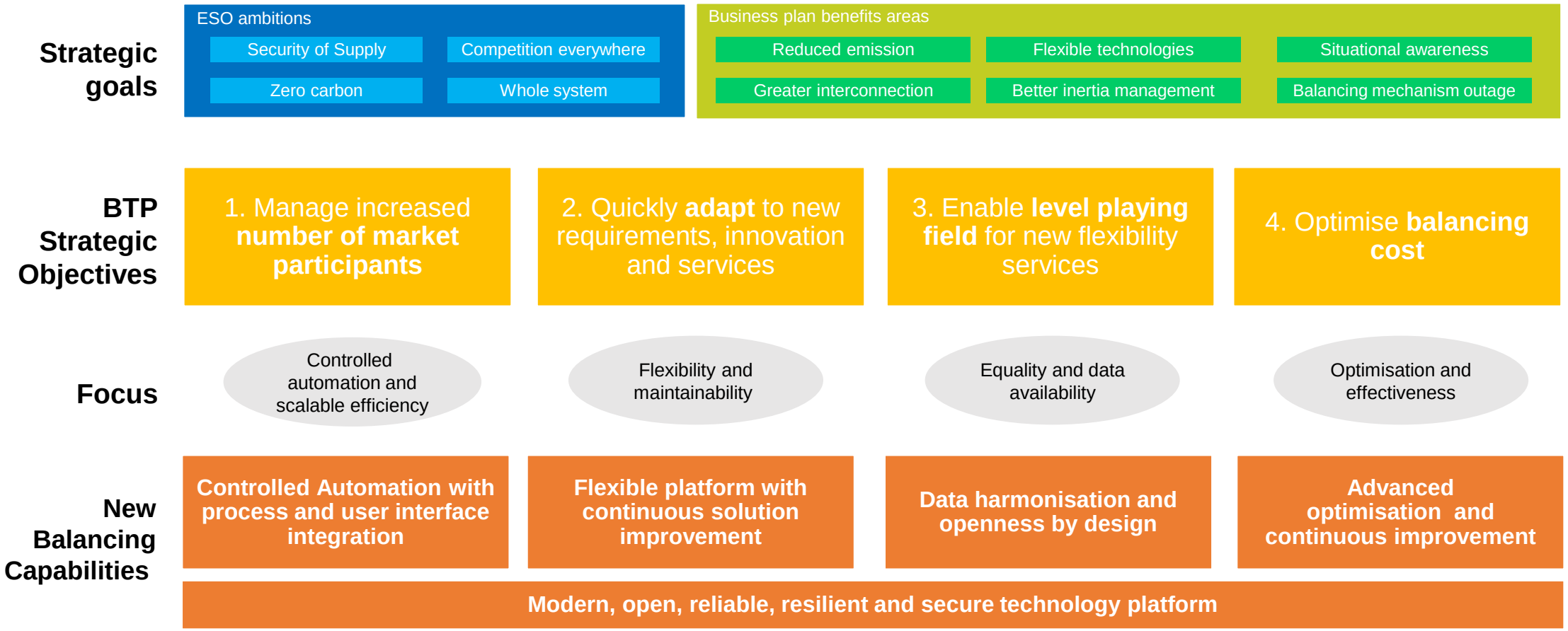
The aim of the Balancing Programme is to maintain and bring change into our **current balancing capabilities** to support Control Room operations, whilst we **transform to new balancing capabilities** that the ESO needs to deliver reliable and secure system operation, facilitate competition everywhere and meet our ambition for net-zero carbon operability.

Balancing Programme Strategy and Vision

ESO

Balancing Transformation vision

The programme strategic objectives and the new enabling business capabilities were set to address the scalability challenges and modernise the core platforms to provide increased reliability and flexibility in line with RIIO-2 business plan



Aims of today

- Our achieved progress so far and the benefits delivered
- How we are transforming our balancing capability
- A cohesive view of how we are working together to meet our ESO ambitions

- Understanding of how our transformation may impact you
- Your insight to help us tackle key challenges of transforming our balancing capabilities
- Future interests and how we continue to engage

- To validate our roadmap aligns to industry priorities
- Plan how we overcome the challenges on the road to net-zero operability

Balancing Programme Benefits and Case for Change

ESO

Current Balancing System Benefits

- **Used to balance supply and demand in real time.**
- **In BP1 we've delivered significant changes, in a highly complex environment.**

What we've delivered (BP1)

- ✓ Enabling several initiatives across ESO including DM/DR, DFS, RDP and Pathfinders.
- ✓ Improved system performance and resilience
- ✓ Improved dispatch efficiency & large reduction in control room workarounds

Future Improvements (BP2)

- ✓ Further dispatch improvements & control room efficiencies
- ✓ Additional enablers for wider ESO initiatives.
- ✓ Begin the transition and strategic migration to OBP
- ✓ Decommissioning of EBS

BP1 Benefits
£48m

Realised through reduction in balancing costs.

Key Focus Areas

Enabling Change

Resilience

Process & Dispatch Efficiencies

BP1 End of Scheme Report

BP1 (April 21 – March 23)
BP2 (April 2023 – March 2025)

Forecasting Benefits

- **Accuracy of forecasting is pivotal in the efficiency and reliability of balancing the system.**
- **The key customers of the forecasts are the market participants and the Electricity National Control Centre (ENCC)**

What we've delivered (BP1)

- ✓ Increased accuracy of National, Solar & Grid Supply Point (GSP) forecasts
- ✓ Transformation of processing & delivery time both internally and externally
- ✓ Improvement in visualisation and dashboards for control room users

Future Improvements (BP2)

- ✓ Continuous forecasting product improvements- Including new wind power generation forecasting product
- ✓ Strategic cloud platform for energy forecast (PEF) with integration to Open Balancing platform (OBP)

BP1 Benefits
£368m

Realised as savings in balancing and reserve costs due to improved forecasting products

BP1 End of Scheme Report

BP1 (April 21 – March 23)
BP2 (April 2023 – March 2025)

Benefits and the case for change

Direct benefits delivered by Balancing Transformation

Submission	2021/22	2022/23	2023/24	2024/25	2025/26	Total
Dec 2019[1]	£9.4m	£12.1m	£30.7m	£44.5m	£55.7m	**£152m**
June 2022[2]	£0m	£0.5m	£11.6m	£55.0m	£123.8m	**£191m**

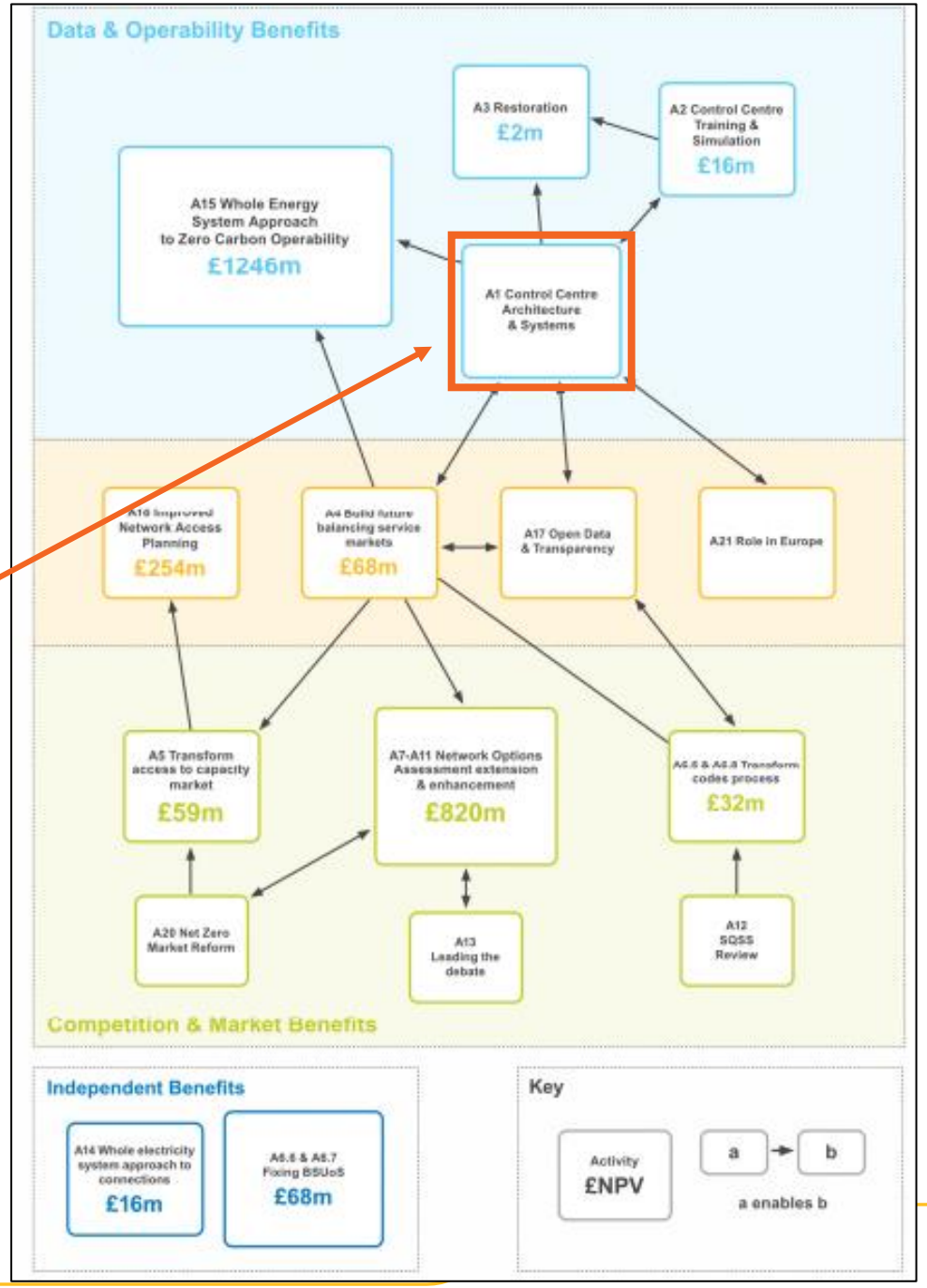
Net present value (NPV) delivered by RIIO-2 plan (enabled by Balancing and Network Control)

Submission	5 year NPV
December 2019	£1,754m
May 2022[4]	£2,581m

1 – half of the A1 CBA as submitted in the December 2019 RIIO-2 plan

2 – provisional figure for engagement only. Subject to change in final BP-2 submission

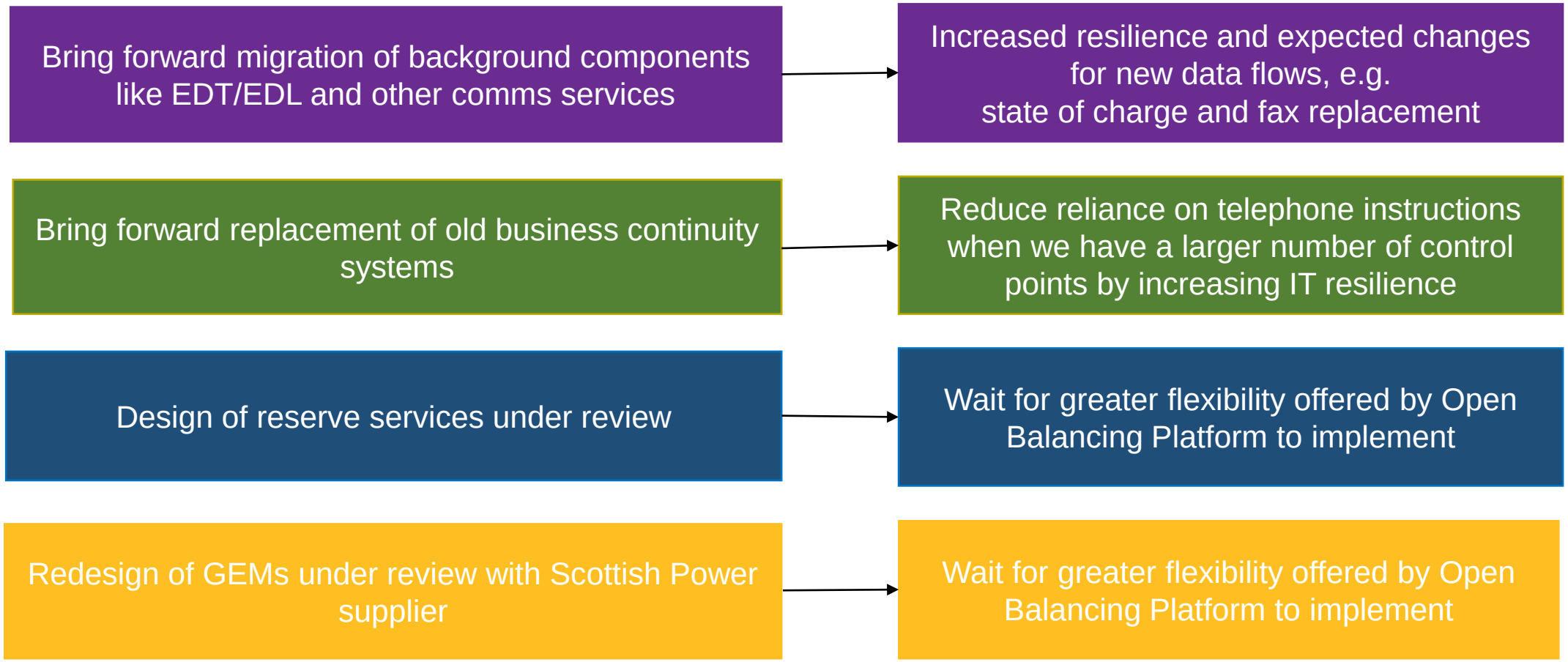
4 – figures subject to change in final BP-2 submission



