Reforming dispatch under REMA

REA Update – Friday 05 April 2024

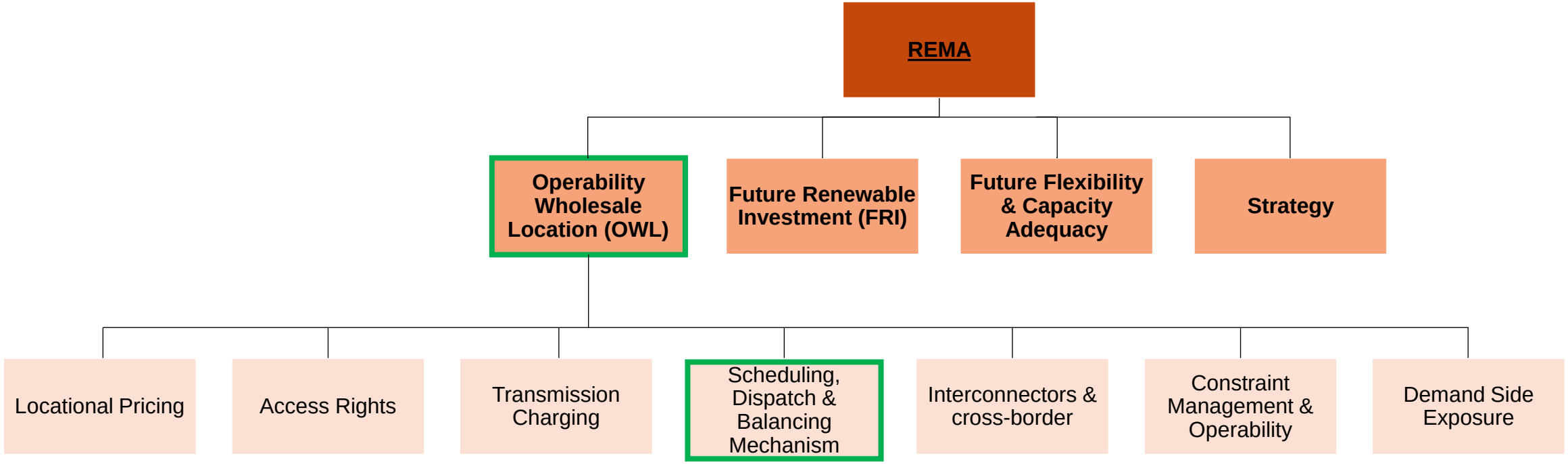
ESO

Contents

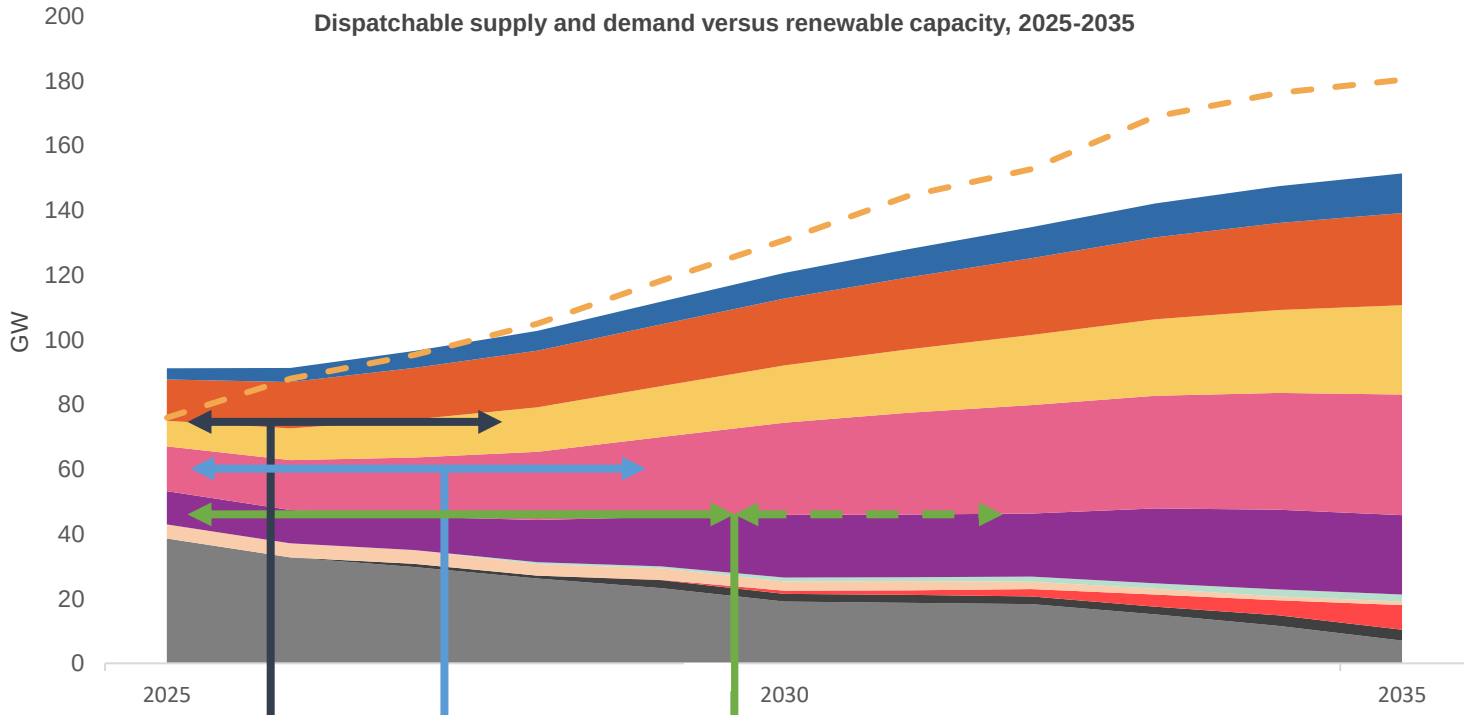
An opportunity for ESO to update members on Scheduling & Dispatch reform being explored through REMA

