Dispatch Transparency Event

5 December 2022 ESO Wokingham

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Dispatch Transparency Event
Cathy Fraser

Systems, Support and Insight Manager

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Housekeeping

Red Lanyards – Visitors

Toilets

Fire alarms/evacuation

Phones

Refreshments

Q & A – Sli.do code #ESODispatch

Please visit **www.sli.do** and enter the code **#ESODispatch** to ask questions throughout the event.

We will answer as many questions as possible in the two Q&A sessions – one after lunch, one at the end of the day. We may have to take some questions away in order to consult our expert colleagues. Answers to these questions will be provided at a future time.

We are intending to publish the Q & A from this event on the ESO Data Portal. If you would prefer your question is not published please make this clear in Sli.do

Please raise your hand to ask any clarifying questions verbally as presenters are speaking.

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Agenda

The objective today is to have a transparent discussion about how we currently make dispatch decisions including what skips are, how we share our decision making, and to share our plans for the future of dispatch

Arrival and refreshments		from 09:30
Welcome and introduction	Cathy Fraser	10:00 – 10:10
How the ESO currently dispatch	Jean Hamman	10:10 – 11:15
Break		11:15 – 11:30
The future of dispatch	Bernie Dolan	11:30 – 12:00
Lunch and optional control room viewing		12:00 – 13:00
Q & A from morning sessions	Cathy Fraser	13:00 – 13:30
ESO Dispatch Transparency methodology	Will Ramsay	13:30 – 14:00
Further Q & A from the event	Cathy Fraser	14:00 – 14:25
Close and departures	Cathy Fraser	14:25 – 14:30

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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 refers to **the number of times a skip occurs** in a given period such as a day.

Why are they of concern?

- 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.

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How the ESO dispatches
Jean Hamman

Operational Manager

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How the ESO dispatches

PLEASE NOTE this session was interactive using a whiteboard to illustrate points and included discussion with attendees. No slides were used, therefore no content can be shared.

Content included:

- Illustration of demand forecast across a 48 hour period (previous day and next day)
- Examples of the challenges the ESO Control Engineers face, and the factors which influence their dispatch decisions.
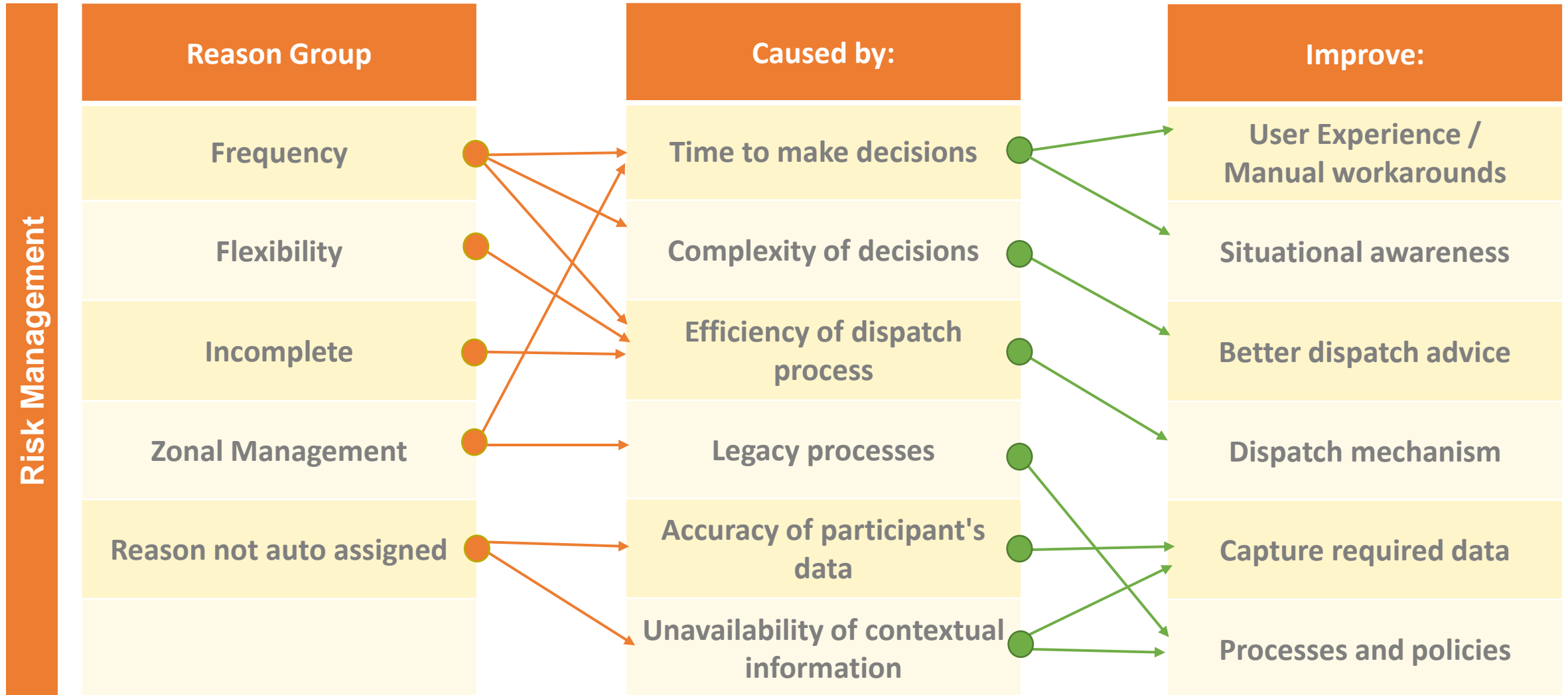- Discussion on specific points raised by attendees

