Scheduling and Dispatch Options Webinar

Wednesday 17 July 2024

ESO

Agenda

Item			Time
Welcome		Lizzie Blaxland (ESO)	13:00 – 13:05
DESNZ Intro		Harry Mayhew (DESNZ)	13:05 – 13:15
ESO Intro		Izzie Sunnucks (ESO)	13:15 – 13:25
Reminder of the case for change		Dan Taylor (ESO)	13:25 – 13:35
Introduction to key concepts	*Overview of scheduling & dispatch and dispatch philosophies*	Rob Westmancoat (ESO)	13:35 – 13:50
Process for establishing options	*Building blocks, counterfactual*	Ed Farley (ESO)	13:50 – 14:05
Introducing strawman models			14:05 – 14:10
Coffee Break			14:10 – 14:20
Model 1: Self-scheduling	*Presentation & quick clarification questions*	Rob Westmancoat (ESO)	14:20 – 14:45
	Breakout 1		14:45 – 14:55
Coffee Break			14:55 – 15:05
Model 2: Hybrid scheduling	*Presentation & quick clarification questions*	Izzie Sunnucks (ESO)	15:05 – 15:20
	Breakout 2		15:20 – 15:30
Model 3: Central scheduling	*Presentation & quick clarification questions*	Francisco Celis Andrade (ESO)	15:30 – 15:45
	Breakout 3		15:45 – 15:55
Coffee Break			15:55 – 16:00
Summary			16:00 – 16:05
Q&A			16:05 – 16:30

Housekeeping

1. The main meeting will be recorded and published online.
2. Breakout groups will not be recorded. But each group will have a scribe making notes of relevant feedback.
3. We encourage people to turn on their cameras when in breakouts.
4. These notes will operate under Chatham House Rules.
5. Q&A
   - Please ask all your questions via the Q&A functionality in the Teams Webinar.
   - **No more than 4 questions** per organisation to ensure diverse views
   - No anonymous questions.
   - We will answer as many questions as possible today. Some questions might need to be answered later via a publication in our website.

Today's speakers

ESO

Lizzie Blaxland
Head of REMA Market Design

Isabel Sunnucks
Dispatch & Balancing Manager

Francisco Celis Andrade
Market Strategy Lead

Rob Westmancoat
Senior Market Strategy Lead

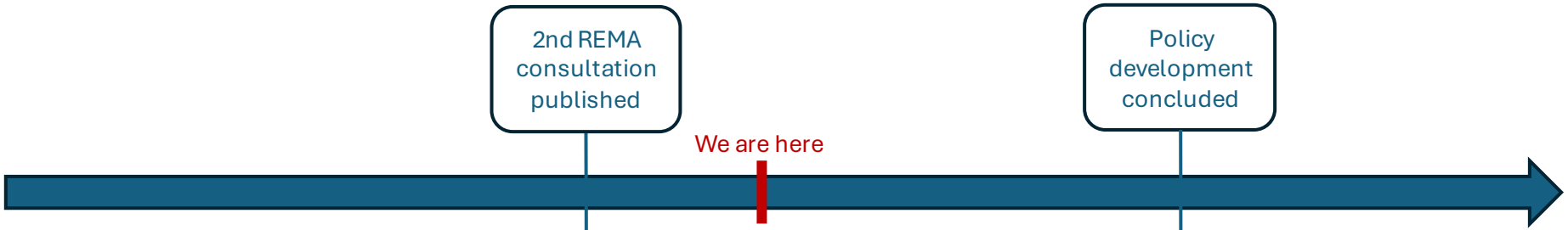
Ed Farley
Senior Market Development Lead

Dan Taylor
Market Strategy Analyst

DESNZ Intro

ESO

Dispatch work across the REMA phases



REMA phase 1

- DESNZ commissioned Arup to look at centralised dispatch
- Concluded that centralised dispatch could have benefits but challenging to implement

REMA phase 2

- ESO leading development of dispatch options due to expertise in this area
  - Case for change (supported by Afry)
  - Identify possible options
  - Develop options for REMA evaluation
- DESNZ working closely with ESO, and final decision will be with DESNZ

REMA phase 3

- Implementation of preferred options following options assessment

Department for Energy Security & Net Zero

ESO Intro

Introduction

- ESO is supporting DESNZ' REMA Programme by leading the 'Dispatch' workstream.
- This includes assessing self-dispatch (such as options for Balancing Mechanism reform) and central dispatch

Establish the case for change

Build shared understanding of what issues should be addressed with scheduling & dispatch reform

Identify possible solutions

Work with industry, within REMA programme timescales, to identify options for reforming dispatch arrangements

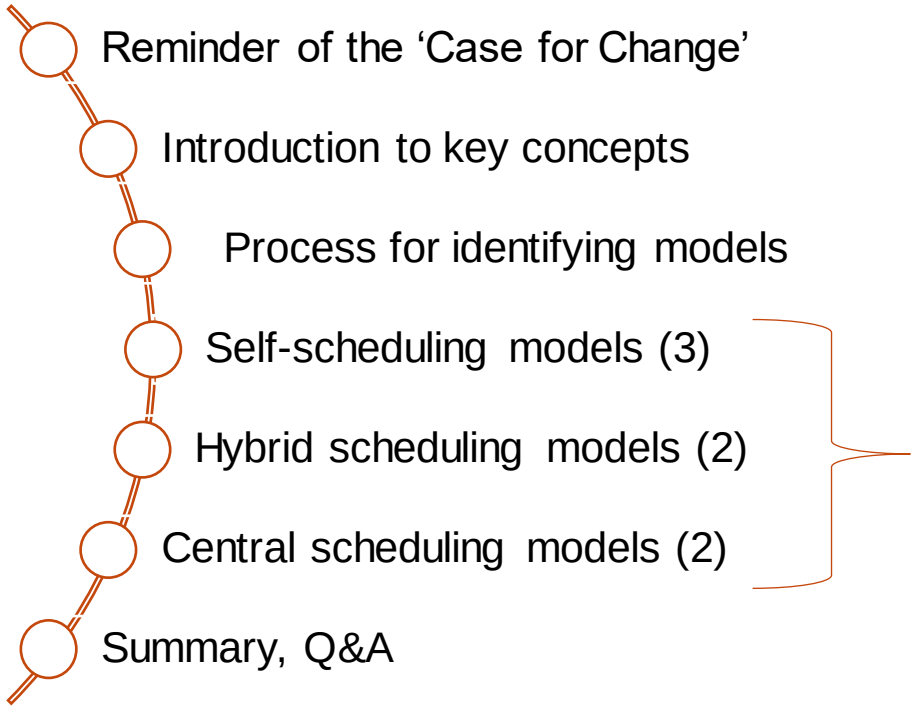
Develop solutions for REMA evaluation

Identify shortlist of dispatch options and support DESNZ to assess within the broader REMA programme

Objectives and Structure of this workshop

Objectives are to:

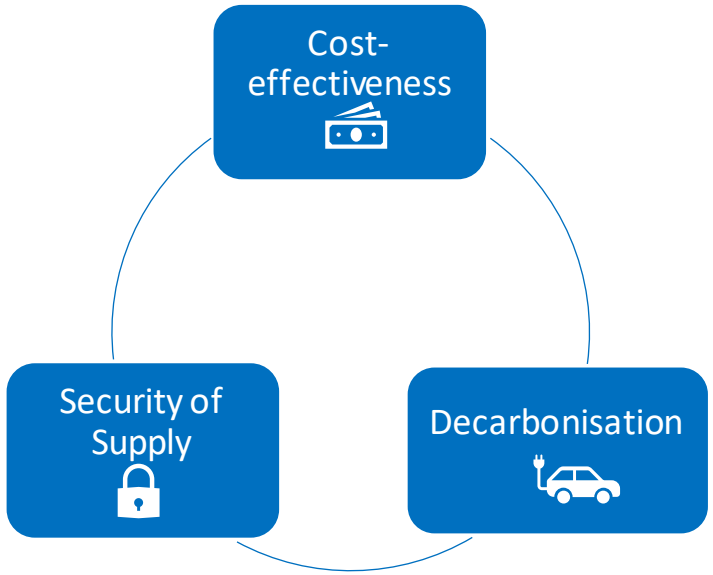
- Provide opportunity to discuss the strawman models and get your input on whether we've identified the right design choices
- Identify the hypothesised pros/cons of each model – i.e have we correctly scoped the arguments for and against
- **Not** to evaluate the different models