- Where does scheduling & dispatch fit into REMA and wider ESO activities?
- Scheduling & Dispatch Reform – the case for change
- Beginning to construct options for reforming dispatch arrangements
- Next steps and how we are planning to continue engagement

Where does scheduling and dispatch fit into REMA?



How does this work fit with other ESO programmes?



Key:

- Electrolysis
- DSR
- V2G
- Storage
- Interconnectors
- BECCS
- Biomass
- Hydrogen
- Gas CCUS
- Gas
- Renewables

Wholesale market design and implementation

Wholesale market implementation complete depending on design

Balancing Programme — Development of the Open Balancing Platform

Flexibility Strategy — Low/non regrets reforms to promote the growth of zero carbon flexibility

REMA — Enduring electricity market arrangements to support net zero system in 2035

Systems development

Market Reforms

Note: Year ranges represent illustrative implementation dates

Why are we exploring the Case for Change?

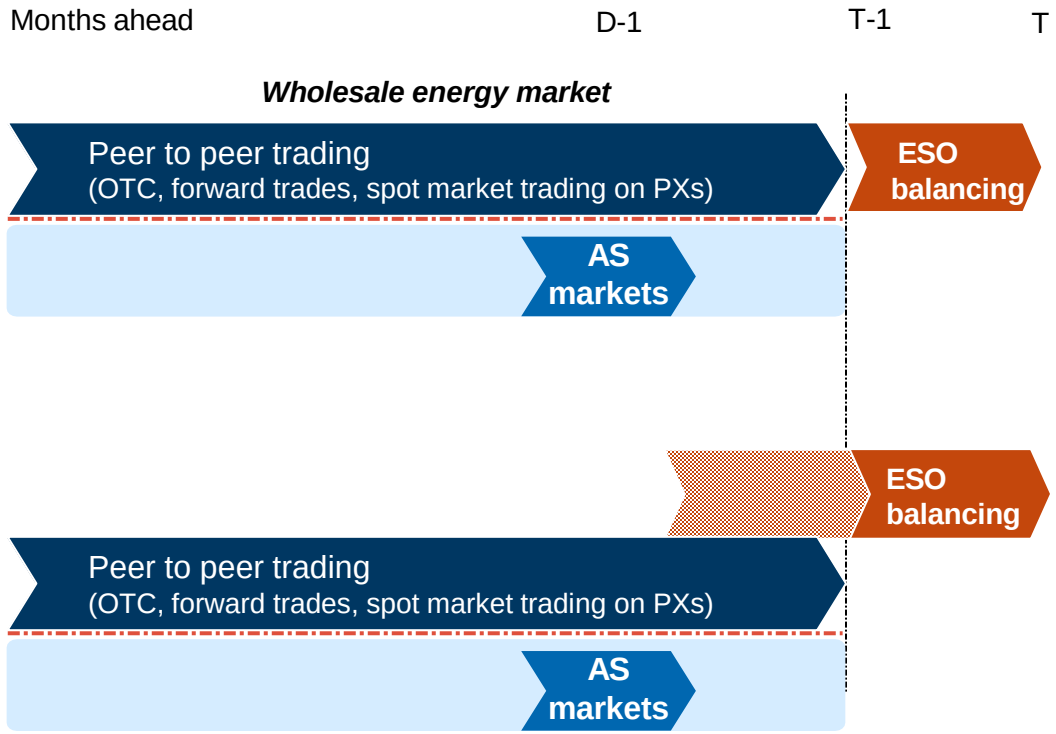
As operating the system becomes more challenging, we are concerned that ESO is becoming a ‘Central Scheduler’, contrary to its intended role