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BREAK

Future of Dispatch
Bernie Dolan

Principal Product Manager

Balancing Transformation

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Skips - Root Cause

Risk Management

Reason Group
- Frequency
- Flexibility
- Incomplete
- Zonal Management
- Reason not auto assigned

Caused by:
- Time to make decisions
- Complexity of decisions
- Efficiency of dispatch process
- Legacy processes
- Accuracy of participant's data
- Unavailability of contextual information

Improve:
- User Experience / Manual workarounds
- Situational awareness
- Better dispatch advice
- Dispatch mechanism
- Capture required data
- Processes and policies

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Incremental changes to reduce skip rates

Improve:
User Experience / Manual workarounds
Situational awareness
Better dispatch advice
Dispatch mechanism
Capture required data
Processes and policies

SORT and SPICE
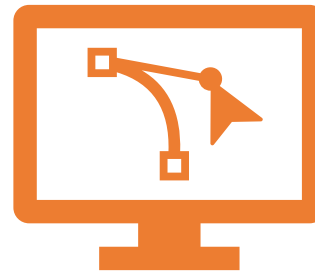
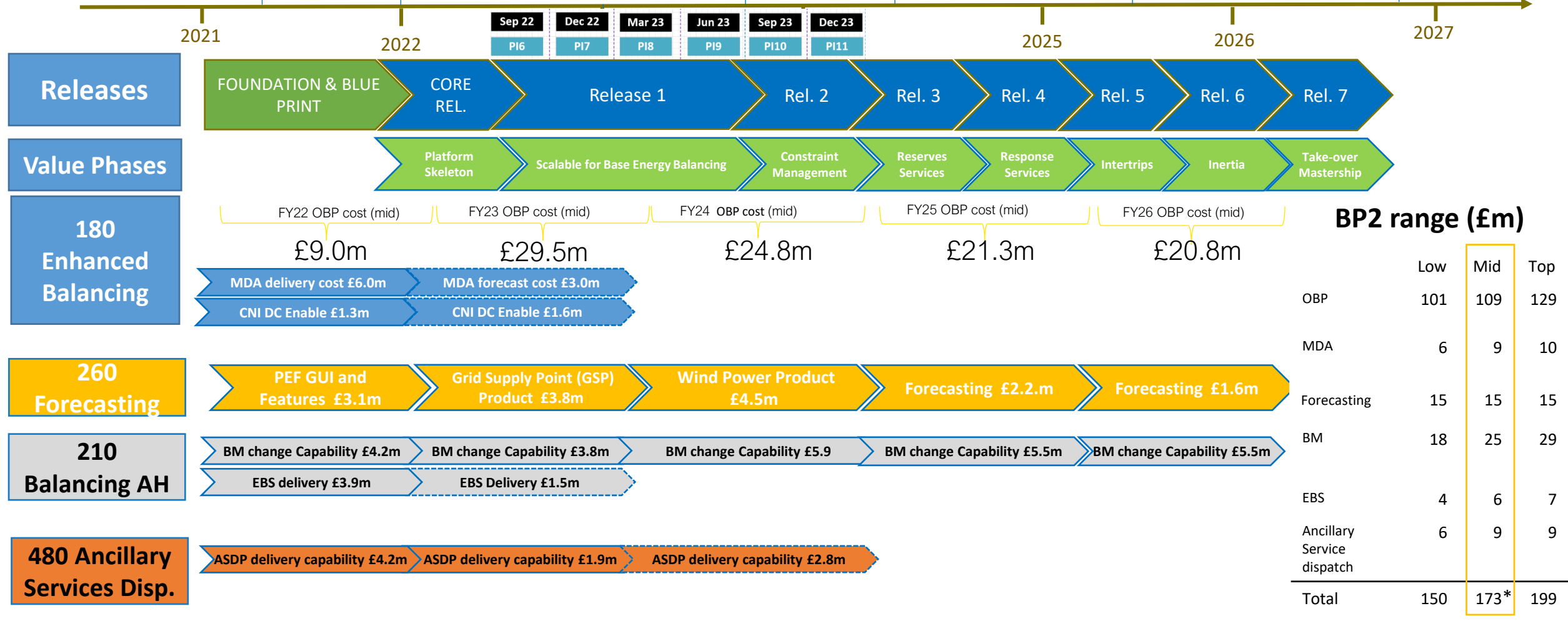**Balancing Platform (OBP)**

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SORT/SPICE Improvements

➢ 4 improvement releases in Balancing Mechanism (BM) in the last 12 months.

➢ 3 more improvement releases in BM planned before summer 2023.

➢ 9,000 hours per year of ENCC time is being saved as a result of removed workarounds and 4,000 more to come after the November BM release.

➢ Automatic Instruction Repeater (AIR) has been implemented; 80% reduction in ZBE workload during busy times.

➢ 40% estimated performance improvement of EDL and EDT as a result of system improvements.

➢ Implemented Power Available 2, resulting in better use of wind power for response.

➢ Changes to dispatch algorithm (Flex Flag) allowing better use of small BMUs.

➢ Improvements to dispatch advice handle more efficiently the situations when level of power generation is away from PN.

➢ Improved situational awareness and user experience achieved by various incremental usability changes across systems.