Breakout sessions to discuss each strawman model

REMA is aiming to identify and implement the reforms needed to facilitate decarbonisation of the electricity system, while maintaining energy security and affordability for consumers

REMA objectives



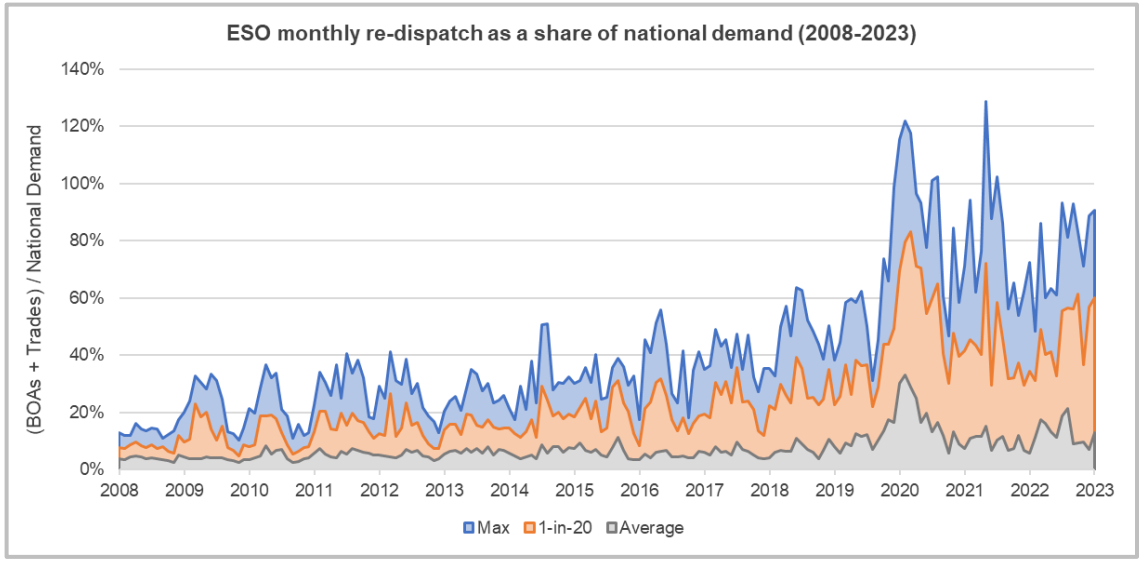
REMA assessment criteria

- Value for Money
- Deliverability
- Investor Confidence
- Whole System Flexibility
- Adaptability

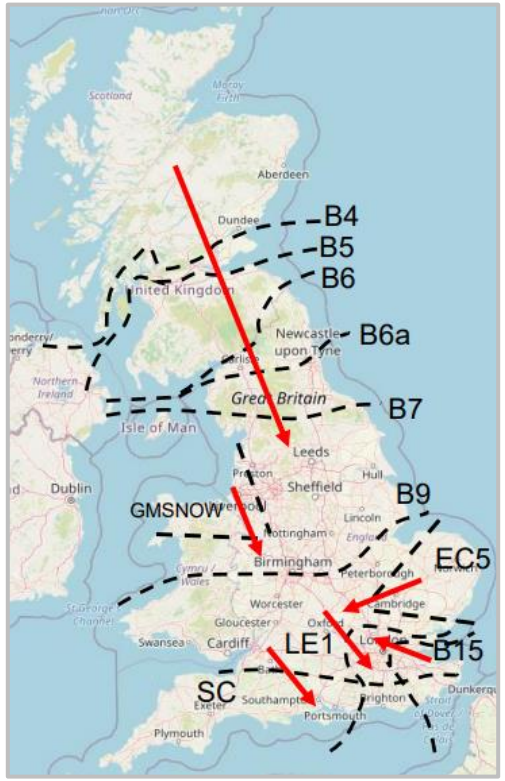
Reminder of the case for change for scheduling & dispatch

The current GB dispatch arrangements were introduced in a very different market and network context from today

ESO is re-dispatching increasing volumes away from the self-dispatched market position



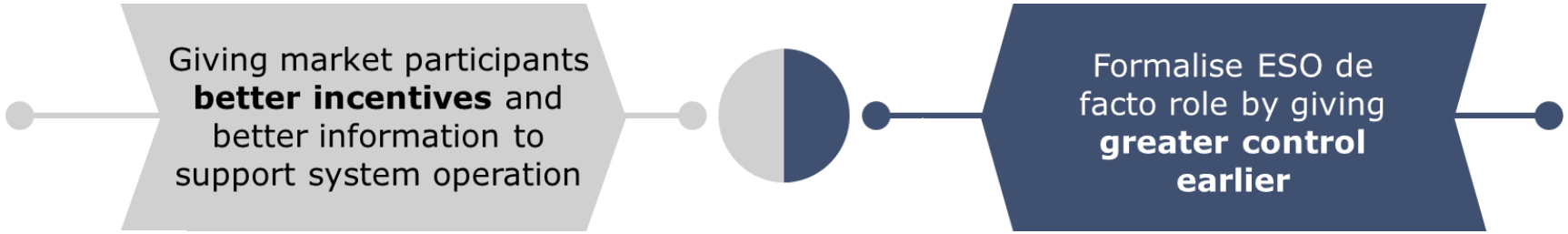
The GB network has multiple bottlenecks which can be active independently or together in different combinations, and can be interdependent with each other



AFRY's 'Case for Change' established 3 underlying issues

Key limitations of the 'status quo' scheduling and dispatch regime

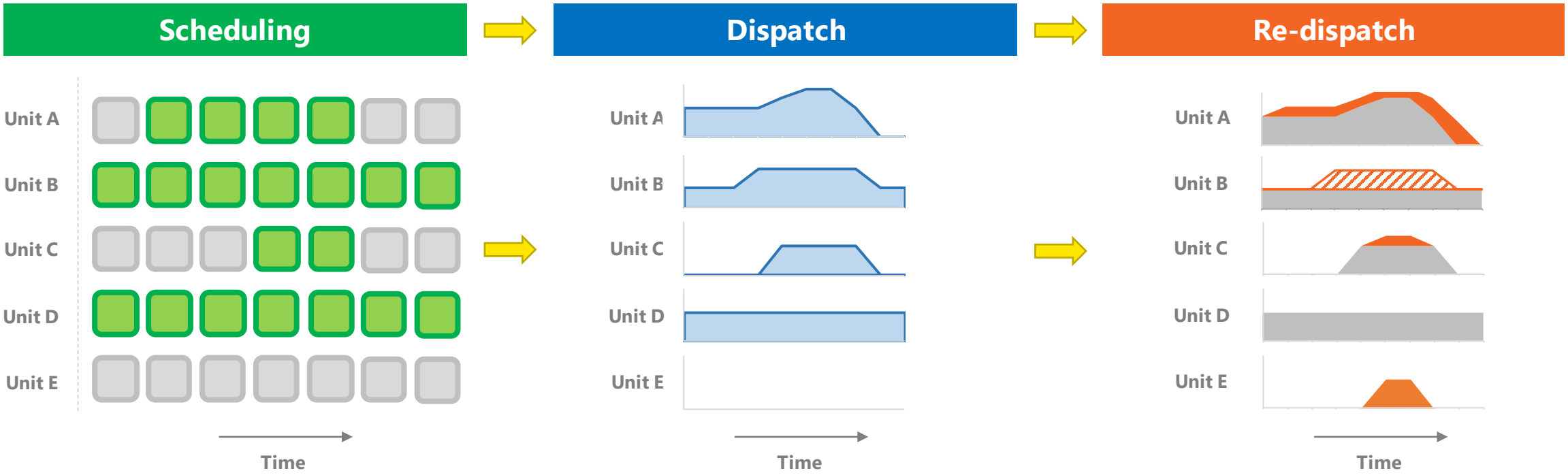
What is less clear is what to change to … **There are two high-level approaches:**



AFRY

Introduction to key concepts

What are ‘scheduling’ & ‘dispatch’?