Theoretical GB market design

The GB market was designed assuming the ESO only intervenes at the last minute

De facto GB market operation

As optimising the system becomes harder, ESO is overlapping with the wholesale market, creating confusing price signals



The growing overlap between ESO redispatch and wholesale market trading can create conflicting price signals and impact overall transparency

There is a clear case for change of the ‘status quo’ as the underlying conditions have changed since NETA was introduced

What are the key limitations of the ‘status quo’ scheduling and dispatch regime?

1. **Incentives** — The energy markets do not provide scheduling incentives in line with system needs and operational requirements
2. **Visibility and access** — Incomplete ESO visibility of market outcomes and limited access to some resources impacts coherence between wholesale market and balancing
3. **Intertemporal issues** — The current dispatch mechanism does not facilitate effective optimisation of costs and unit constraints over time

We are taking a bottom up approach to assessing different dispatch options

	Building block	Description
Major building block	Number of GB zones	Number of zones for the GB wholesale market.
	Access regime	Whether access to the transmission network should be firm or not.
	Scheduling structure	Whether units should self-schedule or be centrally scheduled by SO
Self dispatch choices	Wholesale market bidding granularity	Whether units should balance at portfolio level or unit level.
	Wholesale market bidding language	Whether bids are simple or multi-part (currently governed by power exchanges).
	Imbalance price design	Whether there should be single or dual imbalance prices and how sharp the signals should be.
	System Operator visibility	The extent to which SO can see DER and supplier hedged positions.
	Dispatch model design	When balancing actions begin (proactive or reactive) and RT mechanism to enact (cont. or discrete).
	Gate closure design and defining the scope	The length of gate closure which locks in nominated positions and who is required to adhere to gate closure.
Central dispatch choices	Central dispatch optimisation	Whether SO are aiming to minimise deviation from PNs or minimise cost of production.
	Market scheduling process	Whether scheduling is continuous or does it use discrete auctions.
	Bidding language	Whether bids are simple or multi-part.
	Central dispatch capacity calculation	Whether energy load and transmission capacity are co-optimised or not.
	Status of real-time market	Whether real-time market is a gross pool or a net pool.
Secondary design choices	Intraday design	The design for intraday wholesale market (e.g. continuous trading, pooled liquidity).
	Supplementary ancillary service reqs.	Whether certain ancillary services are required for real-time balancing (e.g. expanded BR, constraints).
	Settlement period design	The duration of periods for which participants are settled.
	Information & transparency	The level of information and timing on BM data (pricing, dynamic parameters etc.) that is made public
	Price formation	Whether you have uniform prices or side / top-up payments for units.

Next steps & continued engagement

Case for Change

- On March 12th, we held our first workshop with representatives from several trade bodies and key institutional actors.
- We will **continue to engage throughout spring.** Following the workshops, we will publish AFRY's 'Case for Change' report and conclusions.