➢ Changes to metering visibility of IEMS overrides resulting in better quality of data and improved situational awareness.

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Transformation Roadmap Totex Ranges Overview

Programme Milestones

Strategy complete	Base Tooling Ready	Application Skeleton	CNI Ready for OBP testing	OBP in use	EBS Decommission	ASDP Decommission	BM Decommission

2021 2022 | Sep 22 | Dec 22 | Mar 23 | Jun 23 | Sep 23 | Dec 23 | 2025 2026 2027

| PI6 | PI7 | PI8 | PI9 | PI10 | PI11 |

Releases

FOUNDATION & BLUE PRINT | CORE REL. | Release 1 | Rel. 2 | Rel. 3 | Rel. 4 | Rel. 5 | Rel. 6 | Rel. 7

Value Phases

Platform Skeleton | Scalable for Base Energy Balancing | Constraint Management | Reserves Services | Response Services | Intertrips | Inertia | Take-over Mastership

180 Enhanced Balancing

FY22 OBP cost (mid) £9.0m | FY23 OBP cost (mid) £29.5m | FY24 OBP cost (mid) £24.8m | FY25 OBP cost (mid) £21.3m | FY26 OBP cost (mid) £20.8m

MDA delivery cost £6.0m | MDA forecast cost £3.0m
CNI DC Enable £1.3m | CNI DC Enable £1.6m

260 Forecasting

PEF GUI and Features £3.1m | Grid Supply Point (GSP) Product £3.8m | Wind Power Product £4.5m | Forecasting £2.2.m | Forecasting £1.6m

210 Balancing AH

BM change Capability £4.2m | BM change Capability £3.8m | BM change Capability £5.9 | BM change Capability £5.5m | BM change Capability £5.5m
EBS delivery £3.9m | EBS Delivery £1.5m

480 Ancillary Services Disp.

ASDP delivery capability £4.2m | ASDP delivery capability £1.9m | ASDP delivery capability £2.8m

BP2 range (£m)

	Low	Mid	Top
OBP	101	109	129
MDA	6	9	10
Forecasting	15	15	15
BM	18	25	29
EBS	4	6	7
Ancillary Service dispatch	6	9	9
Total	150	173*	199

*Estimated cost for 18 May industry workshop at £164m, which excluded Modern Dispatch Analyser and CNI Data Centres.
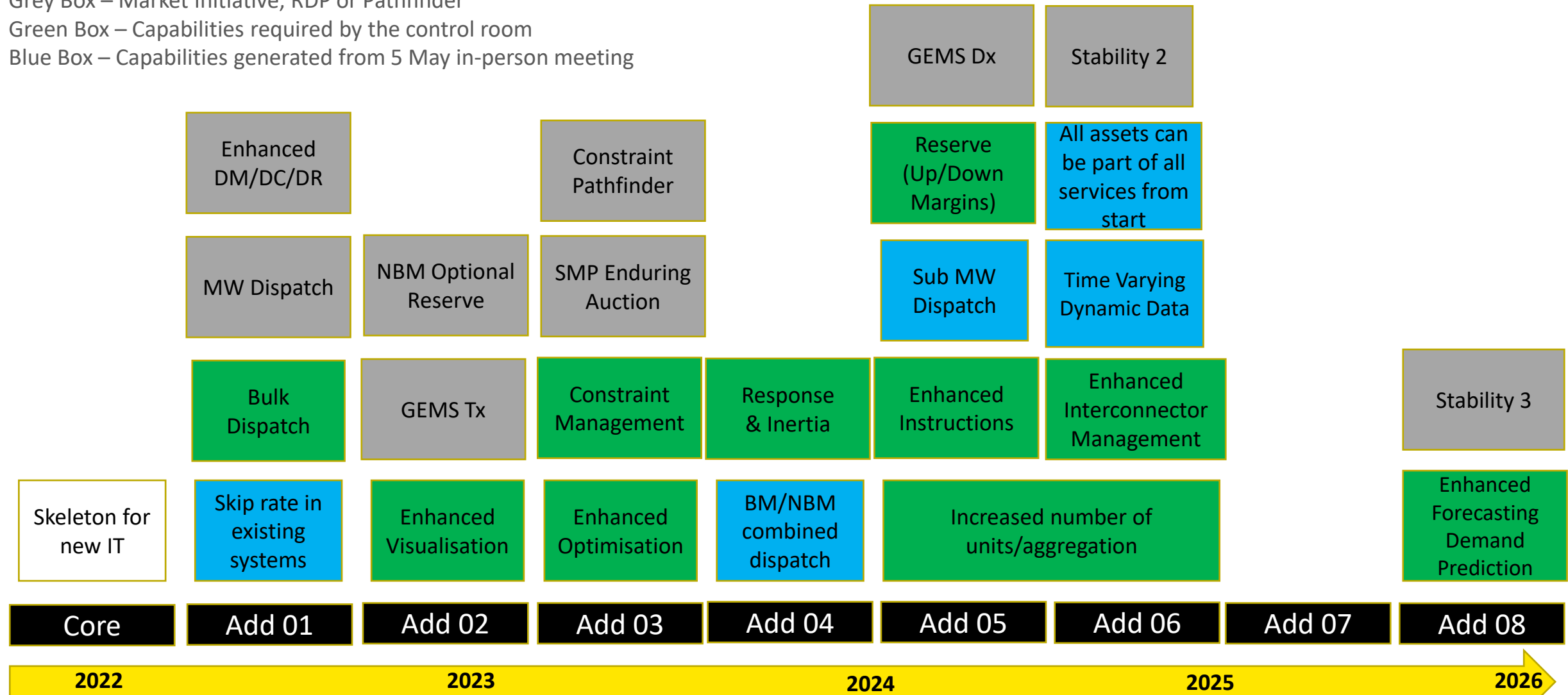
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Industry Co-created Roadmap