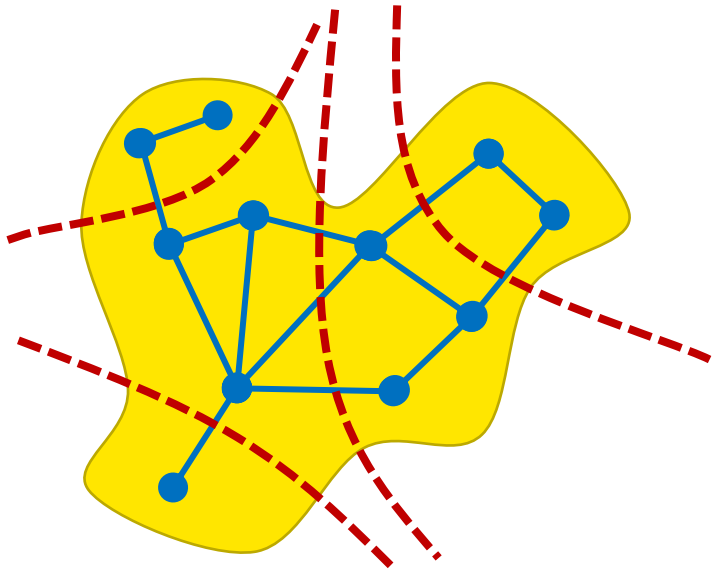
- Start-up and shut-down decisions about units (especially with longer minimum on / off times)
- Also known as ‘Unit Commitment’
- Can start months and years ahead with forward trading, and is refined down to around 4 – 24 hrs ahead

- Decisions about the exact output level and profile of units
- Refined as real-time is approached and more detailed information and forecasts are known

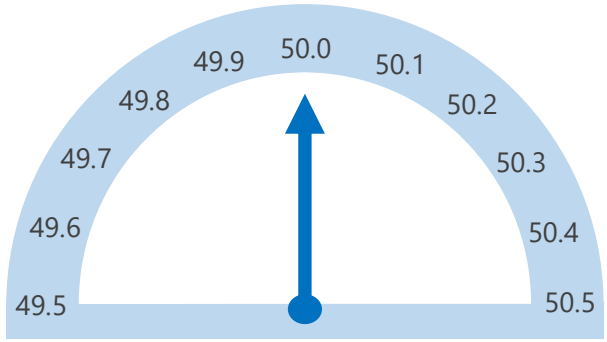
- Changes to the dispatched output near real-time, to ensure the physical needs of the system are met (balancing, constraints, inertia, voltage etc.)

What affects the level of re-dispatch?

Scheduling → **Dispatch** → **Re-dispatch**



Constraints, voltage, inertia etc.



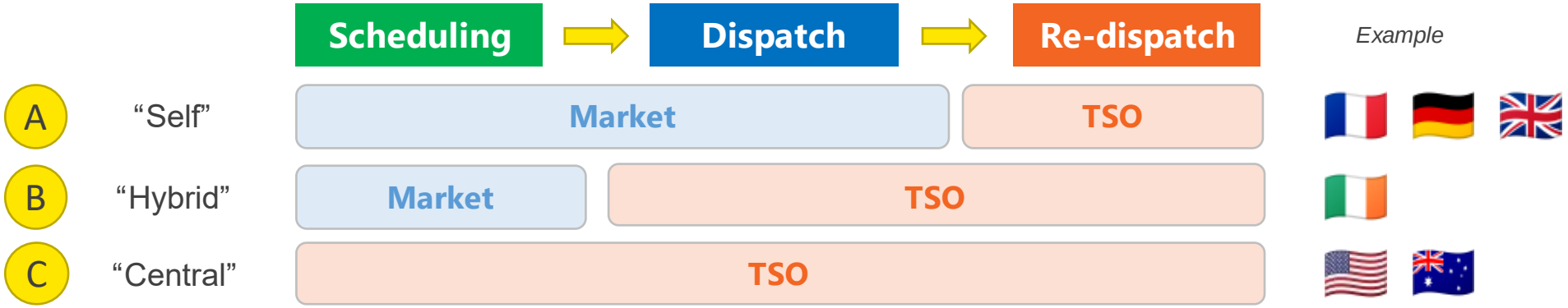
Frequency & balancing

- The extent to which re-dispatch is required depends on how well the scheduling and dispatch meet the physical needs of the system:

  "Better" scheduling and dispatch → less re-dispatch

- Reducing re-dispatch relies on either:
  - the right price signals and incentives to meet the real-time needs, or
  - explicit consideration of the real-time needs in the decision making
- The key question is the trade-off between the efficiency and cost of each step

What are the high-level philosophies?



A Self

- Market participants can trade with each other, without reference to the TSO
- They set their own schedules and dispatch positions
- The TSO re-dispatches as needed
- Price signals (such as imbalance and locational pricing) can be used to incentivise the scheduling and dispatch to respect the physical needs of the system

B Hybrid

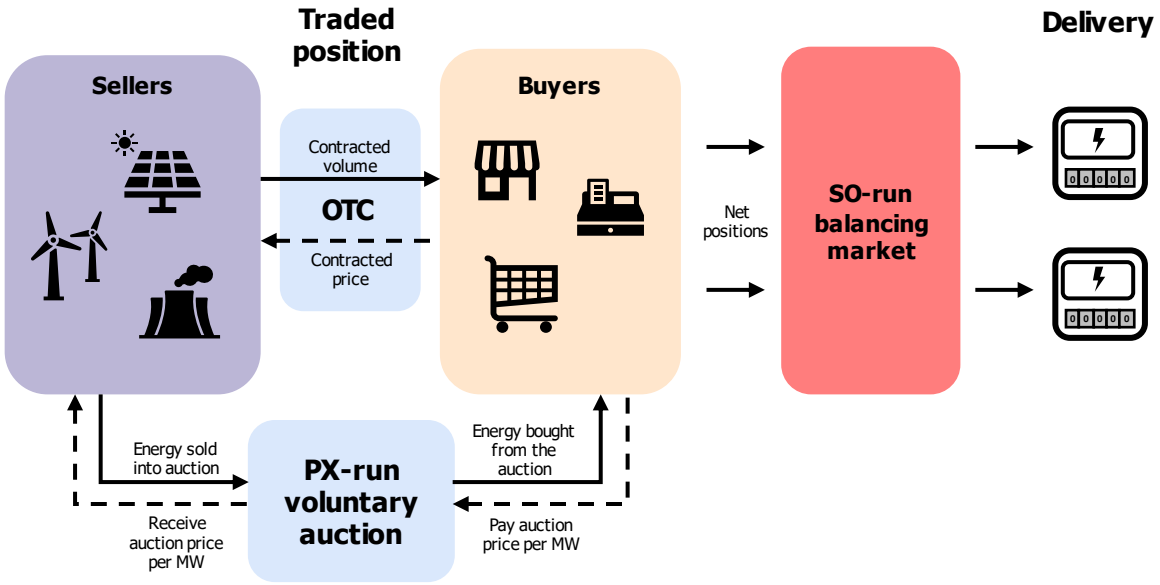
- Market participants can trade with each other, in a limited way, without reference to the TSO
- Their schedule matches their traded position in the market
- TSO calculates a secure dispatch position starting from the market scheduled position
- Price signals can be used to incentivise scheduling and dispatch that respects system needs

C Central

- Market participants transact through a centralised market run by the TSO
- Schedules and dispatch position are decided through a centralised market algorithm
- Minimal re-dispatch is needed, as the previous steps directly reflect the physical needs of the system
- Incentives are focused around units following the dispatch positions