Balancing Programme roadmap

ESO

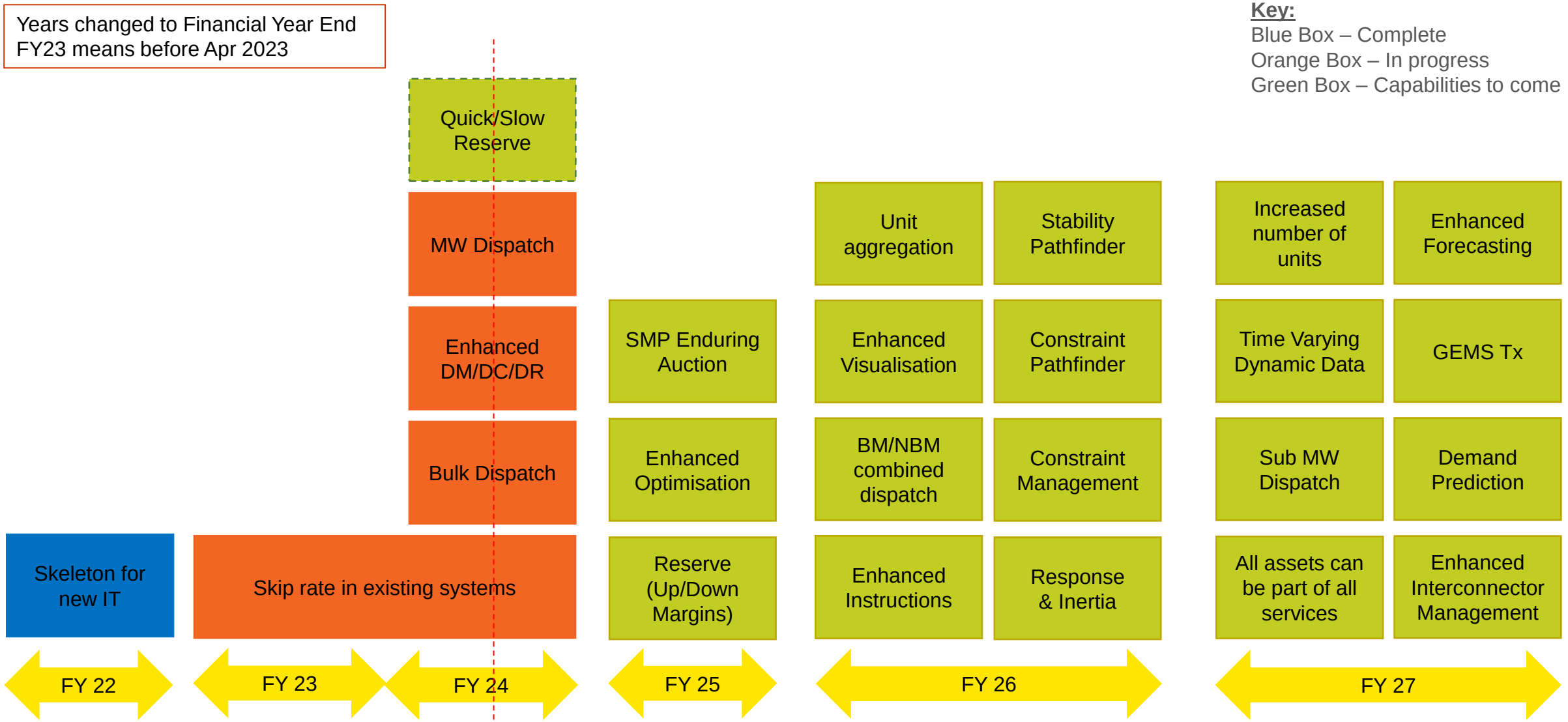
Industry Co-created Roadmap – Version 2 – drivers for change



Industry Co-created Roadmap – Version 2

Years changed to Financial Year End
FY23 means before Apr 2023

Key:
Blue Box – Complete
Orange Box – In progress
Green Box – Capabilities to come



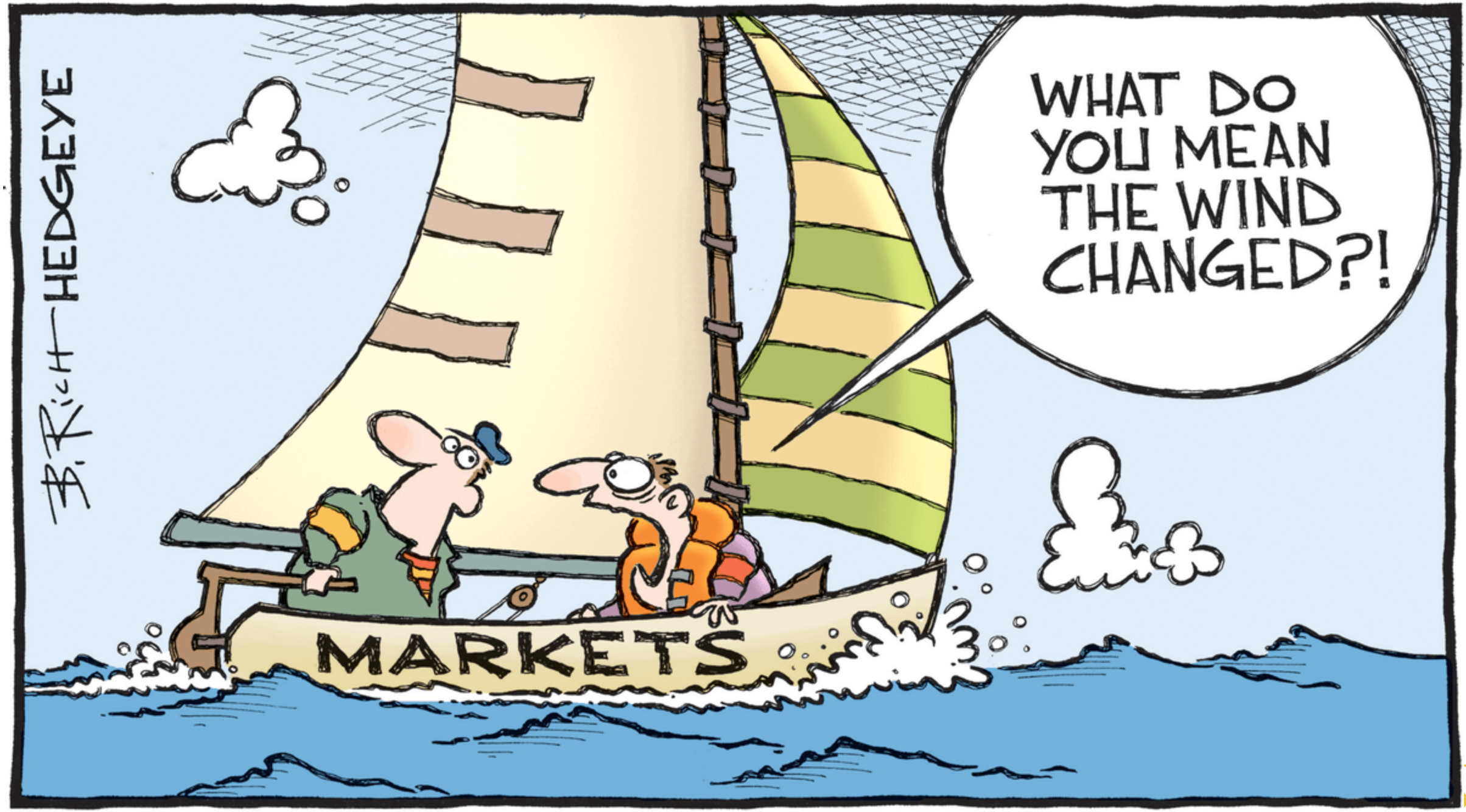
Movement – Priority in version 1 roadmap / priority in version 2

Version 2 priority	Capability	Version 1 priority
Core	Skeleton for IT	Core
1	Enhanced DM/DC/DR	1
1	MW Dispatch	1
1	Bulk Dispatch	1
1	Skip rate in existing IT	1
1	Enhanced Visualisation	2
2	SMP Enduring Auction	3
3	Enhanced optimisation	3
3	Reserve (Up/Down Margin)	5
4	BM/NBM combined dispatch	4
4	Constraint Management	3
5	Constraint Pathfinder	3
5	Response & Inertia	4

Version 2 priority	Capability	Version 1 priority
5	Stability	6
5	Sub MW Dispatch	5
5	Enhanced instructions	5
5	Aggregation	5
6	Increased no. instructions	6
6	GEMs Tx	2
6	All assets can take part	6
6	Time varying data	6
7	Enhanced IC management	6
8	Enhanced Forecasting	8
8	Demand Prediction	8
	NBM Optional Reserve	2
	GEMS Dx	5

Dispatching Wind

ESO


B. Rich HEDGEYE
WHAT DO YOU MEAN THE WIND CHANGED?!
MARKETS

The Wind challenges

- Wind accounts for a significant volume on the system, with increasing number of providers
- Wind is increasingly used to solve constraints
- There are significant manual processes to manage Wind
- Wind is volatile – PN, metered output and power available is generally unreliable
- Forecasting process is challenging
- Complex cost calculations from PN vs Volume from actual wind output

Handling wind – an interim solution

- Interim solution in OBP will seek to level the playing field
- Allows for optimisation of all wind providers
- Manages bringing Wind back on with unreliable Wind data/forecasts/PNs
- Improved forecasting and automated selection
- Handling “Zero Cost BOAs”

OBP interim solution for wind

To enable OBP to Bulk Dispatch Wind units there will be several parts of new functionality (1-7)

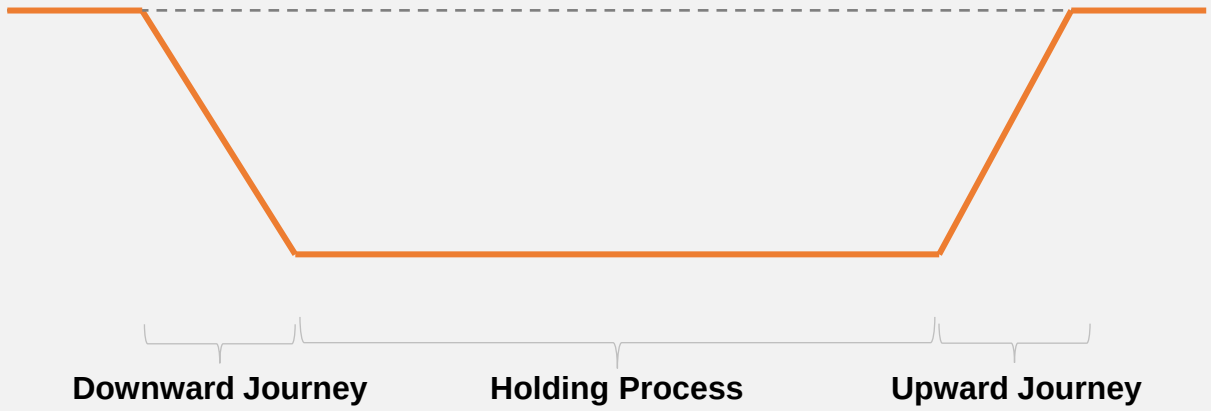
1.
Metering & PA
IEMS

2.
Selectable forecasts
PEF

Unit data
BM

3. Blending logic

4. Forecast logic



5. Use of OBP Optimiser, to instruct in price merit order

Pricing logic for Wind/zero cost BOAs

6. Monitoring and extending of active instructions

Visualisation of forecasts

7. Semi-automatic ‘step back’ of wind units, individually or in bulk level

Downward journey

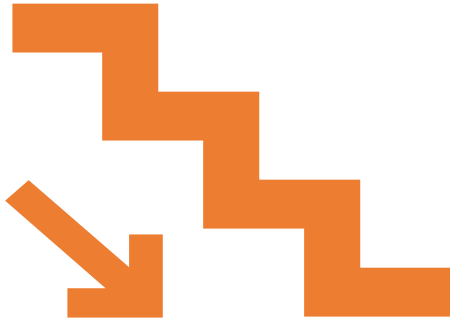
Improved Forecasting and Forecast selection (based on matching recent history with Forecast). This will allow us to use the Optimiser to reduce the wind output for managing active constraints

Interim solution will use the OBP Release 1.0 optimisation capability already developed, with additional support Wind

Requirements will be either set for a Target Zone, or a Constraint limit

We will be able to take a Wind unit to SEL, or 0 – depending on their M(N)ZT values, and instruction length required

Optimiser will take into account “true cost” vs volume received, allowing for issues with Wind data, i.e. Zero Cost BOAs



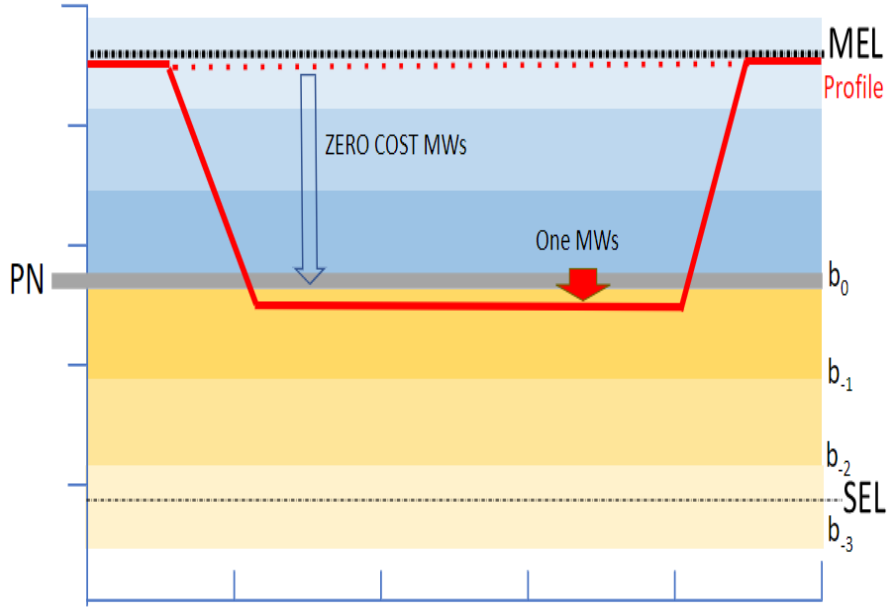
Managing zero cost BOAs for constraints management

For Wind (or any) units that are generating above their PNs, then any instruction to bring the unit to the PN would be at zero cost – i.e. a zero cost BOAs

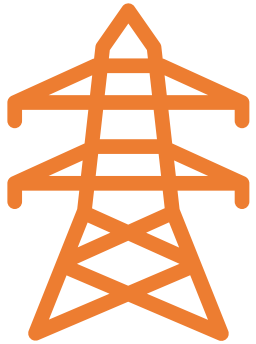
Therefore, the cheapest set of actions, in an active Constraint scenario, is to take all the zero-cost volume for any units that are generating above PN

Proposal is to create instructions to take over generating Wind units to at **least 1MW below their PN**

If more MWs are required, then the optimiser would consider costed MWs below PN in an economical manner (i.e. price merit order, taking into account the overall requirement shape and dynamic parameters)