Sli.do code #ESODispatch

Key:
Grey Box – Market Initiative, RDP or Pathfinder
Green Box – Capabilities required by the control room
Blue Box – Capabilities generated from 5 May in-person meeting

| | GEMS Dx | Stability 2 |

| Enhanced DM/DC/DR | | Constraint Pathfinder | | Reserve (Up/Down Margins) | All assets can be part of all services from start |

| MW Dispatch | NBM Optional Reserve | SMP Enduring Auction | | Sub MW Dispatch | Time Varying Dynamic Data |

| Bulk Dispatch | GEMS Tx | Constraint Management | Response & Inertia | Enhanced Instructions | Enhanced Interconnector Management | | Stability 3 |

| Skeleton for new IT | Skip rate in existing systems | Enhanced Visualisation | Enhanced Optimisation | BM/NBM combined dispatch | Increased number of units/aggregation | | Enhanced Forecasting Demand Prediction |

| Core | Add 01 | Add 02 | Add 03 | Add 04 | Add 05 | Add 06 | Add 07 | Add 08 |

2022   **2023**   **2024**   **2025**   **2026**

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Open Balancing Platform – Release 1.0 Bulk Dispatch

- 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)
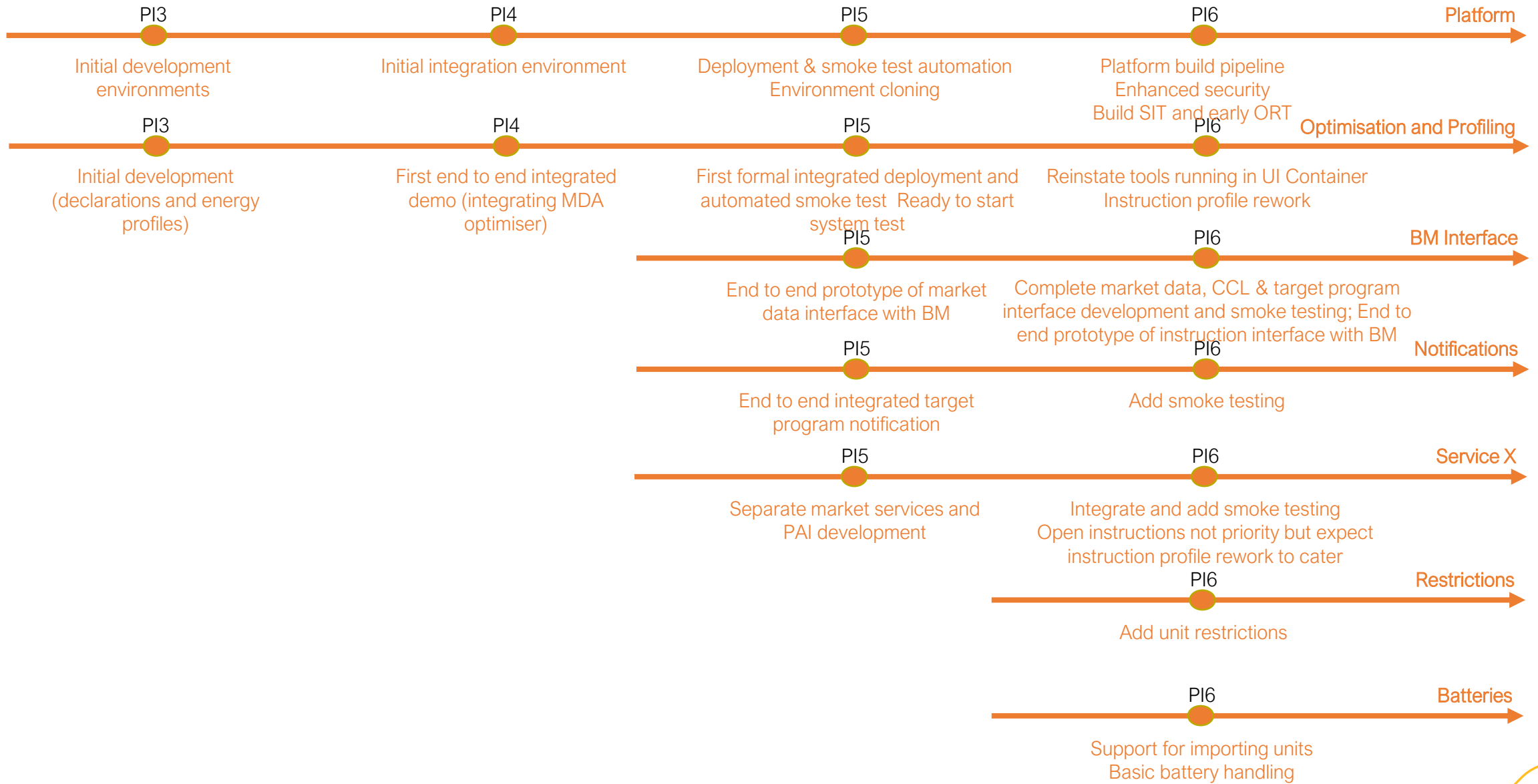
GOAL