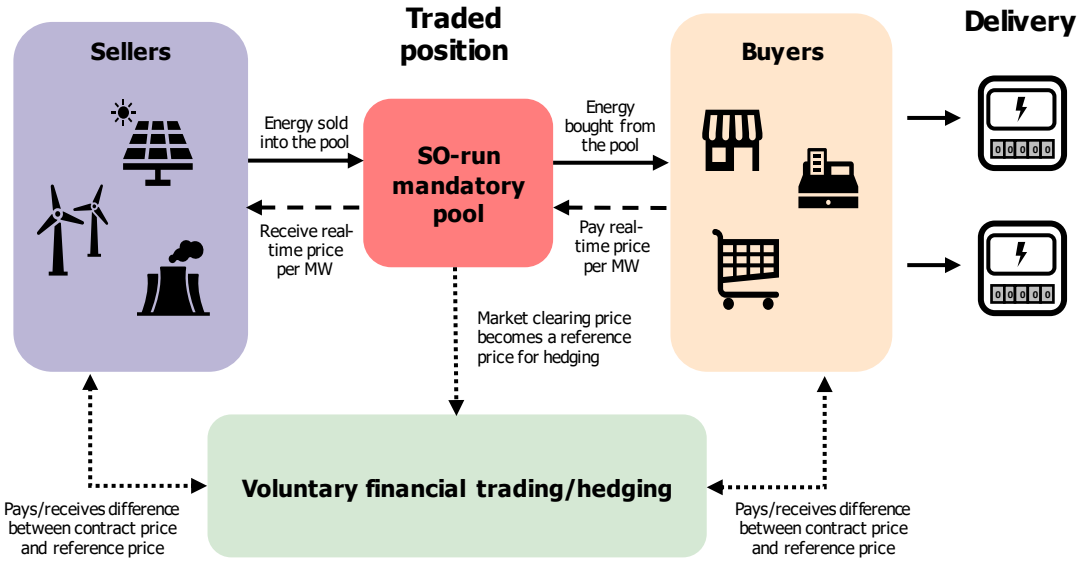
Whether the market is a ‘net pool’ or a ‘gross pool’ has significant implications for how market parties trade

Net Pool



- Buyers and sellers can contract directly for the physical delivery of electricity, without reference to a central market
- SO takes re-dispatch actions to make sure delivery meets the physical needs of the system
- Market parties are exposed to ‘imbalance’ costs for difference between traded and delivered volumes

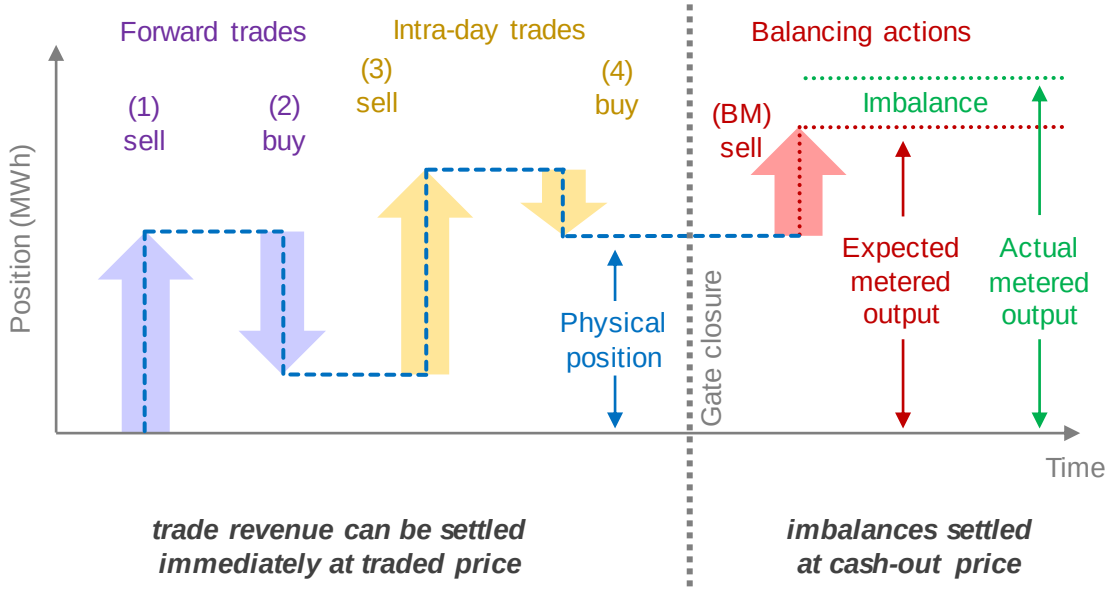
Gross Pool



- All physical delivery of electricity is managed through a mandatory ‘pool’ run by the SO
- For each period, all production and consumption is settled at the real-time price
- Bilateral contracts between market participants can take place ahead of time, but they are typically financial hedges against the real-time price

The models we will discuss also vary in whether forward trading is financial or physical

Physical

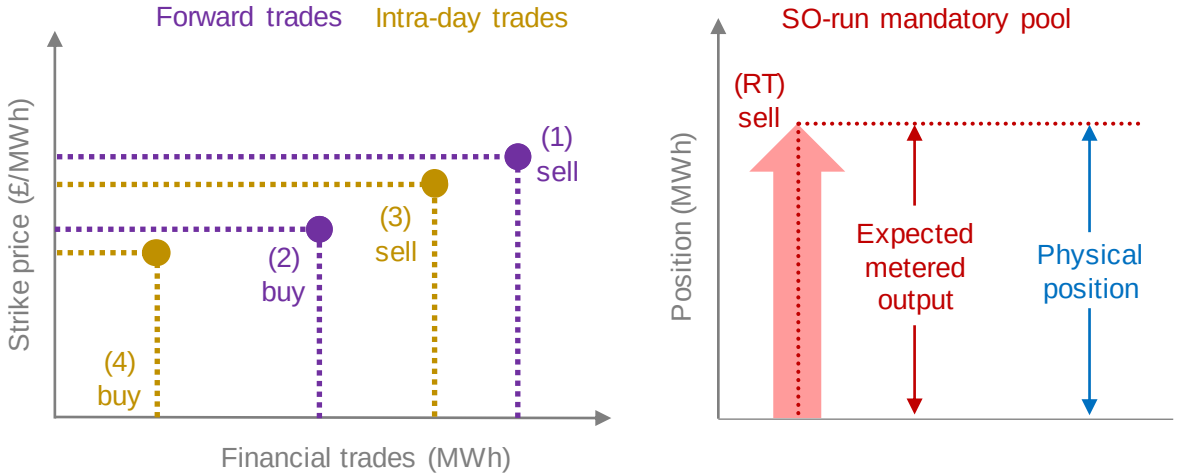


trade revenue can be settled immediately at traded price

imbalances settled at cash-out price

#	Type	Quantity	Price	Revenue
(1)	Sell	+ 100 MW	£ 50 / MWh	+ £5,000
(2)	Buy	- 60 MW	£ 35 / MWh	- £2,100
(3)	Sell	+ 80 MW	£ 40 / MWh	+ £3,200
(4)	Buy	- 20 MW	£ 32 / MWh	- £ 640
BM	Sell	+ 30 MW	£ 34 / MWh	+ £1,200
Total		**130 MW**	**-**	**+ £6,480**

Financial



trade revenues settled later, once real-time price is known

#	Type	Quantity	Strike price	Real-time price	Revenue
(1)	Sell	+ 100 MW	£50/MWh	£ 34 / MWh	+ £1,600
(2)	Buy	- 60 MW	£35/MWh	£ 34 / MWh	- £ 60
(3)	Sell	+ 80 MW	£40/MWh	£ 34 / MWh	+ £ 480
(4)	Buy	- 20 MW	£30/MWh	£ 34 / MWh	- £ 80
RT	Sell	+ 130 MW		£ 34 / MWh	+ £ 4,420
Total		**130 MW**	**-**	**-**	**+ £ 6,480**

Process for establishing options

Process overview

Following the assessment of the case for change to scheduling and dispatch arrangements, we have followed a clear process to establish options for reform as part of the REMA programme.

Assessing the case for change

Defining building blocks for dispatch

Dispatch is not a binary choice between self- and central- dispatch; hence, we have created a suite of building blocks to highlight the key features and design choices.