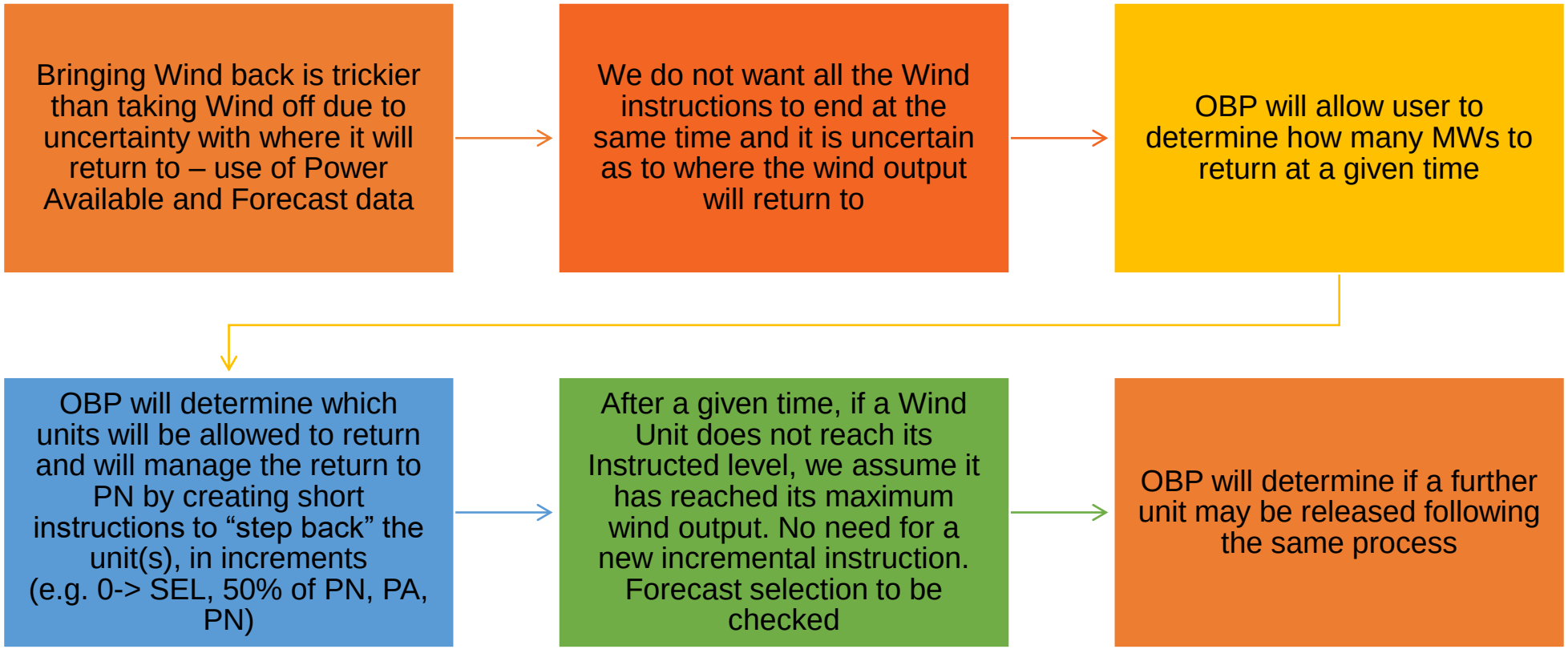
Holding process



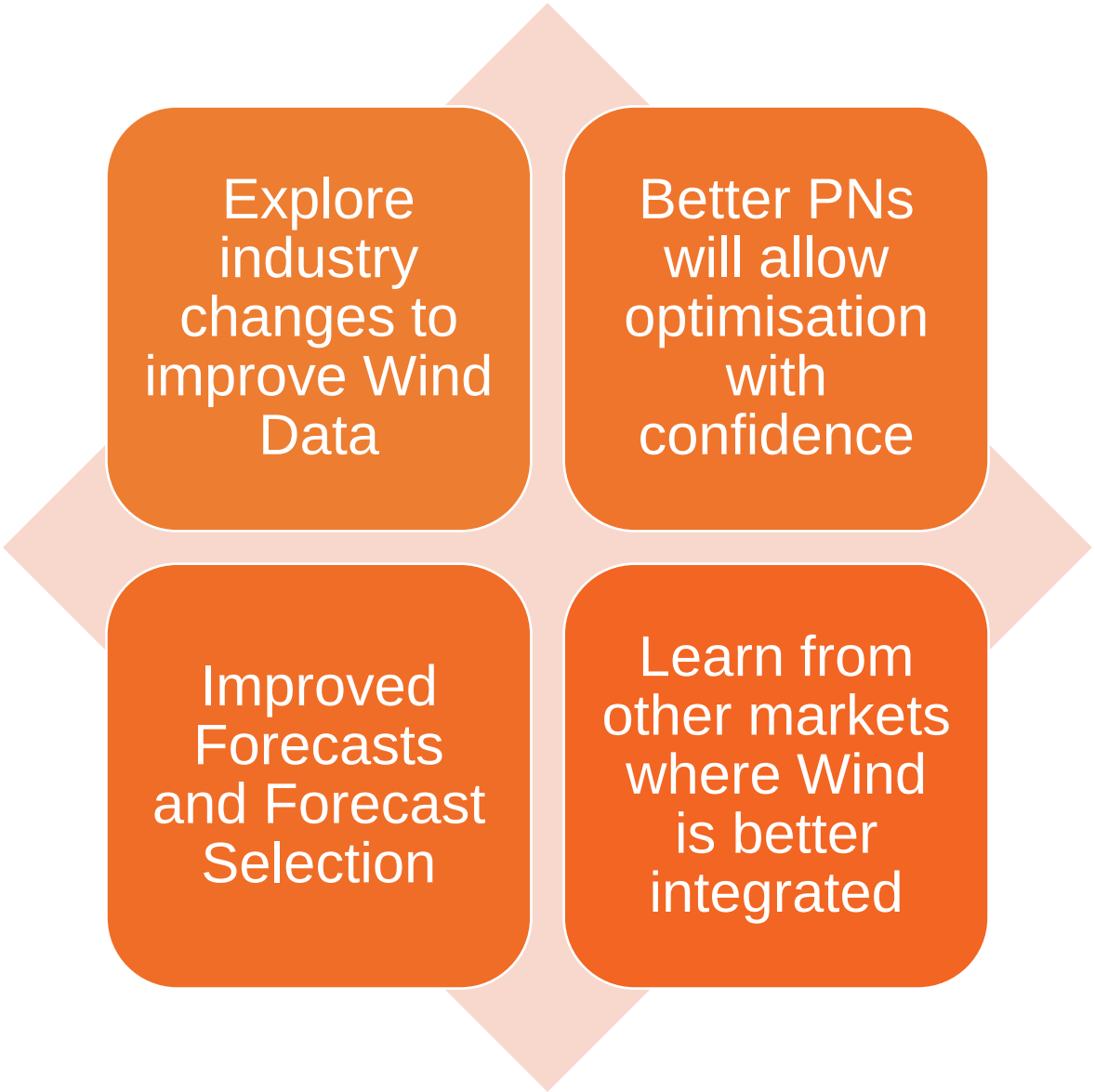
The system will continue to monitor instructed wind units and in an ongoing constrained environment, the instructions will be automatically extended subject to dynamic parameters, PN, forecasts (etc.) and being in merit order

Where dynamic parameters, PN, forecasts or changing prices impact the merit order, users will be made aware to investigate/take action

Upward Journey



Strategic Wind approach - next steps



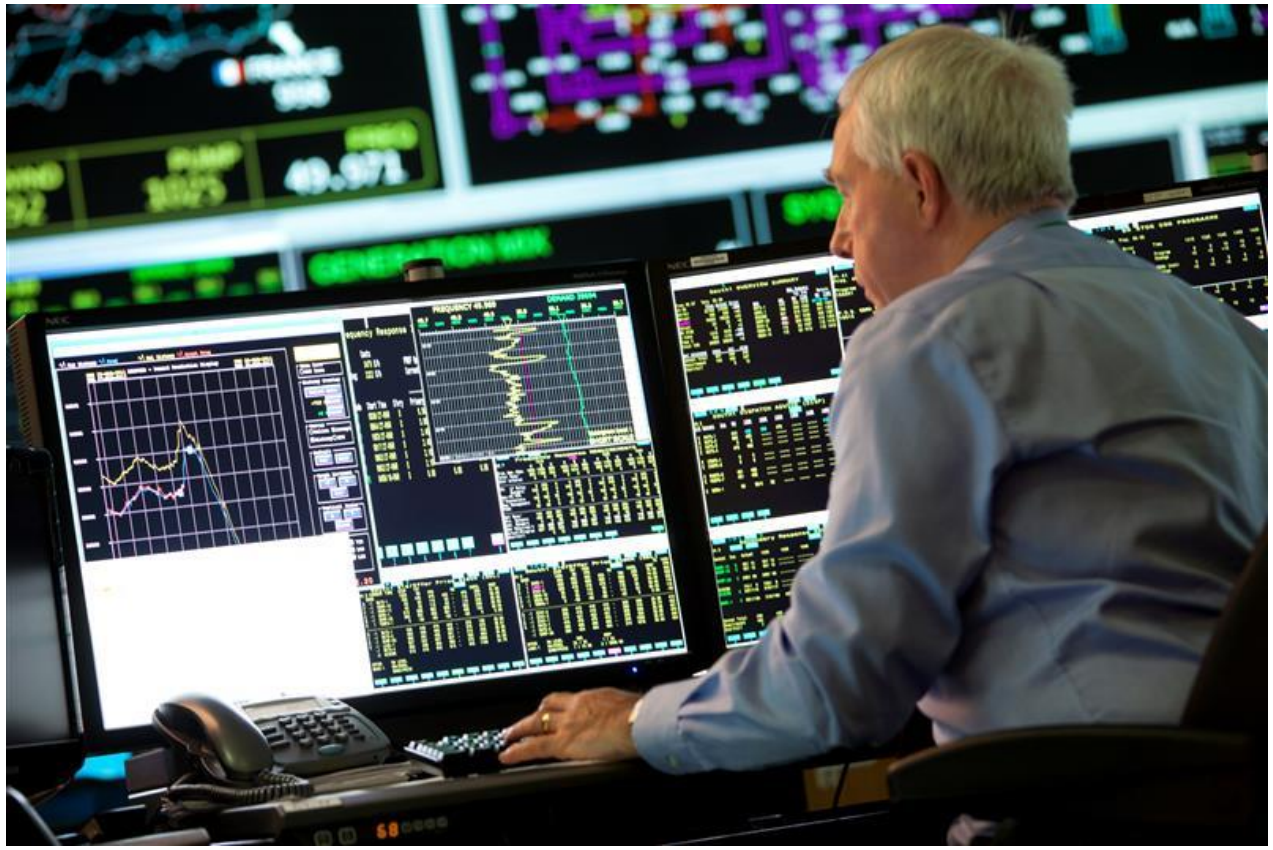
OBP Demo

ESO

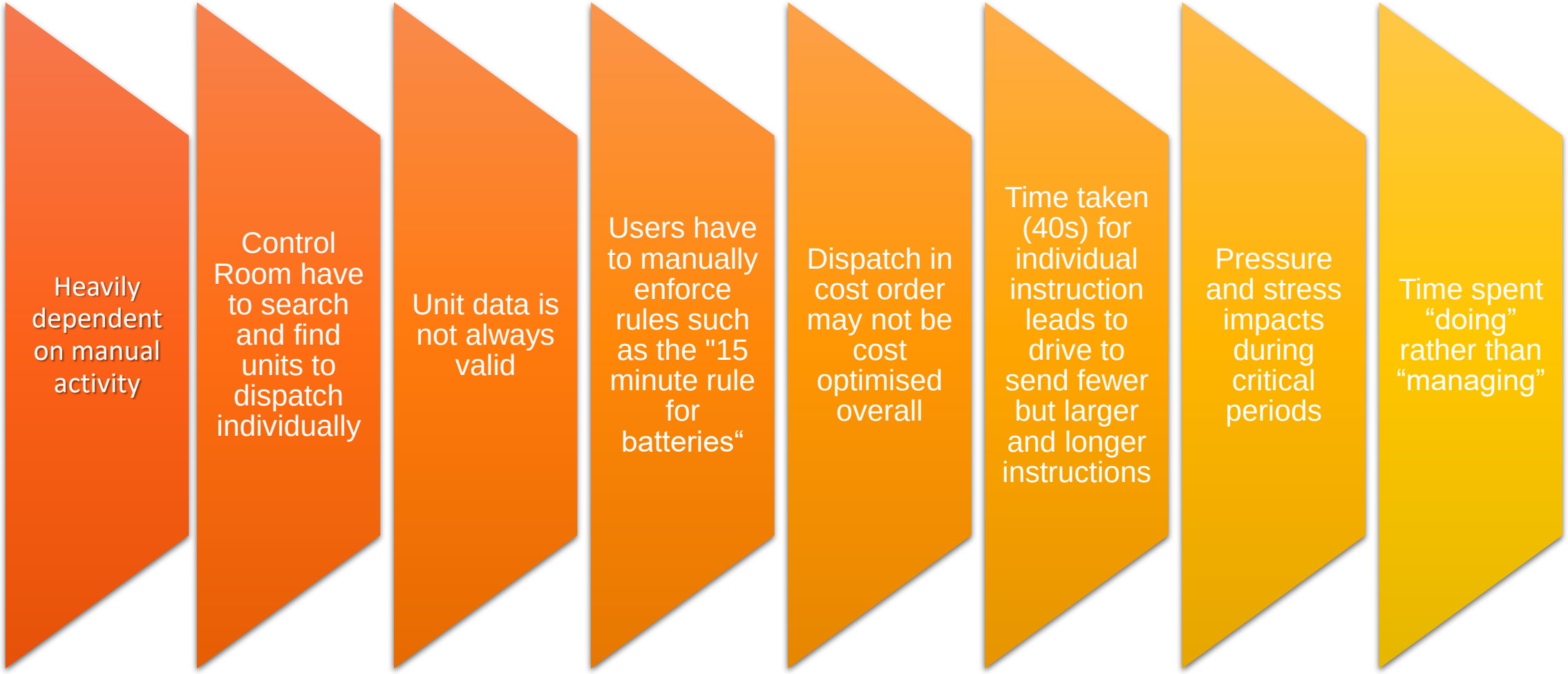
The problem of scale: National Balancing

The Control Room has a manual based process for the interpretation of optimisation and subsequent dispatch

With increasing number of smaller units, the Control Room has an urgent need to scale and automate its processes for optimisation, dispatch and monitoring