Options for Reform

1. **Industry & ESO idea generation:** We welcome organisations sending us their proposals for how the issues raised can best be addressed. In parallel, we are establishing our own view of credible options for dispatch reform and working with DESNZ to package these for modelling.
2. **ESO option sharing:** We plan to run a follow-up workshop outlining the spectrum of options we have identified and asking for additional options to address the issues, **likely in late May**

Other related work

- We have in parallel been assessing the interactions between energy and ancillary service procurement looking at the pros and cons of more co-optimised procurement
- We will be engaging with stakeholders on this project in the coming months

Net Zero Market Reform | ESO (nationalgrideso.com)

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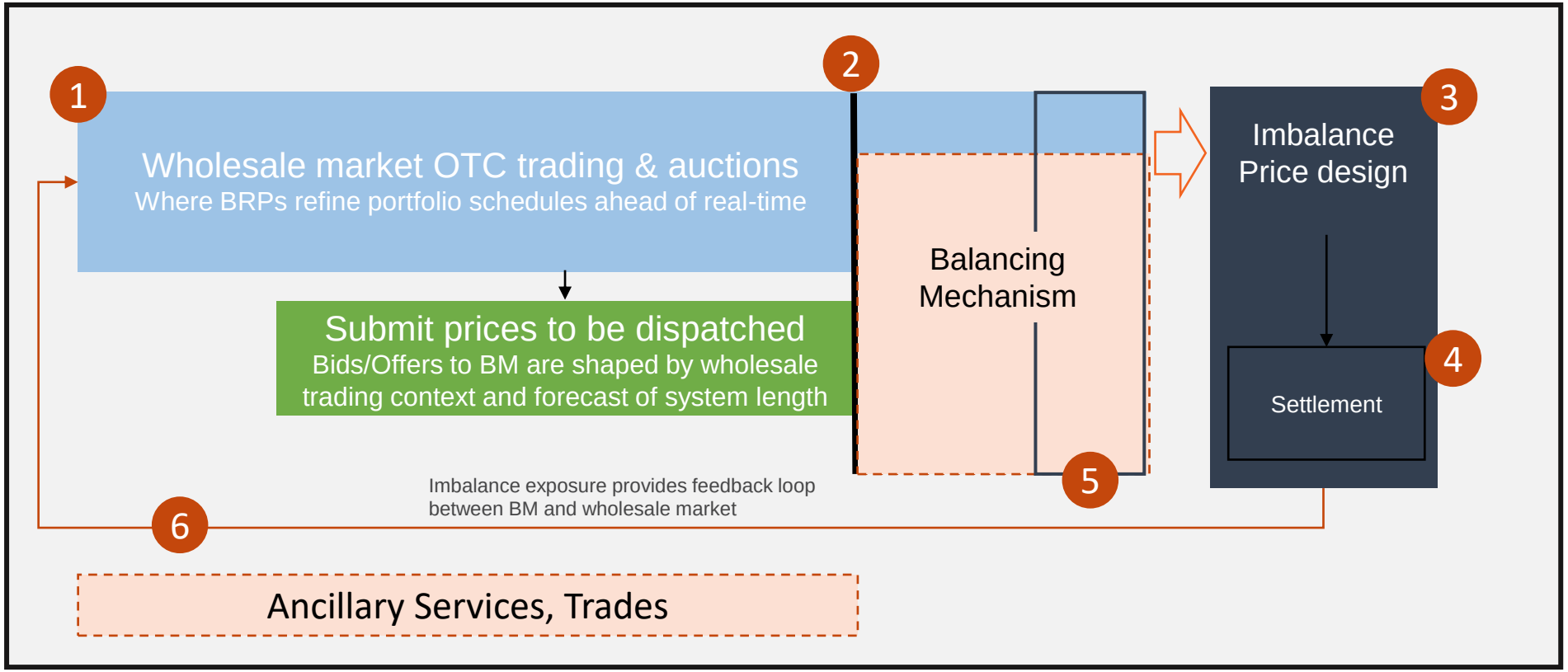
Appendix

Scope of this work

GB Dispatch Design includes multiple interlocking features governed by different parties, and sets ESO up to be a residual balancer

1. Design of spot markets
2. Timing of Gate Closure
3. Balancing Market or Mechanism
4. How is imbalance exposure allocated (i.e profiled or case based settlement)
5. Settlement Period Length
6. Speed of feedback loop



Portfolio owners | Consumers (bills) | SO | Balancing Mechanism Participants

Assessment Framework

Overarching Objective for future Dispatch Mechanism Design:

To facilitate secure operation of a net zero electricity system and drive value for consumers