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

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Progress at the end of PI5 and targets for PI6

Platform

PI3 — Initial development environments

PI4 — Initial integration environment

PI5 — Deployment & smoke test automation
Environment cloning

PI6 — Platform build pipeline
Enhanced security
Build SIT and early ORT

Optimisation and Profiling

PI3 — Initial development (declarations and energy profiles)

PI4 — First end to end integrated demo (integrating MDA optimiser)

PI5 — First formal integrated deployment and automated smoke test Ready to start system test

PI6 — Reinstate tools running in UI Container
Instruction profile rework

BM Interface

PI5 — End to end prototype of market data interface with BM

PI6 — Complete market data, CCL & target program interface development and smoke testing; End to end prototype of instruction interface with BM

Notifications

PI5 — End to end integrated target program notification

PI6 — Add smoke testing

Service X

PI5 — Separate market services and PAI development

PI6 — Integrate and add smoke testing
Open instructions not priority but expect instruction profile rework to cater

Restrictions

PI6 — Add unit restrictions

Batteries

PI6 — Support for importing units
Basic battery handling

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OBP - After Bulk Dispatch

Enhanced Visualisation

Our new system makes no distinction between BMUs and non-BMUs – all information is viewed together
Control engineers will not have to look in disparate systems for the information they need

Enhanced Optimisation

Our intention is to co-optimise all services in one place
Different services will be "harmonised", then optimised together, then "de-harmonised" for different instruction types
We want to increase transparency and so a key feature of new optimisation tools is to make certain the tool gives reasons for decisions which can be shared

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OBP - After Bulk Dispatch

BM/NBM combined dispatch

All assets can be part of all services from start

OBP will allow services to be dispatched from one tool
This reduction in workload will allow the control room time to execute decisions

Services will be configurable. We intend to implement this as a business rules engine – essentially, we have a "super contract" with different attributes that can be turned on and off
We have already implemented a "service X" to test this
The aim is to reduce the time to get services established and eliminate the need for manual process in initial deployment

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OBP - After Bulk Dispatch

Increased number of units /aggregation

OBP will cater for a larger number of units
The new design moves away from the use of tables etc and presents information in a superior visual fashion
Our current systems are based on the paradigm of units at GSPs – OBP is not

Training Simulators

We will deliver training facilities to help improve the quality of decisions we make
Replaying "difficult days" will help to further improve dispatch decisions
It would also be helpful to allow external parties to come and use these facilities so they can better understand the challenges

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LUNCHTIME

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Control Room viewing

There will be 2 visits: one at 12:00 and one at 12:30

No photography or video recording in the Viewing Gallery

If the Red Light is illuminated at the entrance, DO NOT ENTER the Viewing Gallery. If you are already in the Viewing Gallery please exit as quickly and safely as possible.

Q&A from morning sessions

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ESO Dispatch Transparency Methodology
Will Ramsay

Operational Manager

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Filter Bid-Offer Acceptances
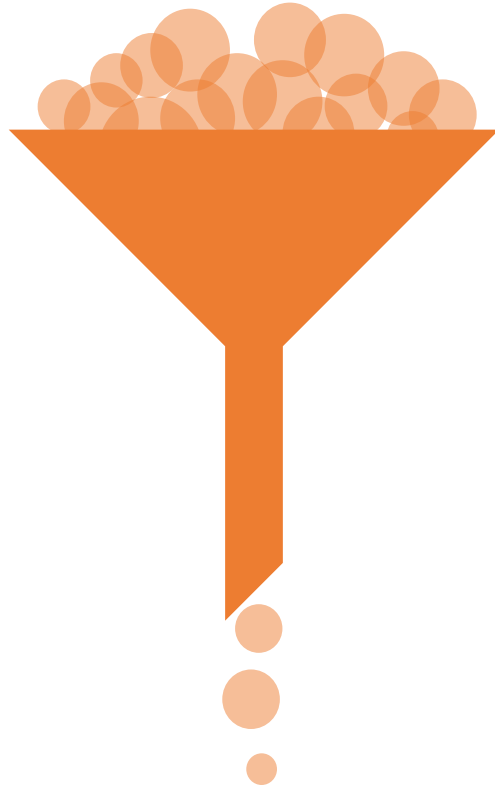
Reasons **for accepting** a bid or offer that appears not to be in merit at the time:

1. System management
Thermal, voltage or stability constraints
Maintain minimum system inertia

2. Frequency response
Repositioning BMU to provide frequency response

3. Unit commitment
In order to gain/maintain access to a BMU at another time, it needs to be/remain synchronised at this time

4. Frequency control
Fast, short burst of energy required to manage a frequency movement

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Filter Bid-Offer Data

Reasons **for not accepting** a bid or offer that appears to be in merit at the time:

1. System management
   Bid/offer would oppose system-flagged offer/bid in same region

2. Frequency response
   BMU armed for frequency response

3. No available volume
   Volume in the stack may not be accessible (MEL, SEL, MIL, deemed bids)

4. Unit commitment
   The requirement at the time of the instruction may not be compatible with
   the dynamic parameters of potential alternatives