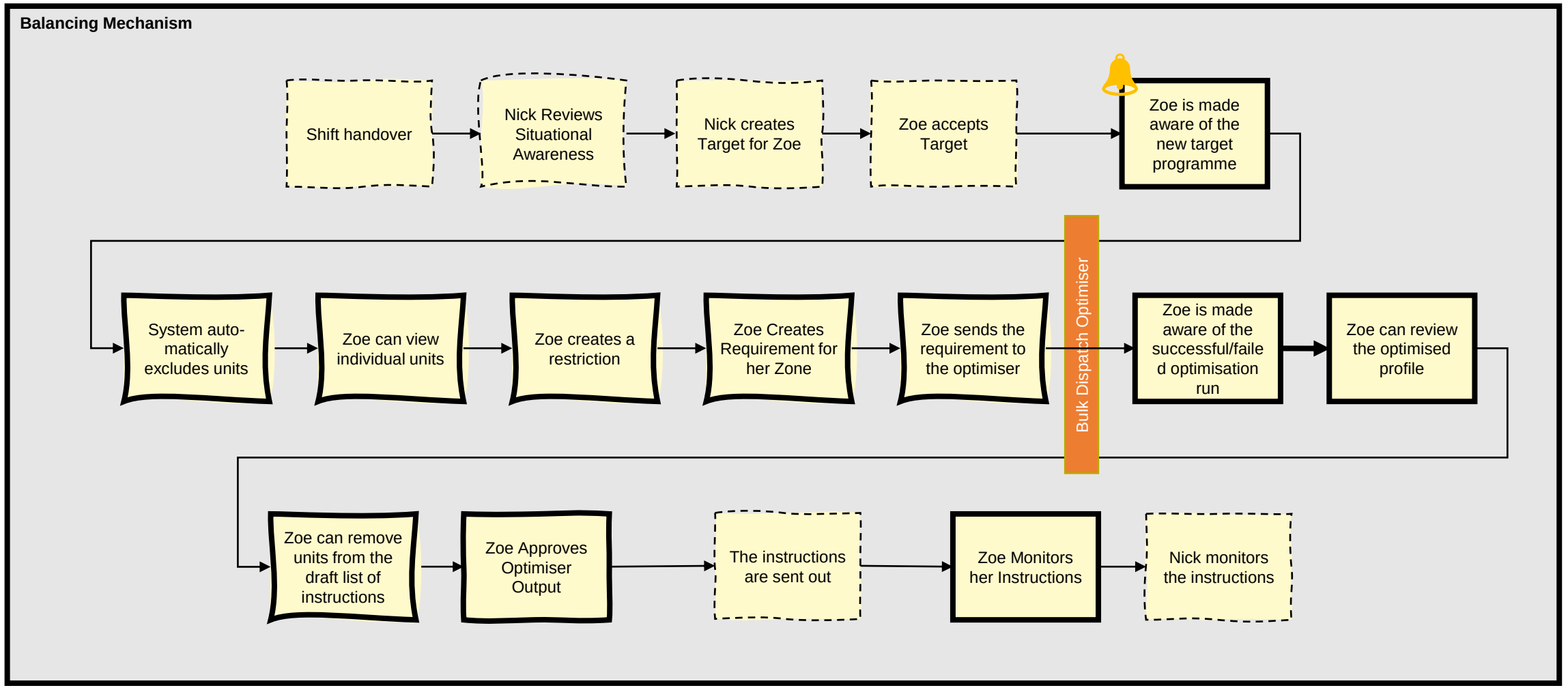
Today’s challenges in the Control Room



OBP Release 1.0 Storyboard

OBP | Existing

Notifications only shown for the relevant ZBE



Instruction Volumes – Release 1.0

What will happen to dispatch efficiency and hence to the dispatch rate of smaller units when **competitively priced**?

Should we expect a dramatic increase in dispatch or a gradual rise over a long period?

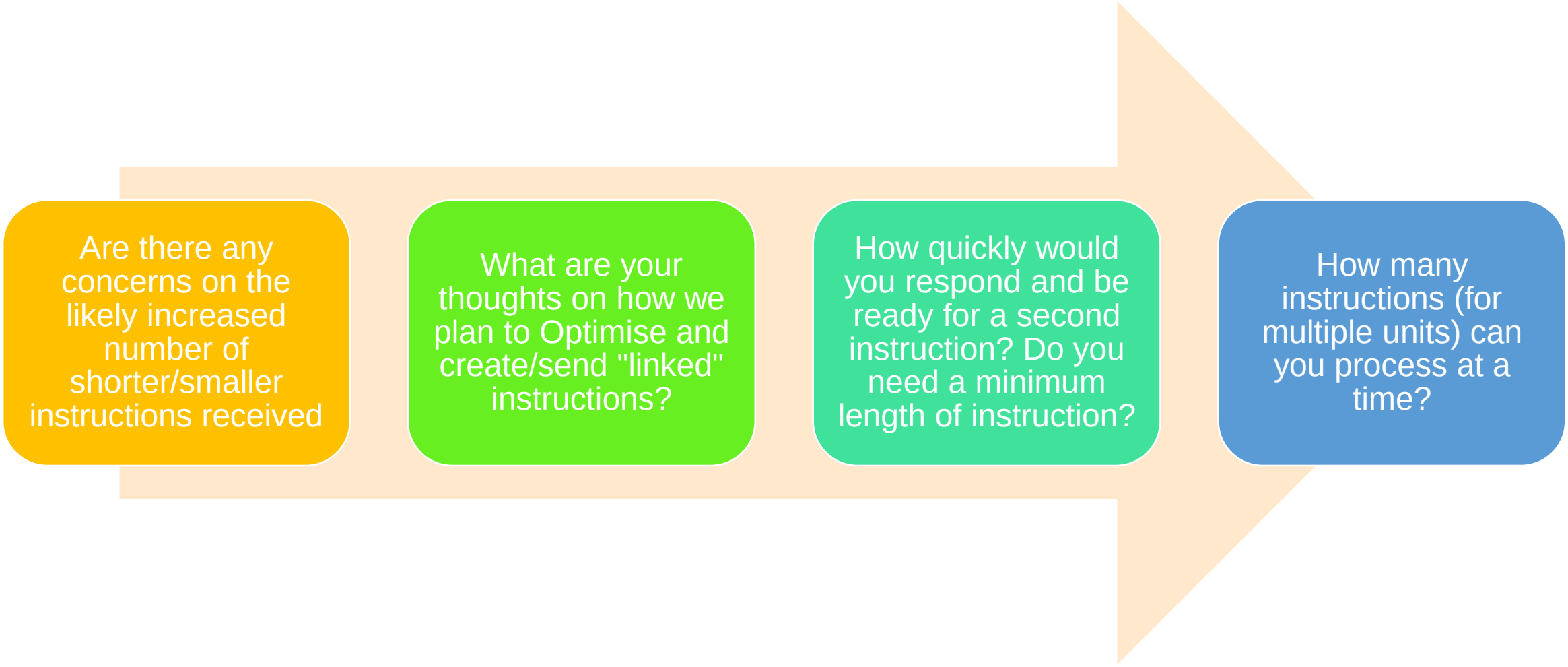
4-8 Optimisations per hour

Up to 300 Instructions per Optimisation Run

Each Unit can receive, at most,
1 instruction per minute “LOG_TIME”

Providers with multiple units may receive multiple instructions in a minute

Optimisation, Instruction Creation & Sending



Optimisation – Feedback from Feb 2023 Event

Scenario 1
Flat Top Time

There would need to be a maximum flat top duration
Wasn't aware this was standard practice now t.b.h
JD

Makes sense technically – only Q is whether 5 minutes is enough for all technologies (e.g. CCGTs)

What is the objective function and will this favour flat tops?
TF

Scenario 2
Min delta MW

Surely this is an issue for conventional generation not batteries

Is this available for storage?

Part of the reserve/balancing product parameters ?
TF

What about sending delta to the units rather than volume?
SIMA

Scenario 3
Near MEL, MIL, SEL, SIL action

Makes sense technically - but closer to net zero will "rounding up" (e.g. 95MW to 100MW OCGT gas plant unabated) increase emissions vs bringing up low carbon generation?

Unclear on the benefits to balancing costs
TF

For thermal units this will be heavily ambience driven
Not sure this is required

Not required if you do scenario 1 + 2

Would this be gameable?

Is this done in post-processing or included in the optimisation model?
JB

Scenario 4
Splitting large MW instructions

Given the make up of future system this is not a big issue

Optimising across multiple assets for the sake of ramp rates is a bandage for being stuck with minute resolution

How would this work for BESS?
HM

How does this interact with new reserve products?
TF

Seems sensible from a risk perspective

Optimisation – Feedback from Feb 2023 Event

Scenario 5
State of Energy

Using MEL/MIL is inefficient as start to lose power availability within 15 minutes
State of Charge rather than Energy is good
WH

Isn't this for providers not ESO to determine?

Does this need a grid code change initially or could storage provider provide ta duration parameter voluntarily via an API?

What are the alternatives if you don't use SOE? Struggle to see you'd manage otherwise
JB

MIL, MEL and max import & export duration should feed into the optimiser

SOE of the unit is not necessarily all commercially available

1MWh may cost less to get back than the next MWh for a battery. It would be useful to be able to give different prices to different MWhs in the same way gas units can have different prices for different units

Most useful would be to give MWh high and MWh low available, so optimisers can manage their SOC with respect to ancillary contracts and planned trades (would this be rounded?)

Scenario 6
Max number of instructions

Where does Active Network Management fit in this?
Sam Bolterill

Can we set a default value? It depends also on unit recovery time
SIMA

Need to formally ask generators what they can do. This must be a known factor

Bring it on

Can this be a user parameter?
TF

Balancing Trials

ESO

We are developing new ways to balance electricity supply and demand and manage a low carbon electricity system

We use trials where there is **uncertainty** or a **knowledge gap**, allowing us to **'learn by doing'**

Running trials can help:

- Test innovative ideas in a safe environment
- Increase collaboration across the industry
- Encourage a 'fail fast' mindset, where ideas are tested before large resource is put behind it
- De-risk and/or streamline the launch of new services

Trials can support ESO and the industry:

- Move towards a zero-carbon GB electricity system by 2025 and continue towards fully decarbonised by 2035
- Reform ESO's ancillary services and balancing markets to make markets more efficient, accessible and liquid
- Identify potential capabilities that reduce or shift peak demand energy consumption or generation
- Ensure reliability, affordability and fairness for all

The ability to trial new capabilities will benefit the entire industry and unlock value

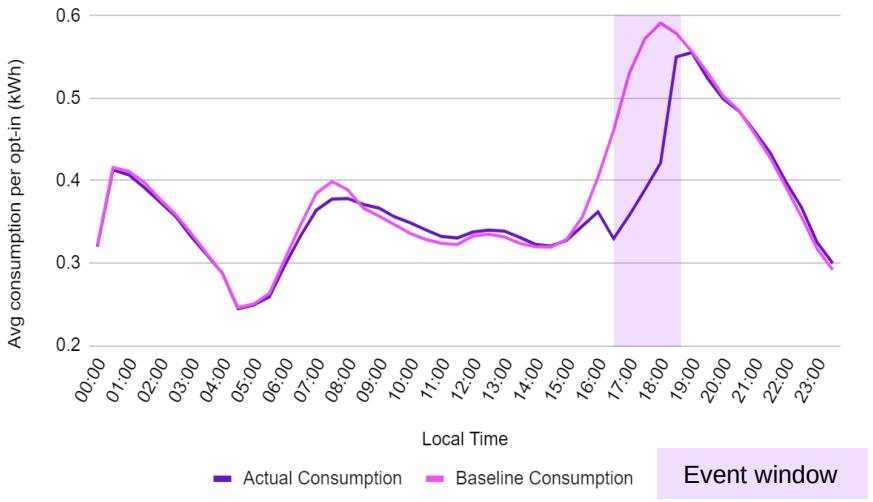
What have trials delivered so far

Domestic Reserve Scarcity trial

Creating the pathway to the world leading Demand Flexibility Service

> 100,000	Households participating in demand turn down events
8	Events between Feb – Mar ‘22
197 MWH	Demand turn-down volume

Demand Profile for Event 1: 16:30-18:30



Powerloop

Identifying the barriers and capabilities of domestic EV chargers operating in balancing activities

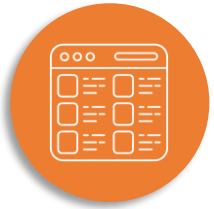
Demonstrated the ability to alter **charging behaviour in response to instructions** from the ENCC to meet energy imbalances

- **Reduce balanced costs** - potential of cheaper energy balancing option than currently available
- **Value for participating consumers –** Improved tariffs due to BM participation leading to reduced running costs

Highlighted barriers in current market framework and a pathway for smaller-scale aggregated assets entering the BM

REVEAL is an innovation project looking to provide tools to make the trialling of new capabilities easier and faster for the ESO and external stakeholders

Our aim for REVEAL is to:



Enhance robustness for future trials

Increase industry collaboration

Make it easier and faster to run trials

Increase capacity for running more trials

Encourage and test innovations

What is your understanding of REVEAL?

Sli.do #BPevent

REVEAL Quiz

1. The scope of REVEAL is...

A A tool where live trials can be facilitated

B A tool to help organise trials and facilitate collaboration

C Clear processes to support the function of trials

D Supporting developing an enabling regulatory environment for trials

2. The number of stakeholder groups engaged in Phase 3 of REVEAL…

A 27

B 89

C 110

D 68

3. Phase 3 has delivered…

A Roadmap for implementation

B High-level technical designs

C Business case

D Stakeholder engagement with ESO and wider industry

REVEAL Quiz

How feedback was incorporated into REVEAL design (you said, we did)

4a. You said: Open communication and ideation with ESO is critical

A We did: Defined processes that allow only ESO to suggest trial ideas

B We did: Added the option to receive trial notifications to future phases

C We did: Added a form to suggest trial ideas to future phases

4b. You said: Transparency in the trial process is important

A We did: Added a feedback mechanism for participants to future phases

B We did: Added a dashboard showing an overview of all trials to future phases

C We did: Created a generator to select trials and participants at random

4c. You said: Clear and accurate information is essential for trial planning

A We did: Developed a clear comms plan to support trials from start to finish

B We did: Defined new processes to ensure sufficient information is shared from the start

C We did: Created a generic information pack that is handed out at the start of every trial

5. REVEAL Phase 4 involves...

A Further discussions to define REVEAL

B Building a Proof of Concept (POC)

C No next steps at this stage

REVEAL's solutions

We have defined and designed two technical solutions and supporting business change processes – which will help facilitate the trialling of new capabilities and industry collaboration – underpinned by an enabling regulatory environment.