Establishing the counterfactual

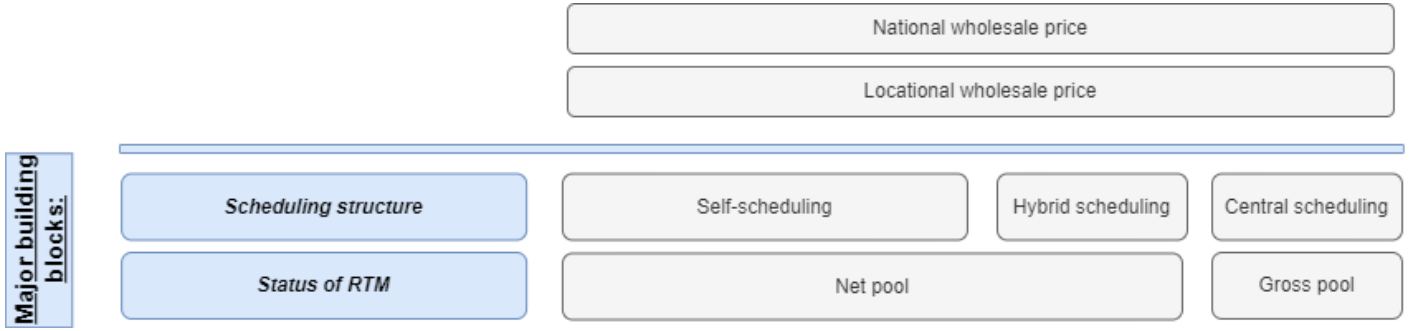
There are some reforms that could impact dispatch efficiency which could be delivered independently of REMA policy reform. We categorised these into counterfactual and counterfactual+ scenarios.

Creating strawman models

To facilitate discussion and highlight the key trade-offs between design features, we have created a set of strawman models using the major building blocks.

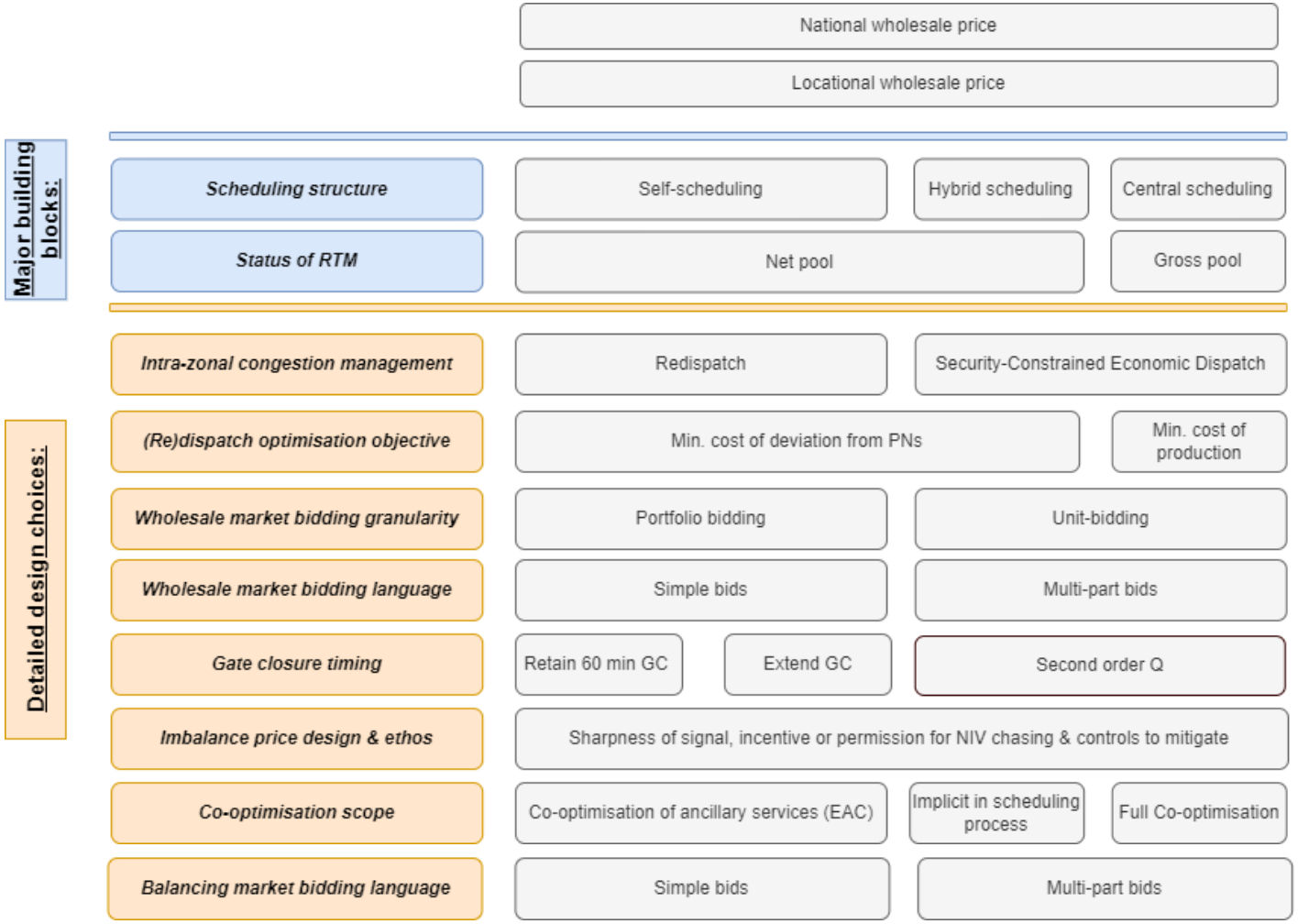
Dispatch model building blocks

Defining building blocks for dispatch models



- The two major building blocks in the models are:
  - scheduling structure
  - status of the Real-Time Market (RTM)
- There are then detailed design choices under the different major building blocks, plus further supplementary design choices
- The diagram illustrates where certain options fit more naturally with other design choices