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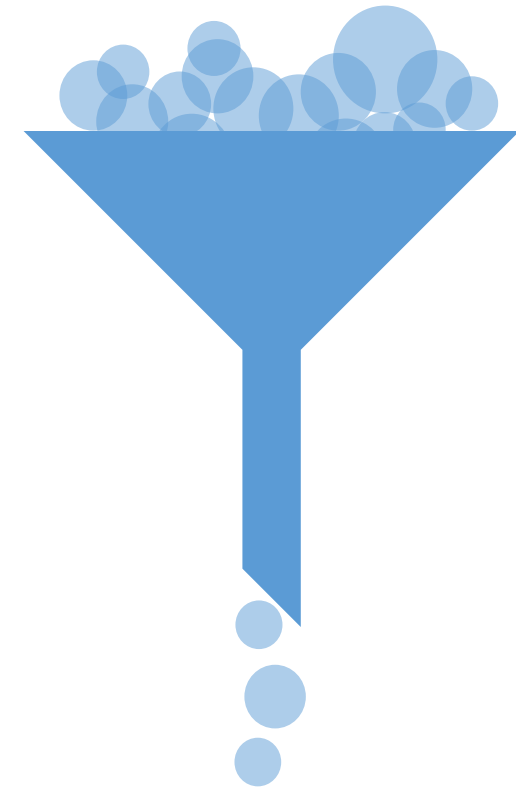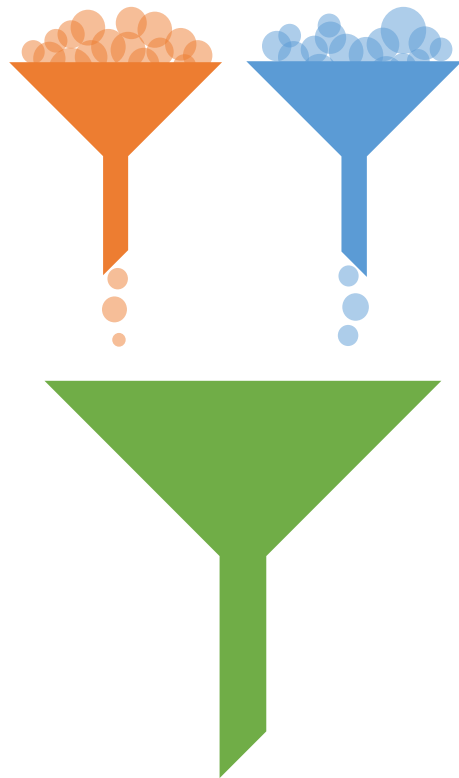
Risk management

Ex-post analysis of actions will struggle to identify risk management actions, which tend to relate to units' dynamic parameters and unit commitment

1. Avoiding sterilising options
- Unit 'A' (£110/MWh) is not strictly required right now
- Allowing unit 'A' to desync will make it unavailable for its MNZT
- There might be a requirement for Unit 'A' and Unit 'B' imminently
- If the need for A+B does not materialise, Unit 'B' (£100/MWh) is not instructed
- Unit 'A' is subsequently allowed to desynchronise

2. Managing flexibility
- In some circumstances, slow/expensive actions may need to be committed early, so that flexible capacity is not exhausted at the moment it is needed
- This works both ways, in the majority of circumstances, slow/expensive actions will be avoided if possible