Business Change

Developing clear processes, organisational design, governance structure and a realistic implementation roadmap

Live Trial Environment

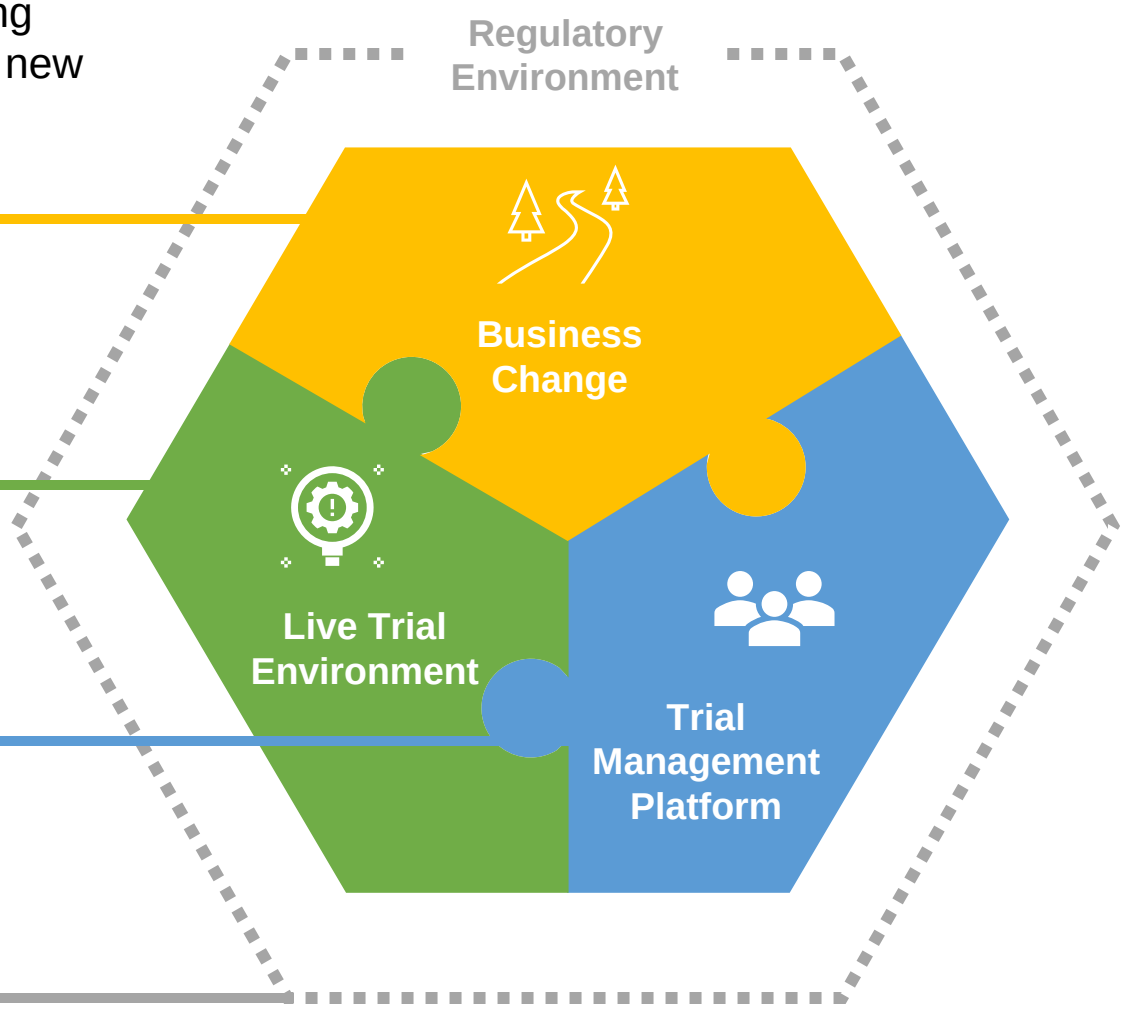
A dedicated, configurable environment for the execution of live trials

Trial Management Platform

A web-based set of tools for communication, trial planning and information sharing (ESO and industry)

Regulatory Environment

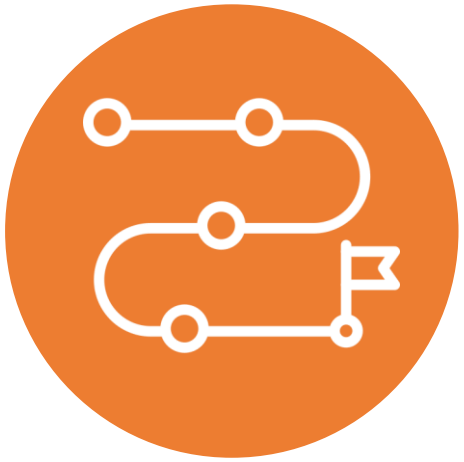
Focus on supporting development of policy-led sandbox and identifying ways to potentially streamline the derogation process



Next steps

Reflection

REVEAL team to review outputs from today's discussions and feed into our plans



Phase 4

First stage is building a POC

Involvement of industry

Further updates shared through usual channels

Further engagement with REVEAL team

Sharing trial ideas

Stakeholder focus groups

Groups

Forecasting

- Sumit Gumber
- One meeting to date
- Feedback on Terms of Reference and Forecasting Problem & Improvements

Optimisation

- Emmanouil Loukarakis
- One meeting to date
- Feedback on Terms of Reference and Ways of Working

Storage

- Natasha Bayler
- Five meetings to date
- Now moving to Grid Code changes

Optimisation Stakeholder Group Terms of Reference

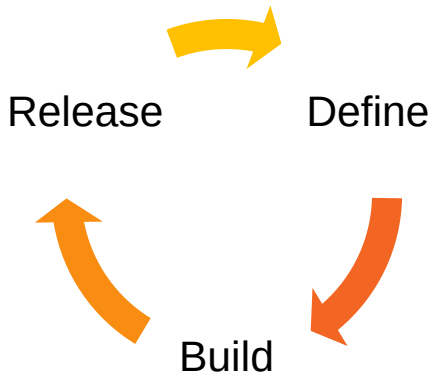
Remit

- Align internal balancing enhancements with industry expectations
- Active involvement in sessions to identify and work through problems and opportunities
- Provide details on how new optimisation algorithms are intended to work
- Receive feedback from market participants
- Share test results and examples with market participants
- Allow market participants to suggest their own test cases
- Provide greater understanding of when decisions may be taken “out of merit” due to transmission system constraints
- Work together to understand the current pain points of market participants
- Identify changes that may be need to industry codes to reflect evolving practice

Engagement

Engage with stakeholders monthly on an ongoing basis. Will have a mix of remote and in person events. We will also be available to have a 1:1 meeting if any stakeholder would like this.
We welcome your input to ensure we develop plans that are ambitious and achievable and have considered the priorities of our stakeholders.
We propose to have dedicated collaborative forum events to gather your views as set-out below:

Phase 1 - Define	• Outline current ESO and industry capabilities • Understand and feedback on market participant challenges and pain points	• Capture future requirements • Review transformation and new capabilities to be developed • Challenge and clarify assumptions
Phase 2 - Build	• Prioritise capabilities that will give the greatest benefits • Consider costs of development	• Understand how to transition from existing to new capabilities
Phase 3 - Release	• New capabilities that support the roadmap for the balancing programme • Maintain clarity on current and future developments	• Plan for future industry engagement to progress together • Keep stakeholders involved and informed on a regular basis



Logistics

- The stakeholder group will be an open forum for new attendees to join at any point.
- Sign up details will be through MS forms and will be shared on the website and via email.
- We will send meeting details by email and on the website.
- We will share the outcome of each event following the 1st phase, as well as questions and answers on the ESO website.

Comments on Optimisation Terms of Reference

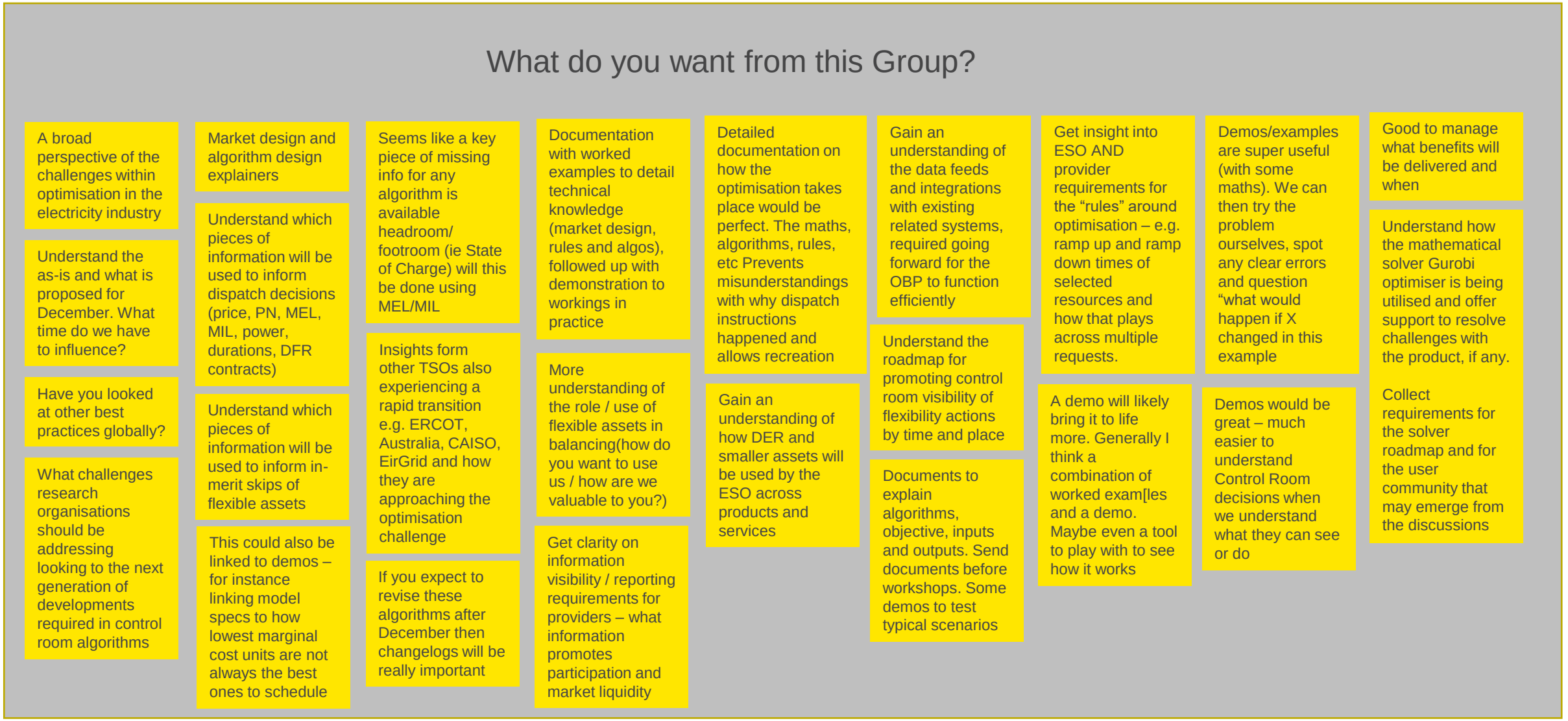
What do you like?

- Regular opportunity to meet, collaborate, share
- Ways to get people to interact like this board
- Regular feedback opportunities
- How optimisation
- The open communication that is happening
- Quality of data released by ESO – far greater than other markets
- Allowing the industry to help shape development
- ESO openness to collaborate and take input
- These collaboration sessions are very welcome

What could be better?

- Data reliability – frequent outages of balancing data
- Whistle stop introductions don't give enough information on people experiences and expectations. Is there somewhere we can write this and store
- More opportunity to feedback (or consideration) on technical aspects of BESS (or other assets) in relation to how they operate within markets
- Data quality and handling – data format can be inconsistent and hard to retrieve
- Greater transparency on how the ESO solves the optimisation problem
- Fair & applicable treatment enforcement of industry rules across tech types
- More information of what the ESO is looking to achieve or solve via new products or services
- Define, build, release timeframes – setting expectations
- Roadmaps need to be updated monthly

Optimisation – What do you want from this Group ?



Storage Stakeholder Group Terms of Reference

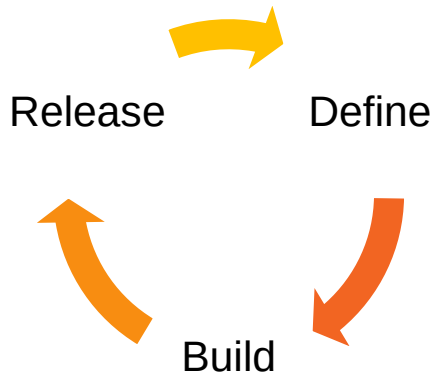
Remit

- Align internal balancing enhancements with industry expectations
- Active involvement in sessions to identify and work through problems and opportunities
- Work together on potential grid code changes to allows for smooth transitions
- Provide an empathic voice for storage market participants within the balancing programme
- Work together to understand the current pain points of market participants
- Work with the group to put forward changes to current processes such as the “15min battery workaround”
- Align our internally generated personas with market participants
- Agree future ways of working and operational parameters for limited storage units

Engagement

Engage with stakeholders monthly on an ongoing basis. We will have a mix of remote and in person events. We will also be available to have a 1:1 meeting if any stakeholder would like this.
We welcome your input to ensure we develop plans that are ambitious and achievable and have considered the priorities of our stakeholders.
We propose to have dedicated collaborative forum events to gather your views as set-out below:

Phase 1 - Define	• Outline current ESO and industry capabilities • Understand and feedback on market participant challenges and pain points	• Capture future requirements • Review transformation and new capabilities to be developed • Challenge and clarify assumptions
Phase 2 - Build	• Prioritise capabilities that will give the greatest benefits • Consider costs of development	• Understand how to transition from existing to new capabilities
Phase 3 - Release	• New capabilities that support the roadmap for the balancing programme • Maintain clarity on current and future developments	• Plan for future industry engagement to progress together • Keep stakeholders involved and informed on a regular basis



Logistics

- The stakeholder group will be an open forum for new attendees to join at any point.
- Sign up details will be through MS forms and will be shared on the website and via email.
- We will send meeting details by email and on the website.
- We will share the outcome of each event following the 1st phase, as well as questions and answers on the ESO website.

New Parameters for limited duration assets - Approach to Grid Code change

Questions we asked at last Storage Stakeholder Group

- Would simple parameters like Maximum Delivery Volume (Export/Import) – MDVE and MDVI be worth pursuing?
- Do we need a maximum period as well? (current rules have this but do we need export/import?)
- Should these be time-varying?
- How do we use batteries longer term?

Replies so far

- Immediate replies from the day are available on mural board
- Two parties have sent detailed analysis and their own suggestions (which is very appreciated)

What do you think?

- Please use post-its to give feedback

New Parameters for limited duration assets - Approach to Grid Code change

What do you think the change should look like?

Feedback 1

- Go for MDVE/MDVI now
- Longer term too complicated for ESO to optimise all assets – providers to send this to ESO

Feedback 2

- Should give ESO all details to optimise
- Some details would have to be confidential (efficiency etc)

Forecasting Stakeholder Group Terms of Reference

The purpose of this forum is to establish a working group focused on improving the transparency and accessibility of energy forecasting data, increasing the accuracy of energy forecasts, and exploring innovative methods of forecasting through the use of new data and modelling techniques.