Defining building blocks for dispatch models



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  - scheduling structure
  - status of the Real-Time Market (RTM)
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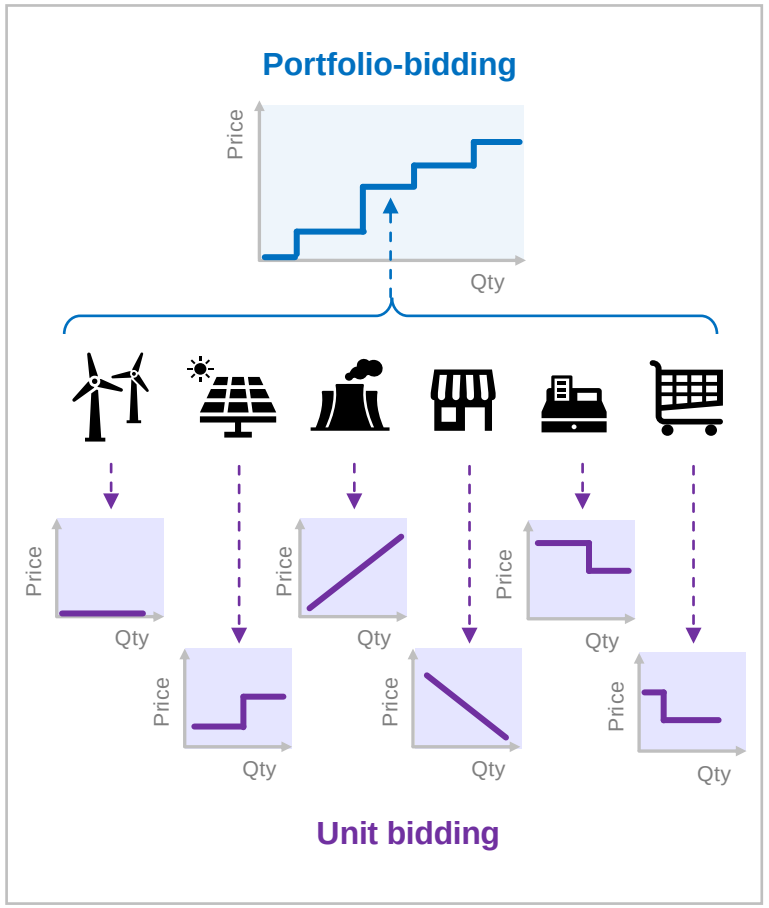
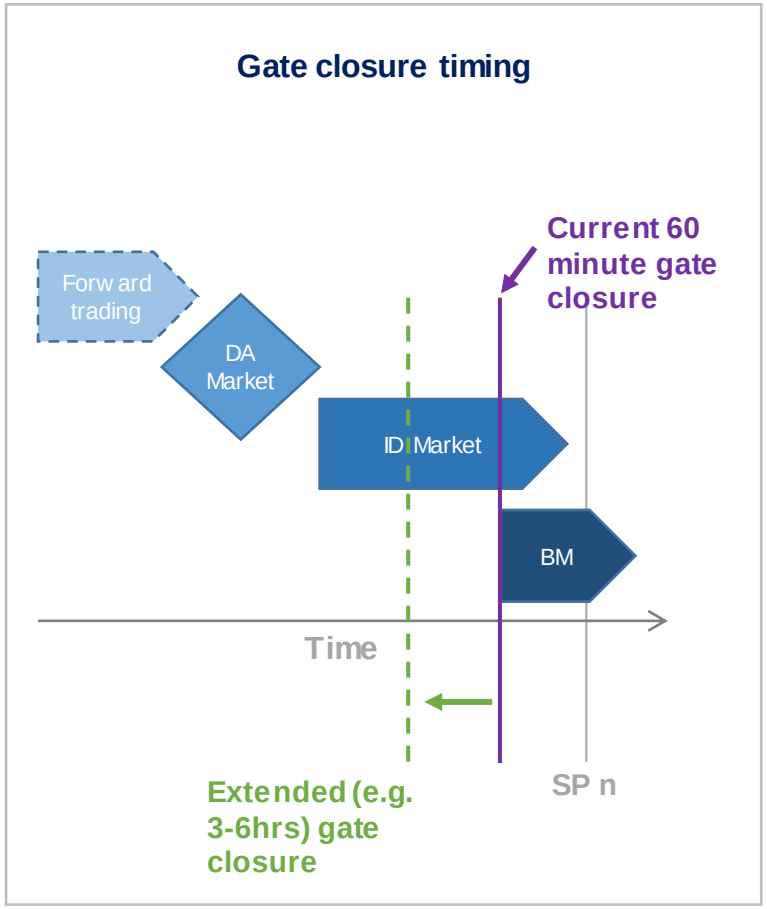
- The diagram illustrates where certain options fit more naturally with other design choices

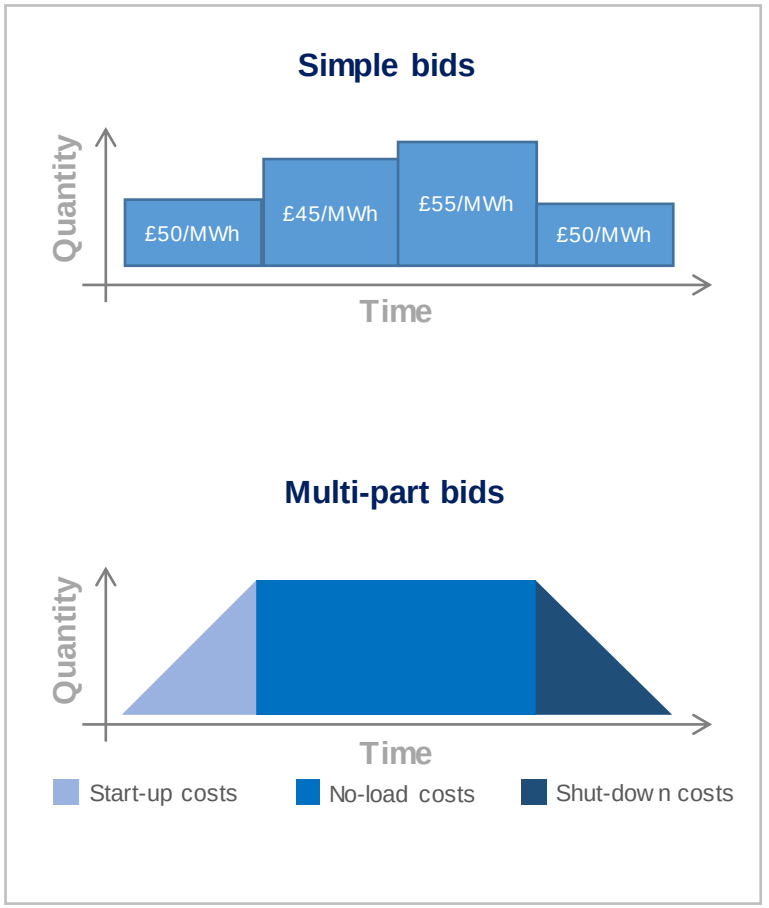
Detailed design choices are important in the efficacy of dispatch models



Portfolio or unit bidding determines whether or not the bids which participants submit in the wholesale market must relate to a particular unit



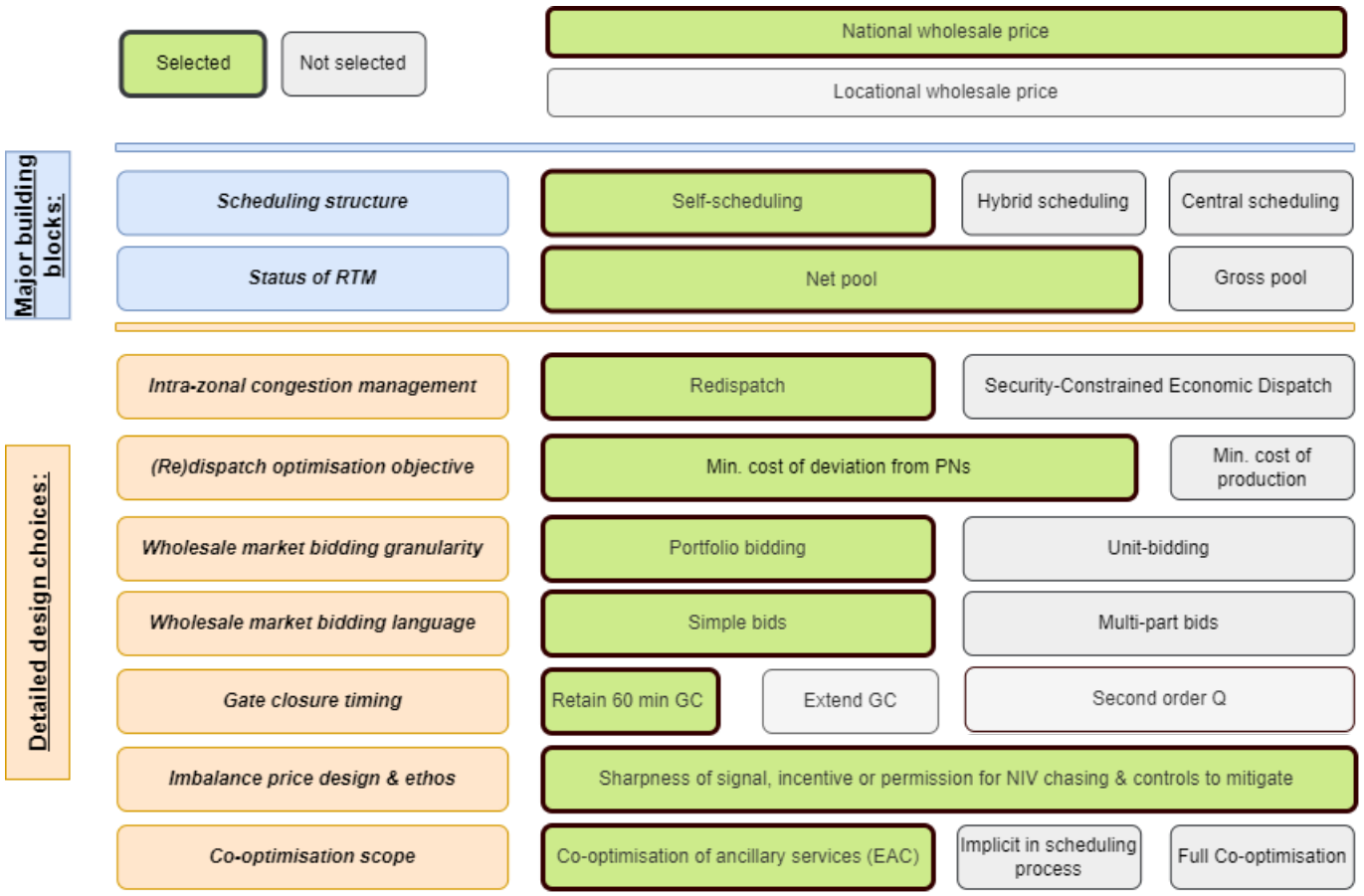
Gate closure timing determines the speed of the feedback loop between SO dispatch decisions and wholesale market trading