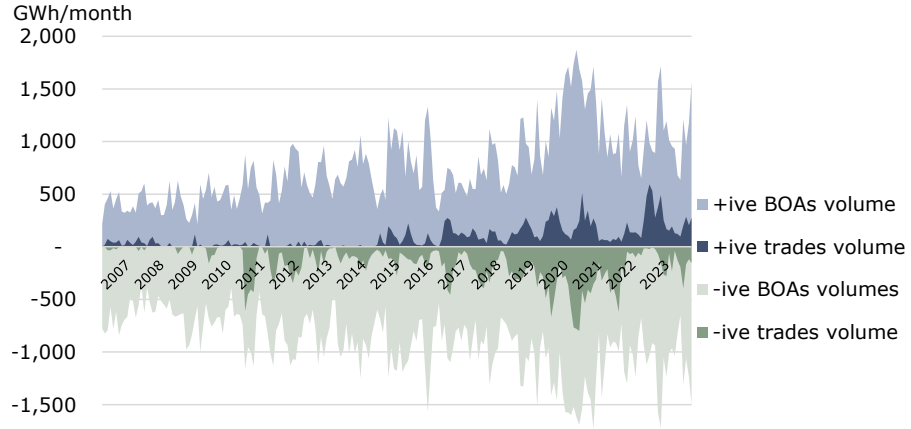
A lot has changed since the introduction of NETA

ESO is increasingly acting as a central scheduler in a market environment designed for a residual balancer

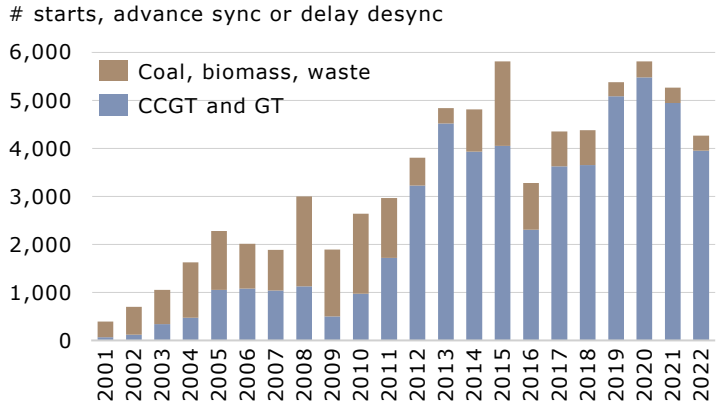
While the need for balancing actions grows, ESO faces an increasing level of uncertainty and variability, compounding the difficulty and the potential for inefficient decisions

There is a greater need for forward-looking decisions, and the BM was not designed to optimise over multiple timeframes or to deliver transparent forward-looking prices

MONTHLY BALANCING VOLUMES (BOAS AND TRADES), 2006-2023



NUMBER OF UNIT COMMITMENT DECISIONS THROUGH THE BM, 2001-2022



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In addition to network capacity challenges, the limitations of the current market design challenge system operation and can result in inefficient dispatch

		Reason for ESO actions			
		Energy balance	Network congestion	Reserve	Other system needs
Limitations of the current market design and processes	**Incentives**: The energy markets do not provide scheduling incentives in line with system needs and operational requirements				
	Visibility and access: Incomplete ESO visibility of market outcomes and limited access to some resources impacts coherence between wholesale market and balancing				
	Intertemporal issues: The current dispatch mechanism does not facilitate effective optimisation of costs and unit constraints over time				

While each aspect is potentially manageable individually, the combination of the three creates the current limitations of the scheduling and dispatch processes

Solving the underlying reasons for ESO action is another way to limit potential difficulties