The group will collaborate with industry stakeholders to align ESO's forecasting enhancements with their expectations, and continuously engage with them to develop plans that are ambitious and feasible.

Objectives

- Improve the transparency and accessibility of energy forecasting data
- Improve the accuracy of Energy forecasts (Demand & Generation)
- Explore innovative methods of forecasting using new data and modelling techniques.
- Collaborate with stakeholders to align forecasting enhancements with their expectations

Stakeholder Collaboration & Engagement Process

- Learn from stakeholders' experiences and understand their current pain points in forecasting
- Plan and implement improvements for the future of forecasting in line with the balancing programmes forecasting roadmap and the evolve initiative
- Engage with stakeholders bi-monthly* on an ongoing basis, both remotely and in person.
- Encourage stakeholder input to ensure plans are ambitious, achievable, and in alignment with industry priorities

Logistics

The working group will operate as an open forum, allowing for new attendees to join at any point during the process.

Sign-up details will be available through MS Forms, with the information shared on the website and via email.

Meeting details, as well as any changes, will be communicated through email and posted on the website.

The outcome of each working group meeting, from the first meeting onwards, will be shared, along with related questions and answers, on the ESO website

Forecasting Working Group – May meeting summary

What We Discussed

Reviewed Terms of reference

Provided update on Forecasting Roadmap

Forecasting Problem – Re-Cap
- How do we forecast
- Virtual demand
- Visibility of embedded generation

Forecasting Improvements
- Wind Power forecasting improvements
- Step towards modelling non-renewables embedded generation

What could be better?

Information on when New Forecasting product / model in implemented

Understanding of Virtual Demand

Information on when existing model is updated / changed

Publication of virtual demand

Historical Information on forecasting models

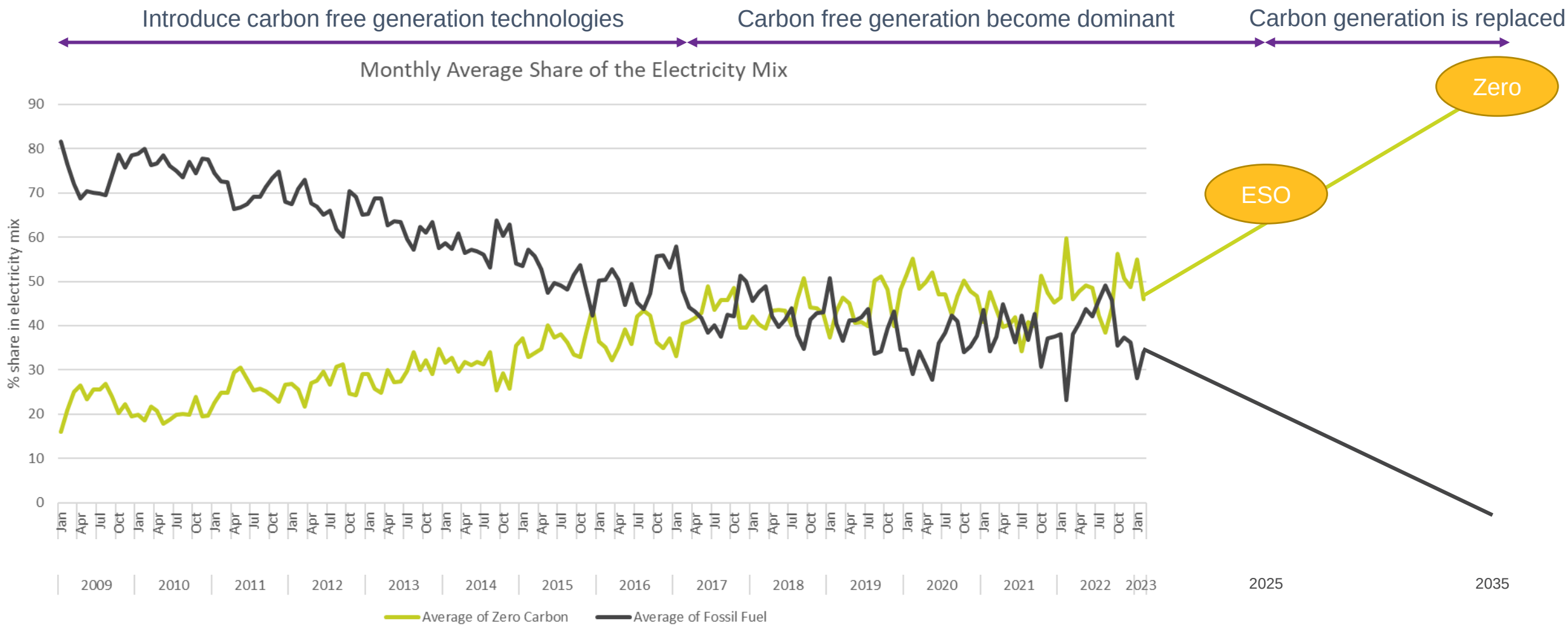
Understand all inputs to our forecasting models (List of Model inputs)

Real time system demand

Designing the future power system

ESO

The carbon journey so far



By 2025 the ESO has a target to operate the Transmission network carbon free for short periods
By 2035 the electricity network needs to operate carbon free all year round

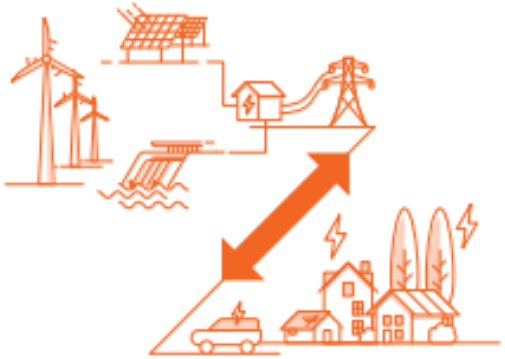
The current challenges and how we are meeting them

Increased amounts of decarbonisation of the electricity system has resulted in changes in four key areas:

Less dispatchable generation

More asynchronous generation

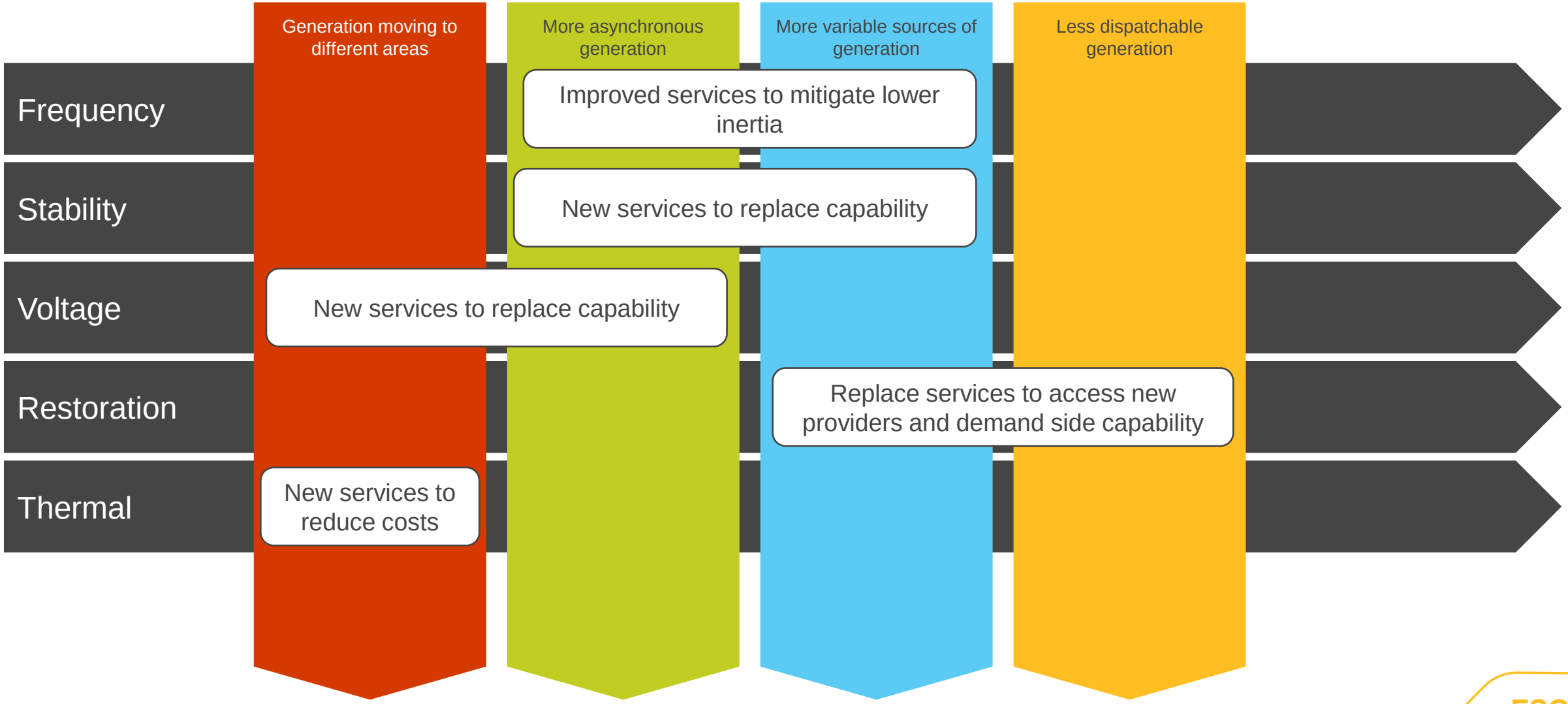
More variable sources of generation



Generation moving to different areas

The current challenges and how we are meeting them

Each of these changes brings about five **engineering challenges** which have to be resolved using new and existing technology to operate a zero carbon network.

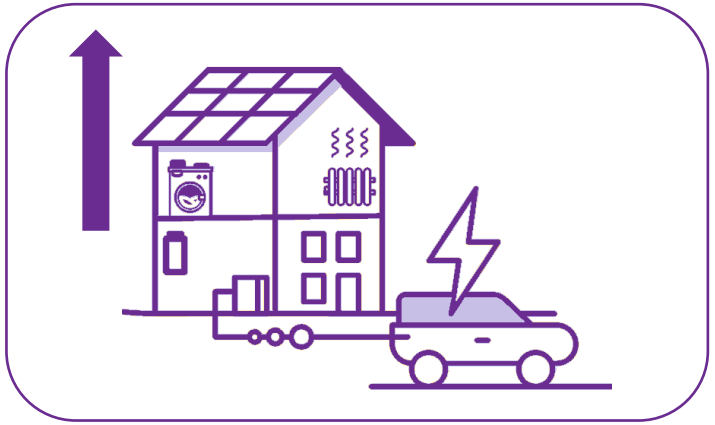


The gap to 2035

Year round zero carbon operation in 2035 introduces a further change and two further **challenges** to system operation.

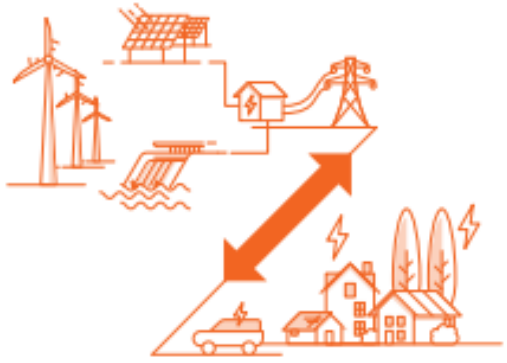
Less dispatchable generation

More asynchronous generation



More variable and unpredictable demand

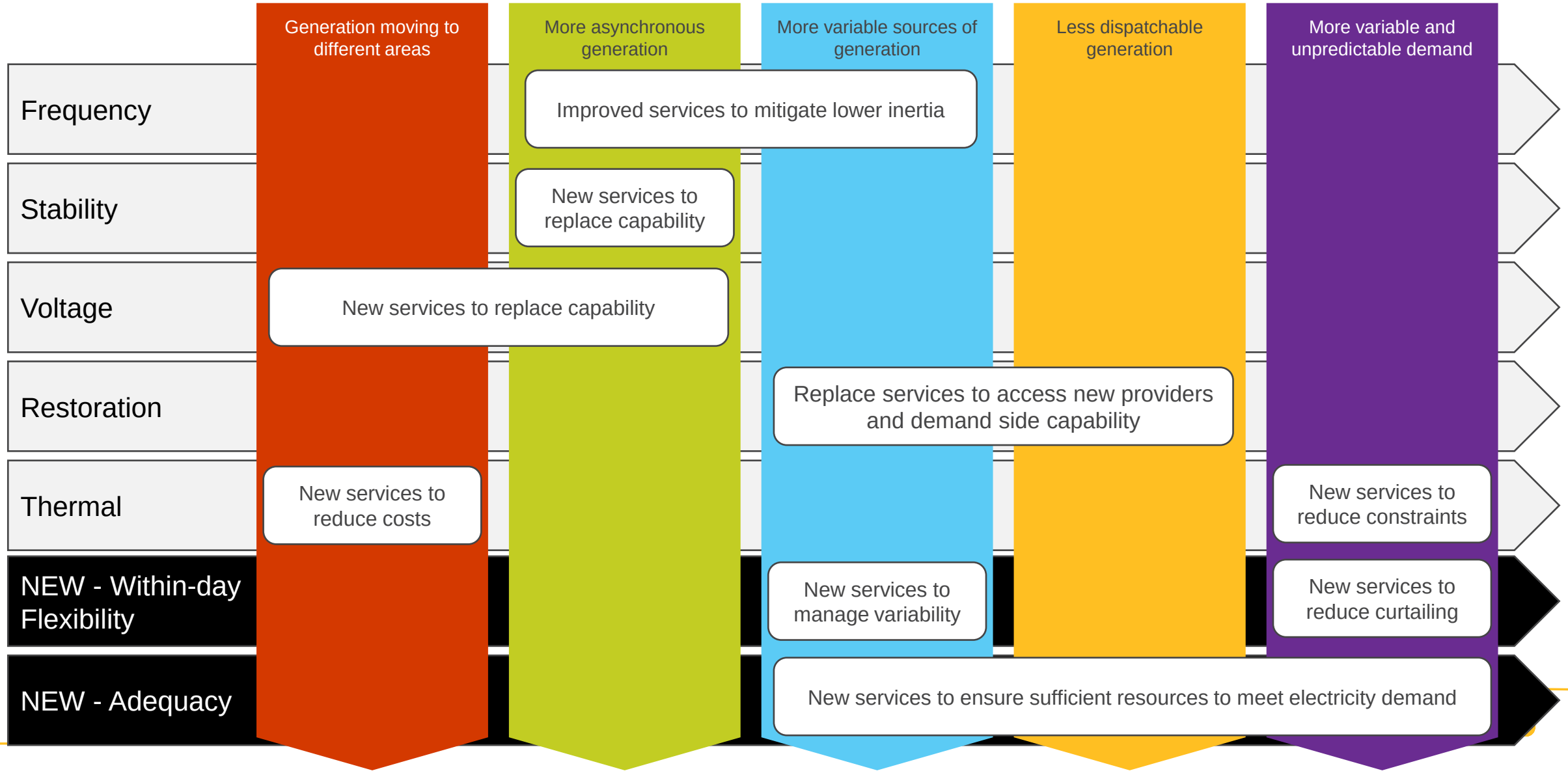
More variable sources of generation



Generation moving to different areas

The gap to 2035

Getting to zero carbon operation in 2035 introduces a further change and two further **challenges** to system operation which have to be resolved using new and existing technology to operate a zero carbon network.