The structure of bids used in wholesale trading: simple bids reflect price & quantity, multi-part reflect technical unit characteristics

Establishing the Counterfactual

Status quo – Self-scheduling



Scheduling

- **Forward financial & physical trading** from Y+ ahead to intraday
- **Unconstrained wholesale market** which doesn't account for security or congestion and is cleared using simple bids reflecting price & volume

Dispatch

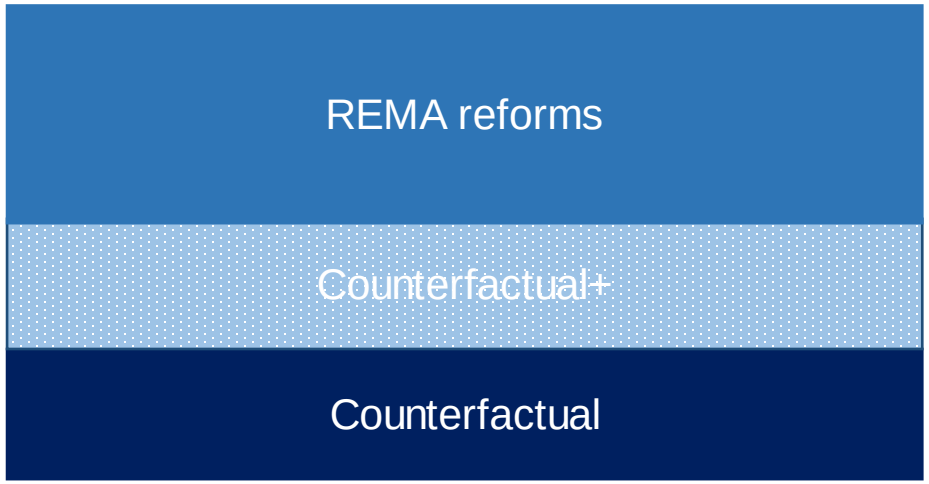
- **Net pool** – physical position = traded position
- Market responsible for balancing on **portfolio** level for each SP
- **Imbalance** signal designed to incentivise market to help balance the overall system

Redispatch

- SO is a **residual** balancer, intervening **after BM gate closure (60 mins)**
- Participants submit **simple bids** to move away from nominated position
- Constrained units compensated through BM

The ‘counterfactual’ establishes what baseline of planned or potential reforms could impact dispatch efficiency

- We have defined a list of planned or in-flight reforms that we think will impact dispatch efficiency.
- We have also identified options for reform under a ‘Counterfactual +’ scenario. These are potential reforms which we believe **could be delivered independently of wider REMA policy reform**.
- The options included in counterfactual+ **have not been assessed** and their inclusion does not necessarily mean ESO thinks they should be pursued



We have identified some reforms which may influence dispatch efficiency and should be considered in counterfactual and counterfactual+ scenarios

- Counterfactual – reforms which have been implemented or are planned for implementation
- Counterfactual+ – reforms which we believe could be implemented without **significant** policy intervention via REMA*

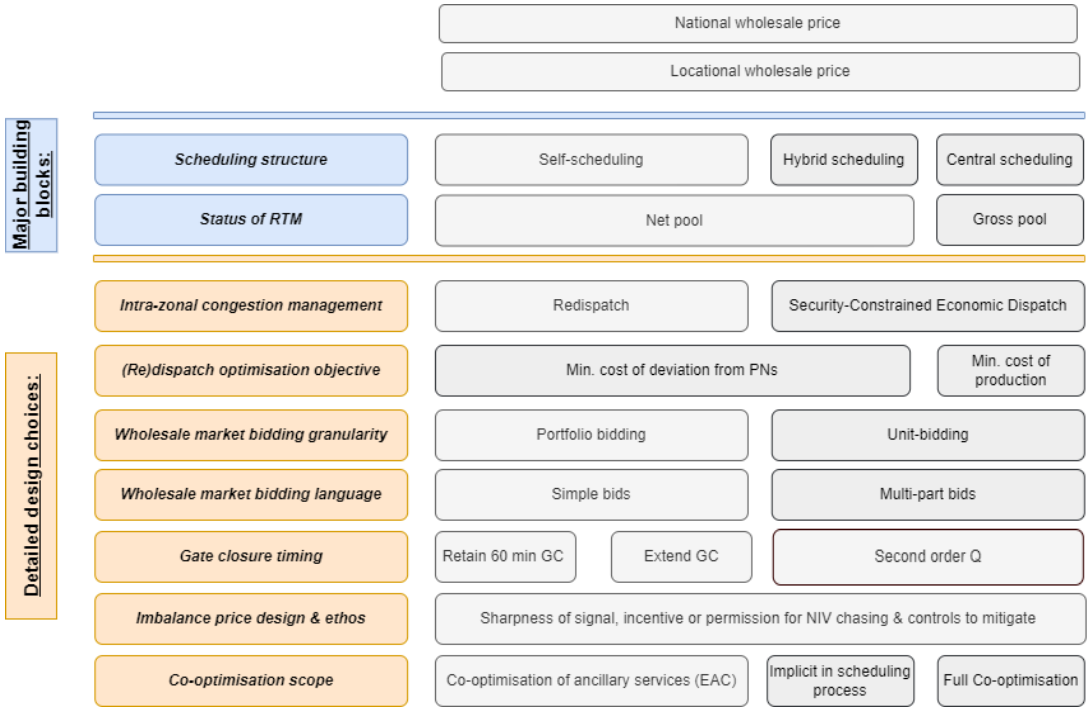
	Counterfactual	Counterfactual +
Network build	New transmission build to increase network capacity	
Ancillary service reform	Balancing Reserve	Closer to real time Reserve and Response procurement
	Co-optimisation of reserve & response	Locational procurement of Reserve & Response
	'System' ancillary services products (e.g., stability)	New constraint management solutions (inc. AS for constraints)
	Reserve reform	Maximising boundary transfer for constraints
		Improved Net Transfer Capacity (NTC) process
Code reform & interconnectors	Lower mandatory MW threshold for new BMUs	Final Physical Notification (FPN) Accuracy / Info imbalance
		DNO/TO Metering enhancements
		Maximum Export Limit / Stable Export Limit definition clarification
		Separating subsidy payments from BM bids/offers
		Portfolio ramp limits for Balanced Responsible Parties
		More efficient interconnector trading
BM & ESO systems reform	Open Balancing Platform launch	
	State of Energy of energy limited assets	

*Inclusion of option in Counterfactual + does not mean ESO has necessarily assessed it or supports its implementation

Introducing the strawman models

We broke different Dispatch mechanisms down into component 'building blocks', to identify 7 strawman models (3 × zonal, 4 × national)