AFRY

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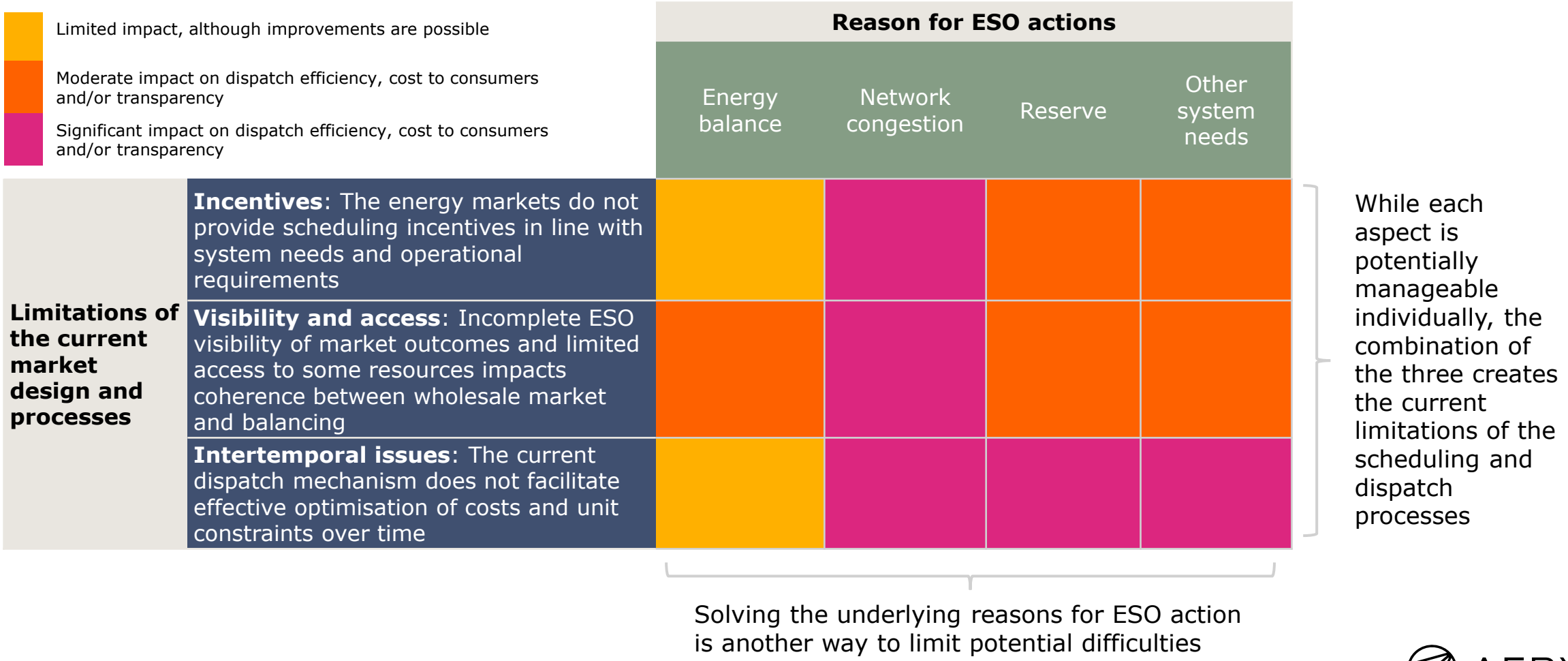

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What is less clear is what to change to …

There are two high-level approaches:

Giving market participants **better incentives** and better information to support system operation

This may include some or all of the following:

- shorter imbalance settlement intervals
- smaller zone size
- improved signals for ancillary services
- improved information sharing between market participants and ESO

Formalise ESO de facto role by giving **greater control earlier**

Effectively allowing ESO to coordinate unit commitment decisions and operation of energy-limited units, as well as within-day positions

Ongoing changes are expected to mitigate some specific manifestations of the issues

Recent or planned changes potentially mitigating identified issues

Incentives

- **Ongoing network capacity expansion**
- **Balancing Reserve will pre-contract some resources to provide reserve availability**
- **Half-hourly settlement**
- **Ofgem compliance engagement with storage regarding TCLC**

Visibility and access

- **GC117 proposal to reduce BMU threshold to 10MW**
- **Local constraint market (pilot for B6) will allow ESO access to more resources**

Intertemporal issues

- **Balancing reserve will reduce the need for pro-active scheduling actions in the BM**
- **Potential submission of data on energy limited units (within Gate Closure only)**
- **Ofgem inflexible offers licence condition**