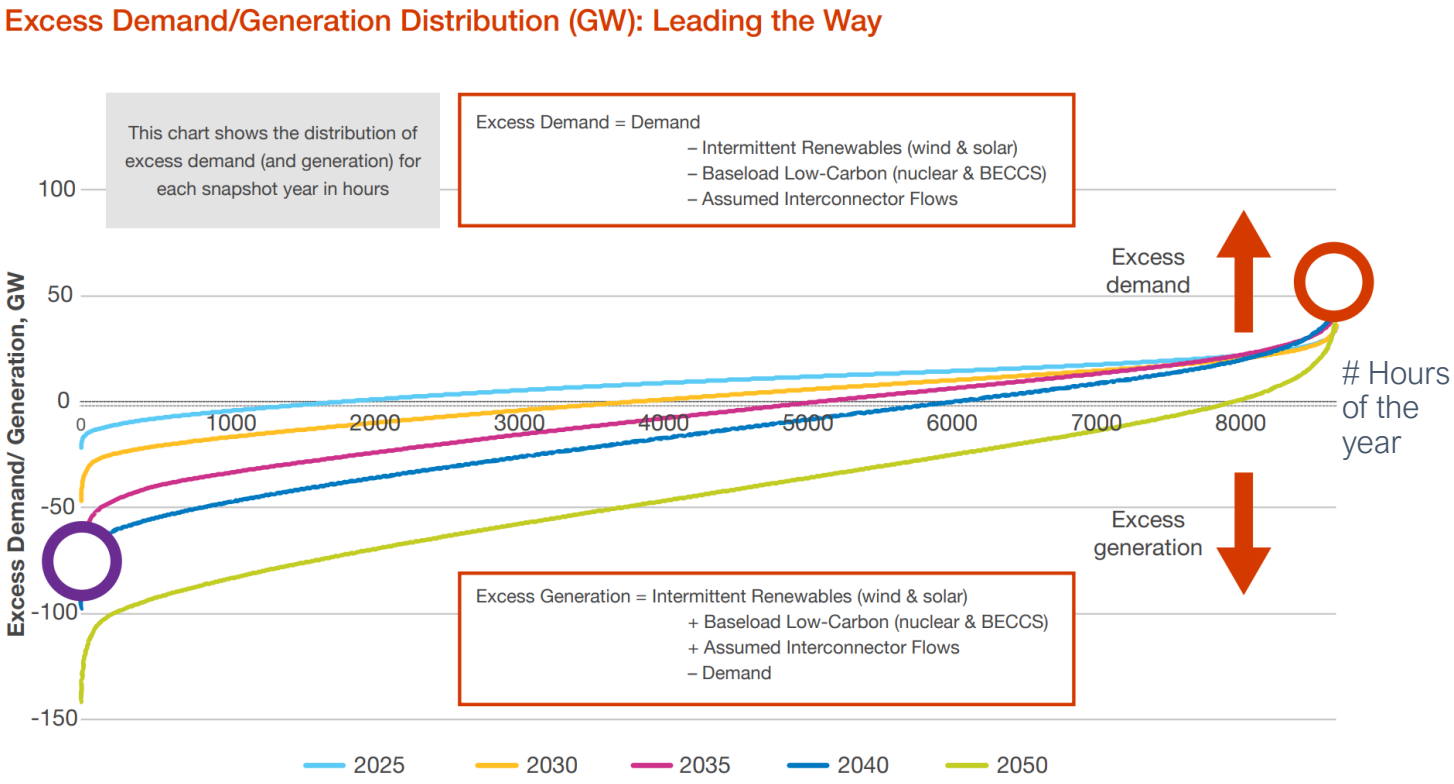
The gap to 2035

Energy over and under supply

By 2035 there could be excess demand in nearly 50% of hours in the year.

Excess demand solutions
- Carbon capture generation
- BECC generation
- Nuclear

Excess demand and generation solutions
- Very long duration storage
- Hydrogen production and generation
- Increased variable demand
- Interconnection



Our Market Reform Strategy

Vision

Transforming markets that enable zero carbon operability from 2025 and will set us on the trajectory for full decarbonisation by 2035

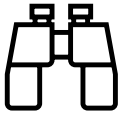
Strategic Framework

SHORT-TERM
We monitor and assess efficiency of existing and new markets, intervening where necessary to protect consumers

MEDIUM-TERM
Our markets roadmap adapts to changing landscape and knits together our short- and long-term strategy

LONG-TERM
Our NZMR programme sets out the long-term vision for markets and policy, as well as achievable pathways to getting there

Strategic Enablers



Horizon scanning

Scanning for longer-term trends; medium-term forecasting and analysis to understand impacts of new markets and reforms on broader markets.

Market Design Framework

A new Market Design Framework has been developed to ensure we are designing markets in a robust, comprehensive and transparent way

Collaboration

Engage stakeholders and MAC via a series of formal channels where we listen to feedback on market efficacy and also present and collaborate on our market developments.

Efficiency analysis

Monitor and assess the efficiency of existing and new markets, intervening where necessary

Our Market Design Framework

Market Design Objectives

Efficient Dispatch

Meets balancing service needs in real time using the optimal combination of supply and/or demand-side resources.

Efficient Investment

Gives investors sufficient certainty over revenues to obtain financing, ensuring future system requirements are met by the right technology mix in the right locations, at lowest cost to society.

Value for Money

Selects outcomes that are in the best interest of current and future consumers.

Market Design Principles

- **Competition (Short-Run)**
- **Competition (Long-Run)**
- **Locational Signals in Dispatch**
- **Locational Signals in Investment**
- **Coherency**
- **Transparency**
- **Investability**

Net Consumer Benefits

- **Practicality**
- **Adaptability**

Short-Term Market Reform

Transparency of requirements

Transparency of auction outcomes and methodologies

Improvements to buy orders used in response and reserve auctions

Acting swiftly to implement solutions to mitigate security of supply risks and maximise balancing cost saving opportunities

Winter contingency contracts – access to over 2GW of capacity

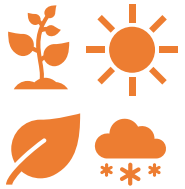
Demand flexibility service – over 1million homes & businesses

Balancing Reserve – up to £900m of consumer value in next 3 years

Medium-Term Market Reform

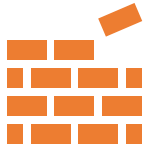
RIIO-2 BP1 workplan included an ambitious suite of reforms to our services and digital infrastructure

Roadmap Regularly Published

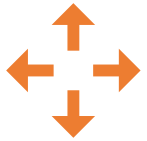


Annual Cycle Process being implemented

Show and Listens Used



Co-creation with industry



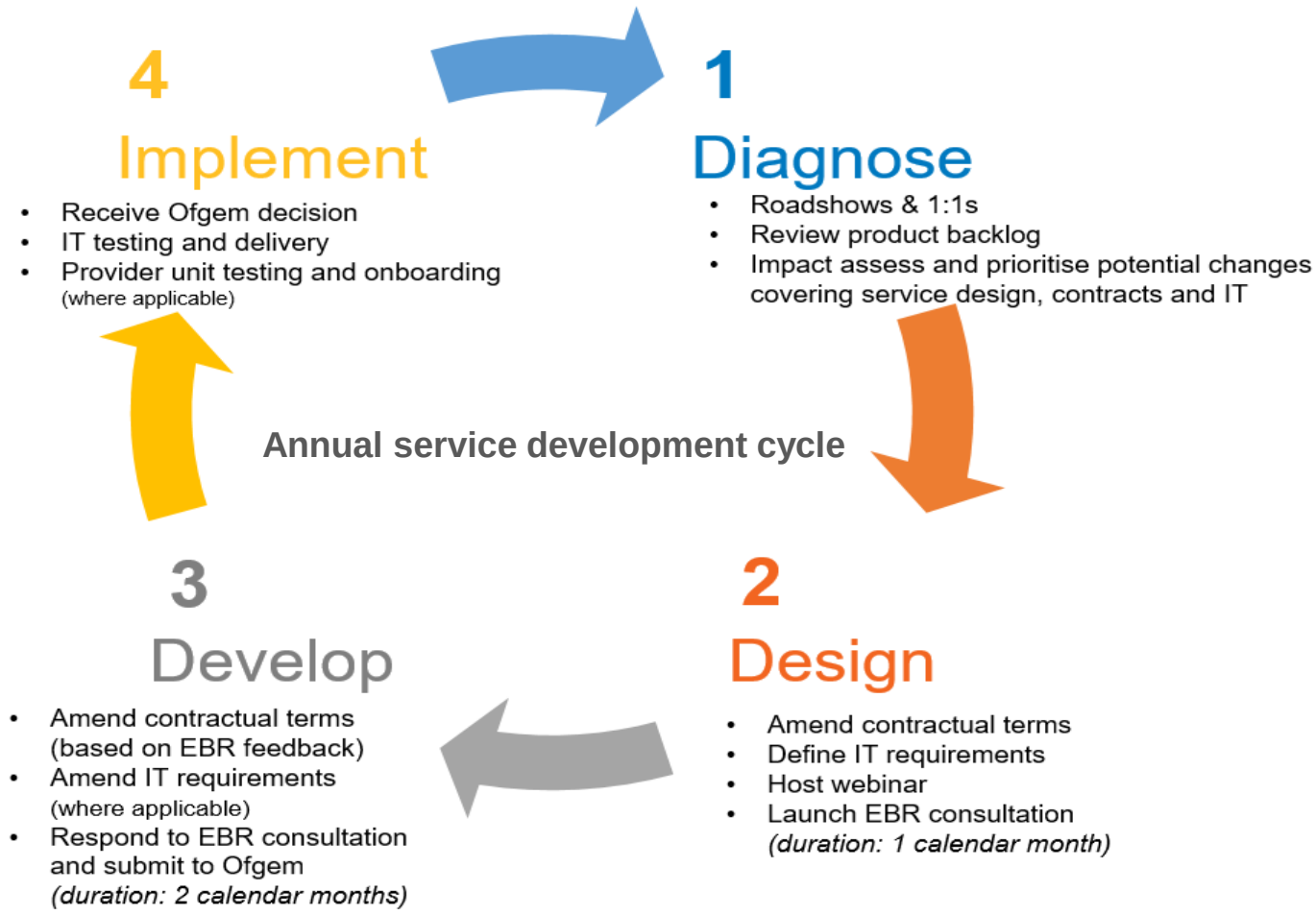
Agile methodology applied

Analysis to support decisions

Delivery of high quality services/platforms that meet customer needs and deliver value to the end consumer

Medium-Term Market Reform

Frequency Response Annual process



Medium-Term Market Reform

Reserve Reform

‘This decision to delay reserve has been taken in light of the significant changes that would have been required in our existing, legacy balancing systems and processes, given the complexity of the new service designs. In the midst of a complex and rapidly evolving systems change environment, we believe it is more prudent to re-evaluate these changes to consider if implementation into our legacy systems is still appropriate, as opposed to direct implementation into our Open Balancing Platform (OBP).

Postponing the rollout of our new Reserve services grants us the opportunity to re-examine our proposed service designs, evaluate our IT options, and collaborate with you more effectively. This will ensure that the best solutions are delivered and that the necessary updates to our balancing systems are apt for enhancing our operational toolkit and are better aligned with the implementation of our future systems. ’

Key strategic objectives and case for change

ESO Mission

To drive the transformation to a fully decarbonised electricity system by 2035 which is reliable, affordable and fair for all

ESO ambitions

- Ensuring the electricity system can operate carbon free by 2025
- Driving competition for the benefit of consumers
- Being the net zero employer of choice
- Engaging as a trusted partner
- Being innovative, digital and data driven

RIIO2 BP benefits areas

- Reduced emission
- Flexible technologies
- Situational awareness
- Greater interconnection
- Better inertia management
- Balancing mechanism outage

New Balancing Capabilities

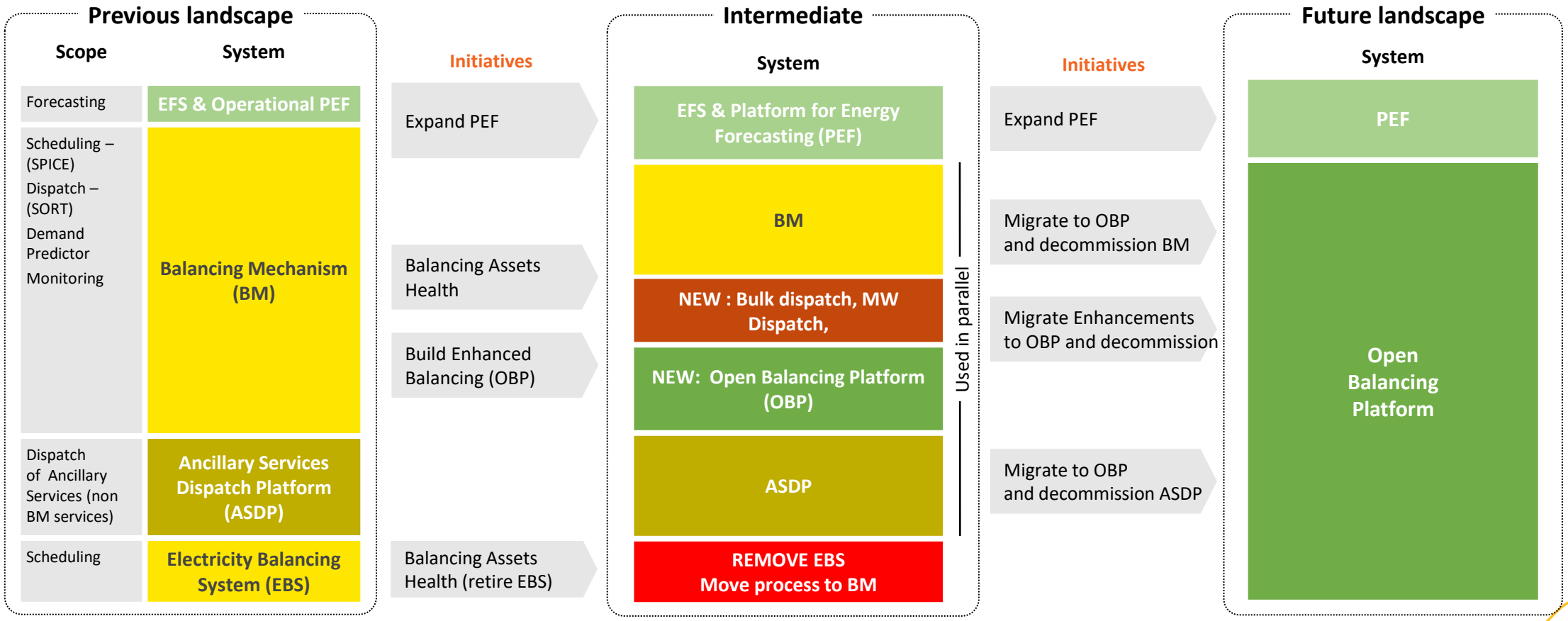
- Automation and decision support tools
- Flexible platform
- Data harmonisation
- Advanced optimisation

Modern, open, reliable, resilient and secure technology platform

What is in scope of the Balancing Transformation Programme?