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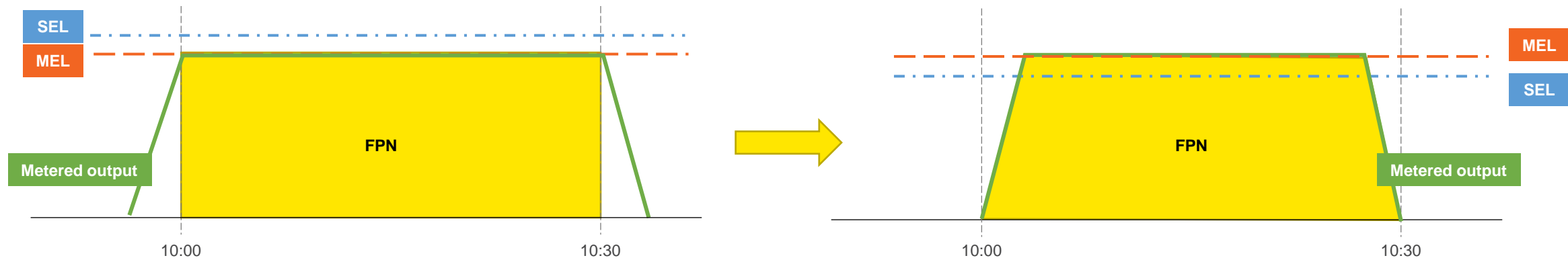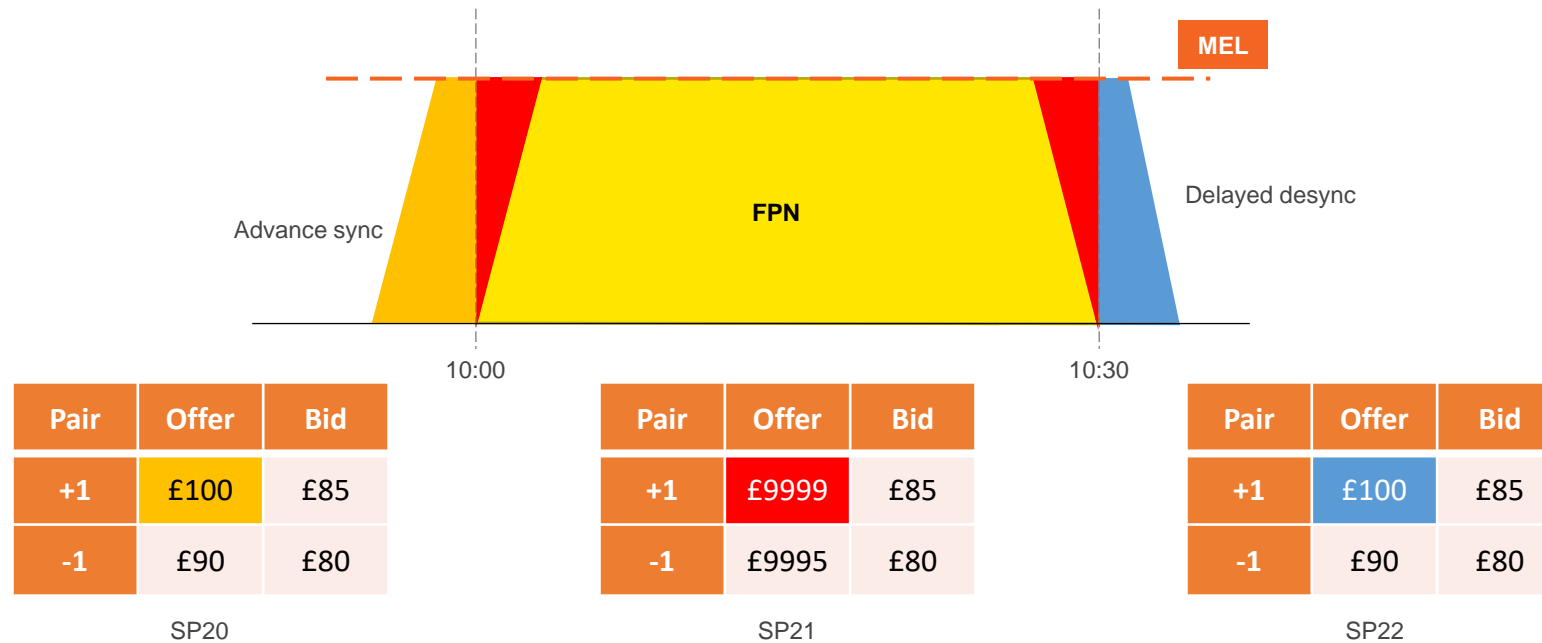
Data examples (1)

1. SEL > MEL

2. Generating without a physical notification

3. PN inconsistent with dynamic run-up and run-down rates

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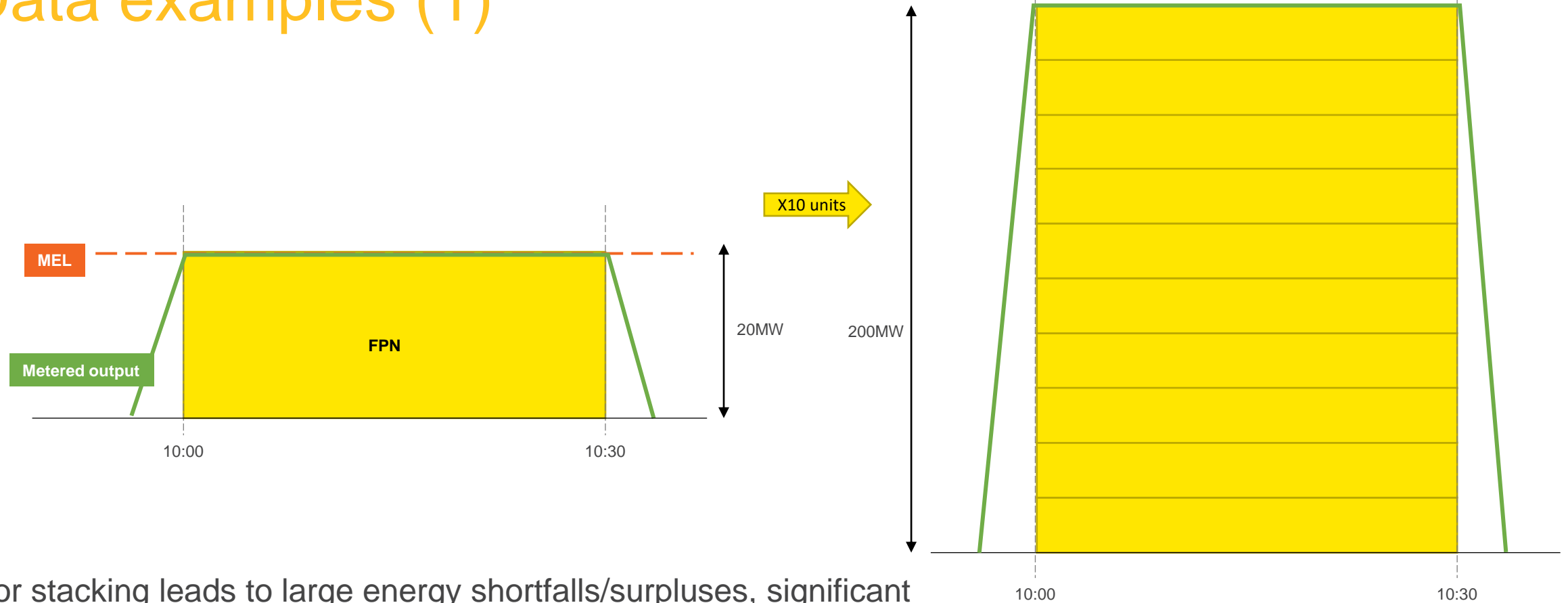
Data examples (1)