INCENTIVES

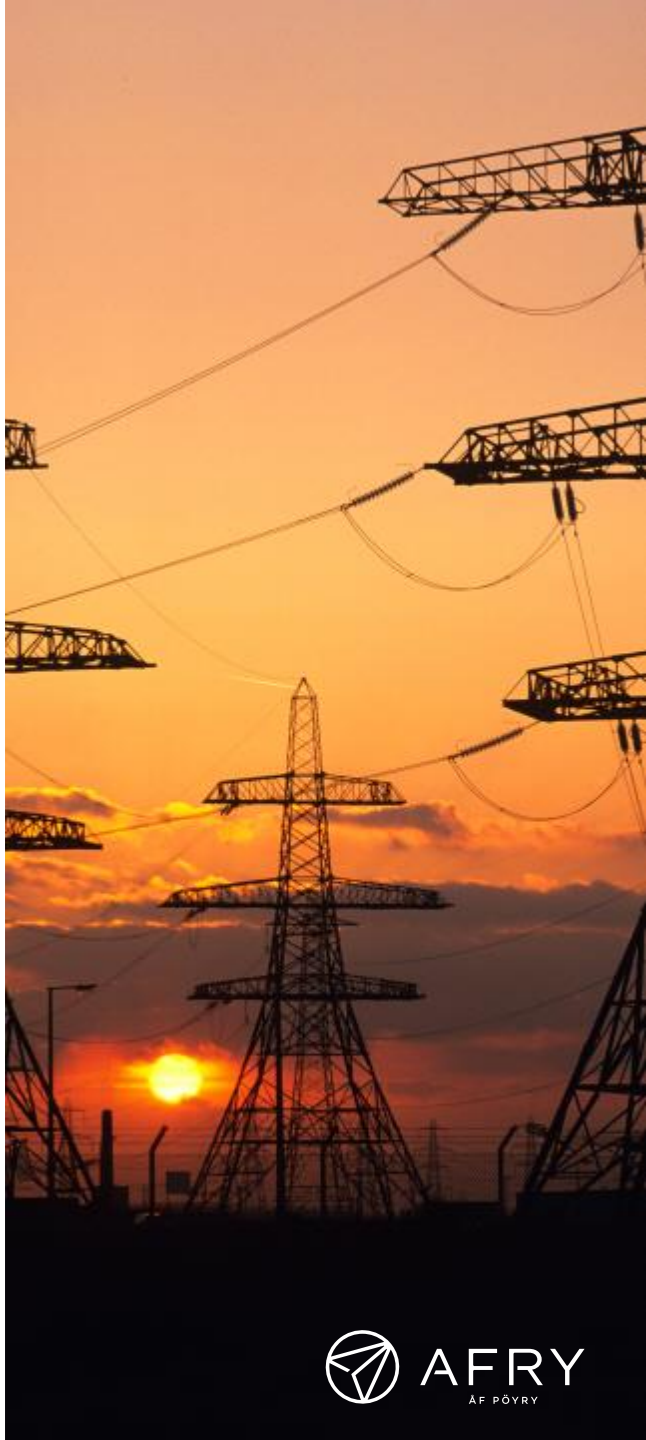
Energy markets don’t provide scheduling incentives in line with system needs and operational requirements

1. **‘Unconstrained’ market incentives:** Incentive provided by national Imbalance Price does not align with network constraints and other system needs
2. **‘National’ imbalance price:** Portfolio level balancing and national Imbalance Price lead to dispatch/NIV chasing in ‘wrong’ location
3. **Potential missing signals for real time reserve procurement:** Market is not incentivised to provide reserve capacity where and when needed

VISIBILITY AND ACCESS

Incomplete ESO visibility of market outcomes and limited access to some resources impacts coherence between wholesale market and balancing

1. **Incomplete coverage:** Coverage of FPNs is incomplete, particularly for the growing share of flexible non-BM resources, meaning ESO has limited visibility of full market schedules when doing contingency planning
2. **Inaccurate information:** Schedules change significantly before gate closure meaning ESO decisions are taken with inaccurate information
3. **Behaviour:** Uncertainty on the expected level of system support for balancing by flexible non-BM resources (e.g. NIV chasing or response to retail tariffs)
4. **ESO access to resources:** Key resources respond to wholesale market signals but are not dispatchable by ESO in balancing timeframes
5. **Coordination:** Sequential procurement of balancing services adds uncertainty to decision making for both ESO and market participants



INTERTEMPORAL ISSUES

The current dispatch mechanism does not facilitate effective optimisation of costs and unit constraints over time

1. **Timing:** ESO is obliged to take proactive decisions with consequences for future periods beyond Gate Closure, which overlaps with the operation of the intraday market
2. **Information:** ESO takes decisions with inter-temporal consequences based on imperfect and incomplete forward-looking data
3. **Transparency:** Beyond-the-wall protocols and advance commitments cloud transparency and may distort imbalance pricing