This investment delivers the Open Balancing Platform (OBP), a new real-time balancing capability to replace legacy ESO balancing systems (EBS, BM and ASDP) and processes and support zero carbon grid operations.

The programme will deliver value incrementally, with an intermediate mode of operation in which enhancements will be first implemented in the current systems, and then integrated in OBP.



Open… to change

Standard **technology**

Well specified **APIs**

Transparent programme **governance**

Configurable ***services***

Observable **system**

Faster deployment of new ***market products***

Balancing… for net zero

Harmonisation

Optimisation

Visualisation

Benefit and risk focused roadmap

User led journeys

All data in one place

Enhanced support tools

Platform… to enable

Set of ***technologies*** *and* ***practices*** *enabling* ***development*** *and* ***operations*** *to deliver* ***faster business value*** *in* ***CNI*** *with* ***security*** *and* ***resilience***

Dispatch Transparency

ESO

What is a “skip rate”?

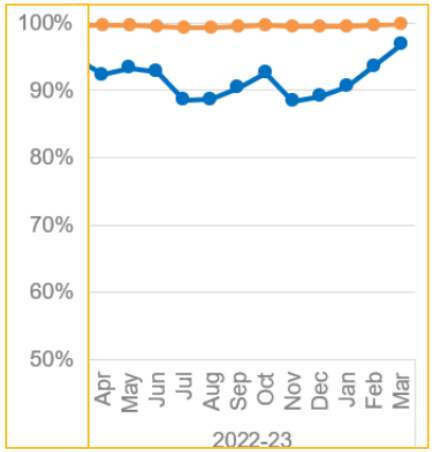
- A skip is a BOA *(*Bid Offer Acceptance) instruction sent by the ESO Control Room to increase or decrease the output of a generator but **at a price that was higher than an alternative option**. The ESO “skipped” an option that appears to be more economic.
- Skip Rate generally refers to **the number of times a skip occurs** in a given period such as a day.

Why worry about skips?

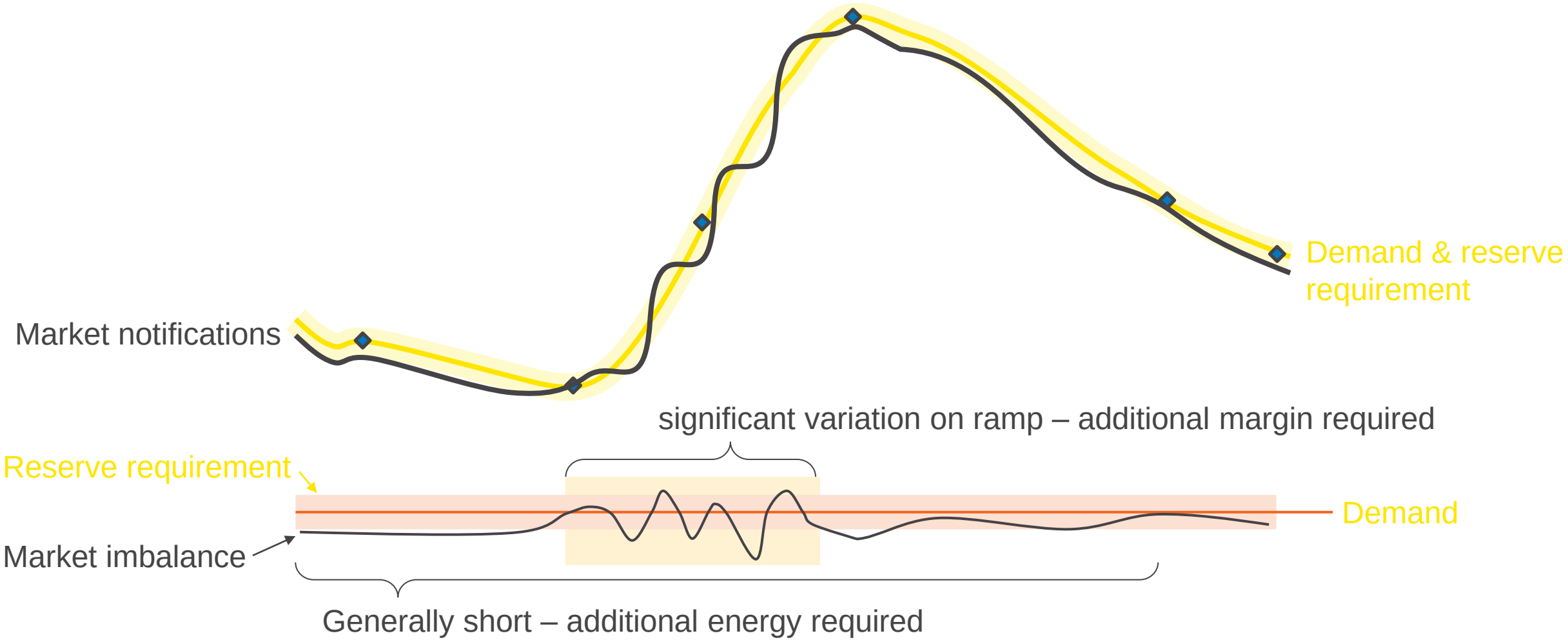
- The ESO has a licence condition to operate efficiently and economically and a target to reduce the balancing cost as much as possible.
- There are genuine skips where alternative instructions could have been sent for a lower cost. However, most actions that appear to be skips in data analysis are taken for operational reasons and are not preventable.
- The ESO strives for zero preventable skips.

Dispatch Transparency

- Actions taken in merit order, or out of merit order due to electrical parameter (category applied)
- Actions that have reason groups allocated (category applied, or reason group applied)
- Actions with no category applied or reason group identified

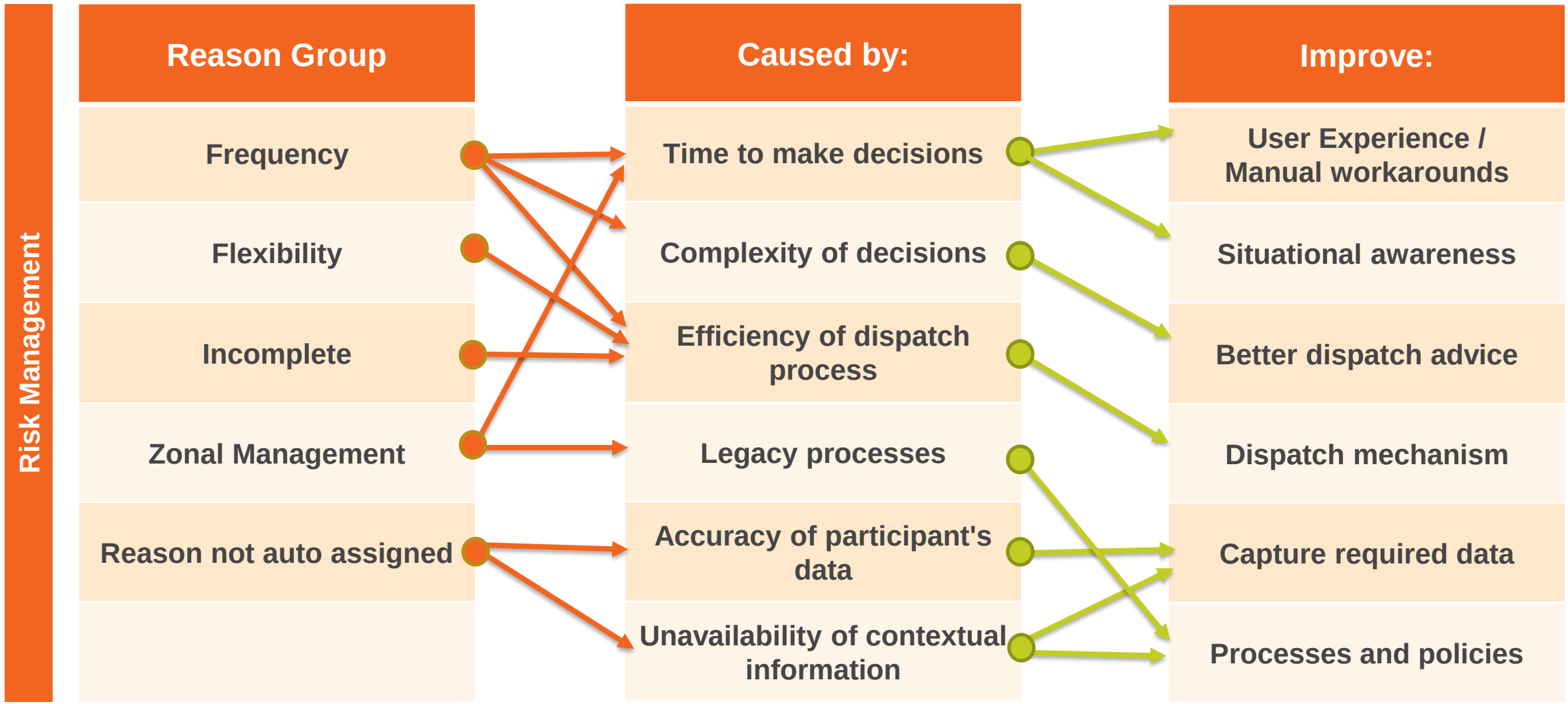


Scheduling – Energy and margin



Dispatch Transparency - Root Cause

Risk Management



Approach to System Changes

Automating & simplifying time consuming, manual processes

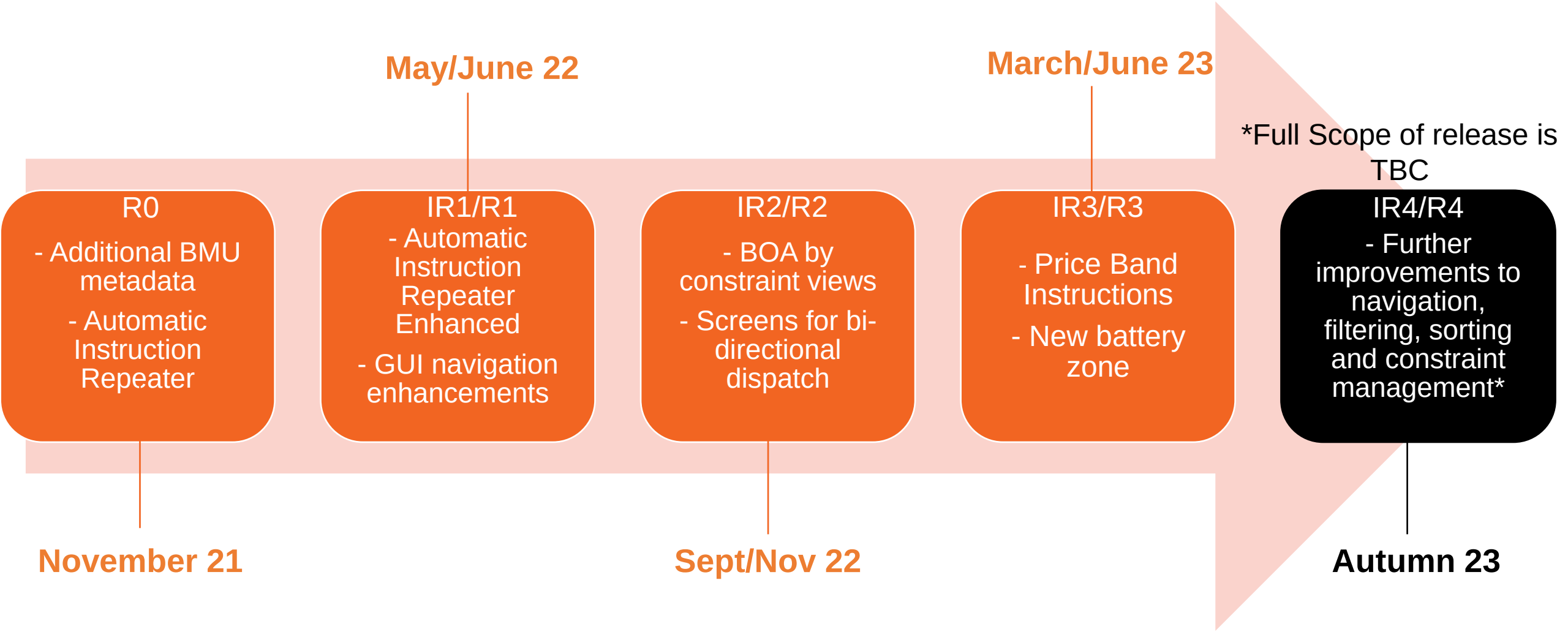
Improving Situational Awareness

Improving dispatch advice

Process Improvements

These changes give users additional time and improved information to facilitate merit order dispatch

Current system developments (related to improved dispatch)



- Delivered
- Future Release

Recent Success: Increased Battery Dispatch

Panel discussion/Q&A

Recap

Aims of today

- Our progress on what we have achieved so far and the benefit it delivers
- How we are transforming the balancing capability of our control room
- A cohesive view of how we are working together to meet our ESO ambitions

- How our transformation will impact you
- Your insight into how we tackle some of the key challenges of transforming our balancing capabilities
- What you would like to see in the future and how we continue to engage

- To understand if our roadmap delivers against your priorities
- Plan how we overcome the challenges on the road to net-zero operability

Thank you

Next Steps

We welcome your feedback

Website updates

You will be added to our mailing list for future updates

- Reach out via email – **box.balancingprogramme@nationalgrideso.com**

Next event in October (location TBC)