Error stacking leads to large energy shortfalls/surpluses, significant frequency variation and results in the need for corrective action

Data examples (2)

Pair	Offer	Bid
+1	£100	£85
-1	£90	£80

SP20

Pair	Offer	Bid
+1	£9999	£85
-1	£9995	£80

SP21

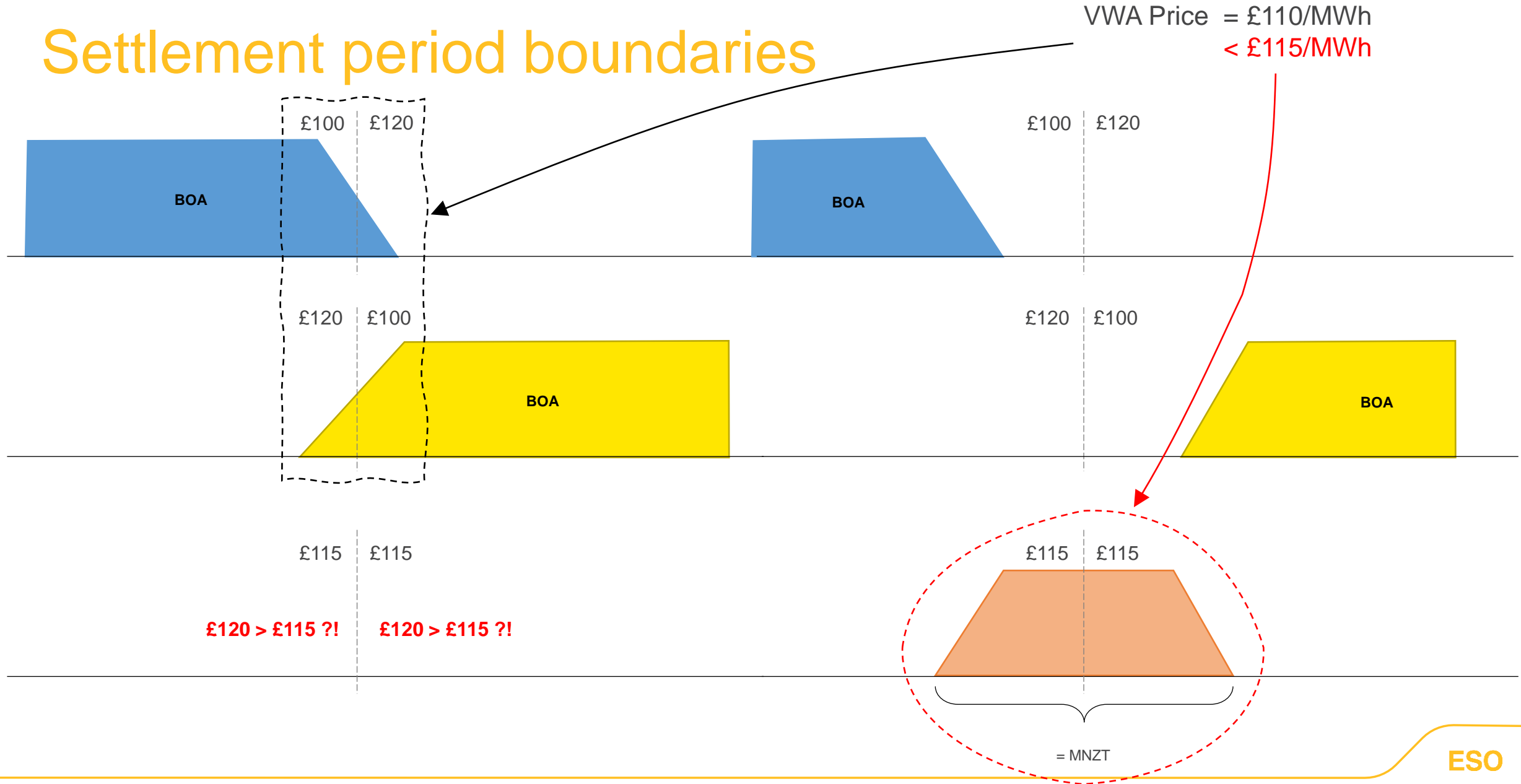| Pair	Offer	Bid
+1	£100	£85
-1	£90	£80

SP22

Offer prices for SP21 make **Advance Sync** and **Delayed Desync** options unviable, despite attractive prices in the adjacent settlement periods

There is no need to use high prices to prevent offer acceptances above MEL.

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Settlement period boundaries

£100 | £120

BOA

£100 | £120

BOA

£120 | £100

BOA

£120 | £100

BOA

£115 | £115

< MNZT

£115 | £115

= MNZT

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Further Q&A from the event

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What happens next?

- We will publish material and Q&A from today on our website and advise you and the OTF where to find them

- We will send you a survey request asking for your feedback on today's event and providing an opportunity to comment on the ESO approach to Dispatch Transparency and suggestions for the changes you would like to see.

- We will use your responses to help inform our work on the continuing efforts to increase transparency and understanding of our dispatch decisions.

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And finally for today

Two questions for you (answers on a post it note as you leave please):

- On a scale of 0 to 10 how likely are you to recommend future ESO Dispatch Transparency events to your colleagues?

- Why?

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Thank you for joining us

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