Dispatch option 'building blocks' framework



7 strawman models identified

Model 1
Self-scheduling

- National 1a ↑ SO control
- National 1b ↑ Incentives
- Zonal 1

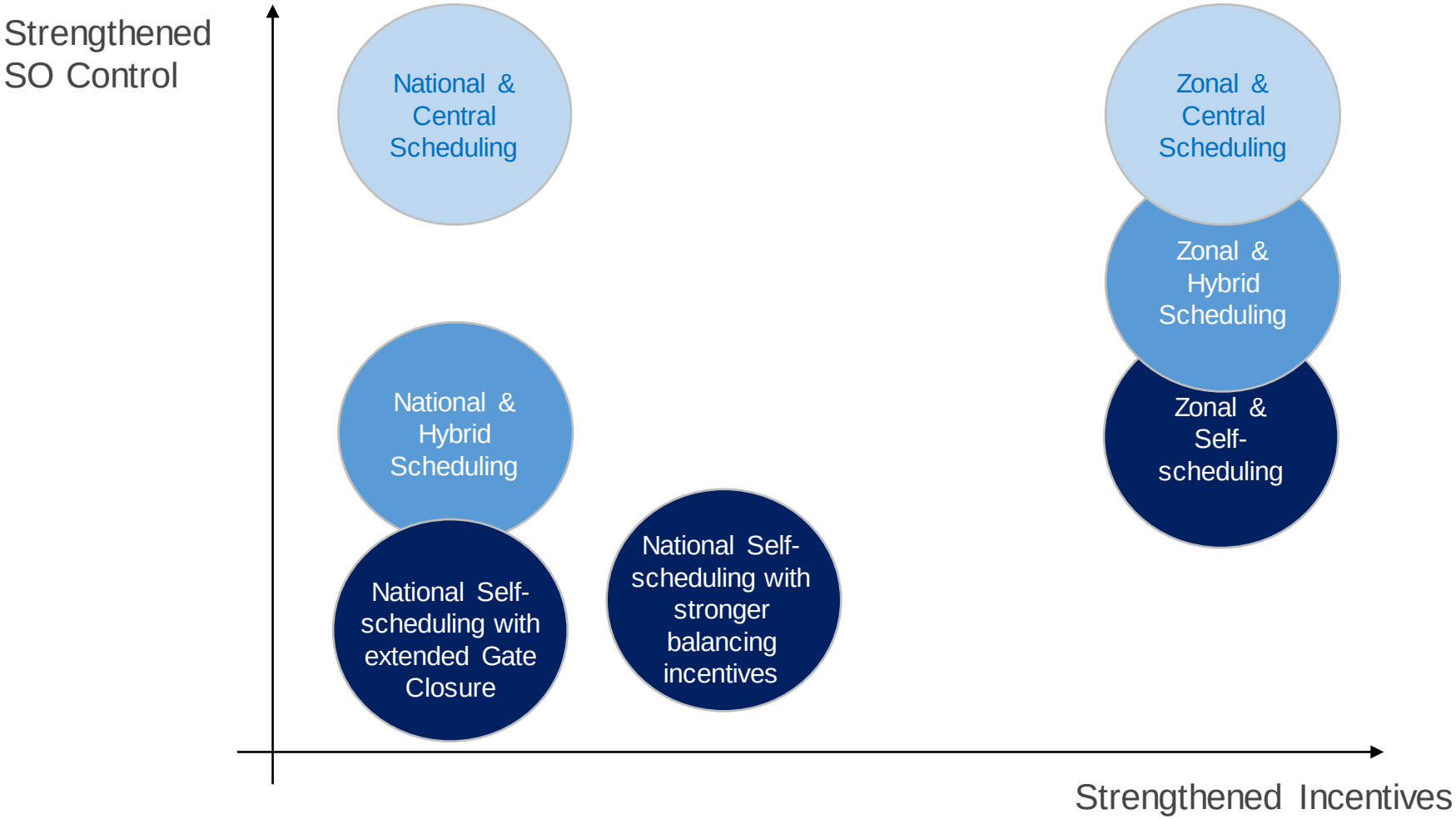
Model 2
Hybrid scheduling

- National 2
- Zonal 2

Model 3
Central-scheduling

- National 3
- Zonal 3

We can illustratively plot the models using the 'Incentives' vs 'Control' framing established in the Case for Change

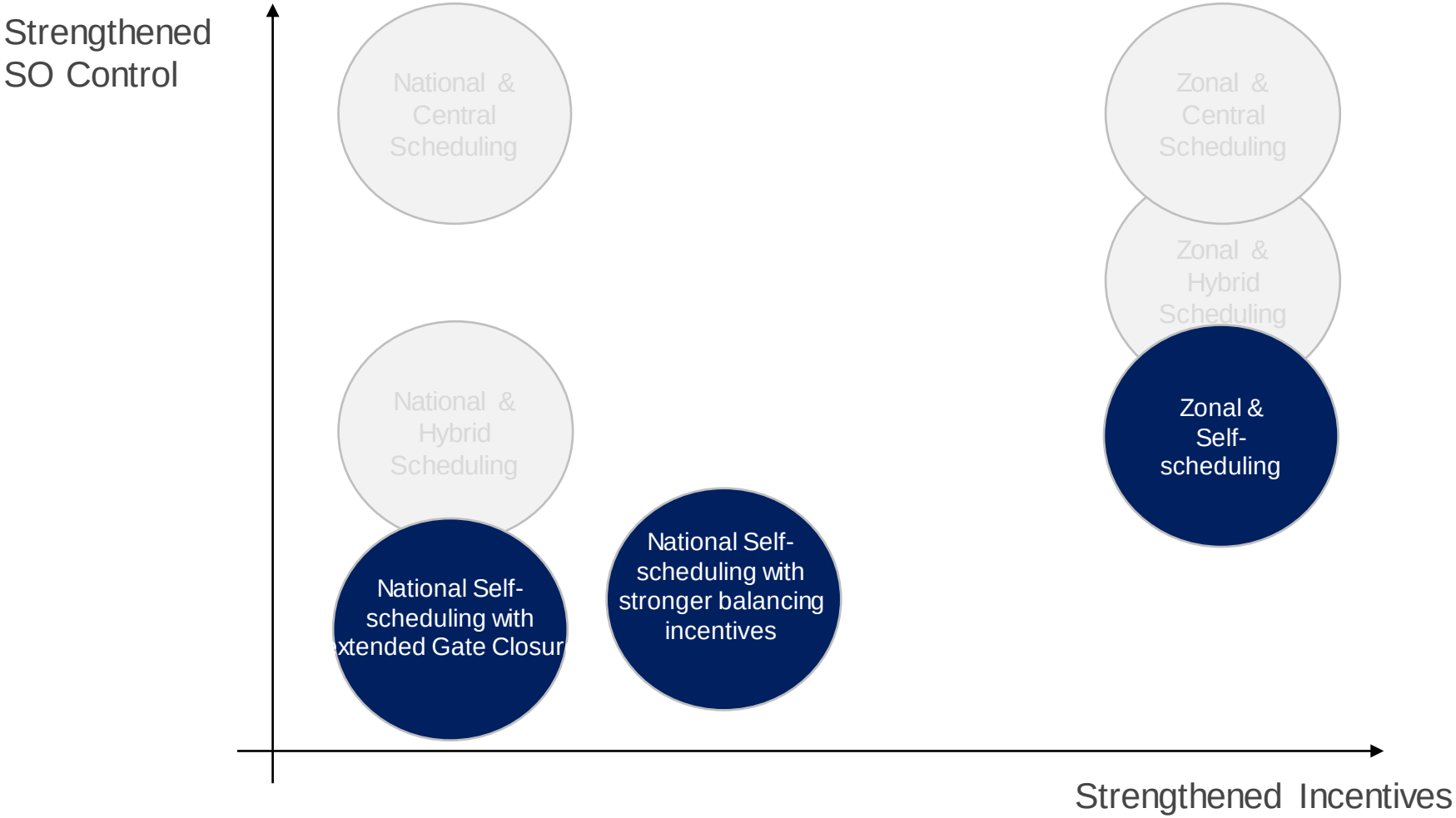


Break

Back at 14:20

Model 1: Self-scheduling

This section discusses the self-scheduling models



National Model 1a – Extended Gate Closure

Key features of this model

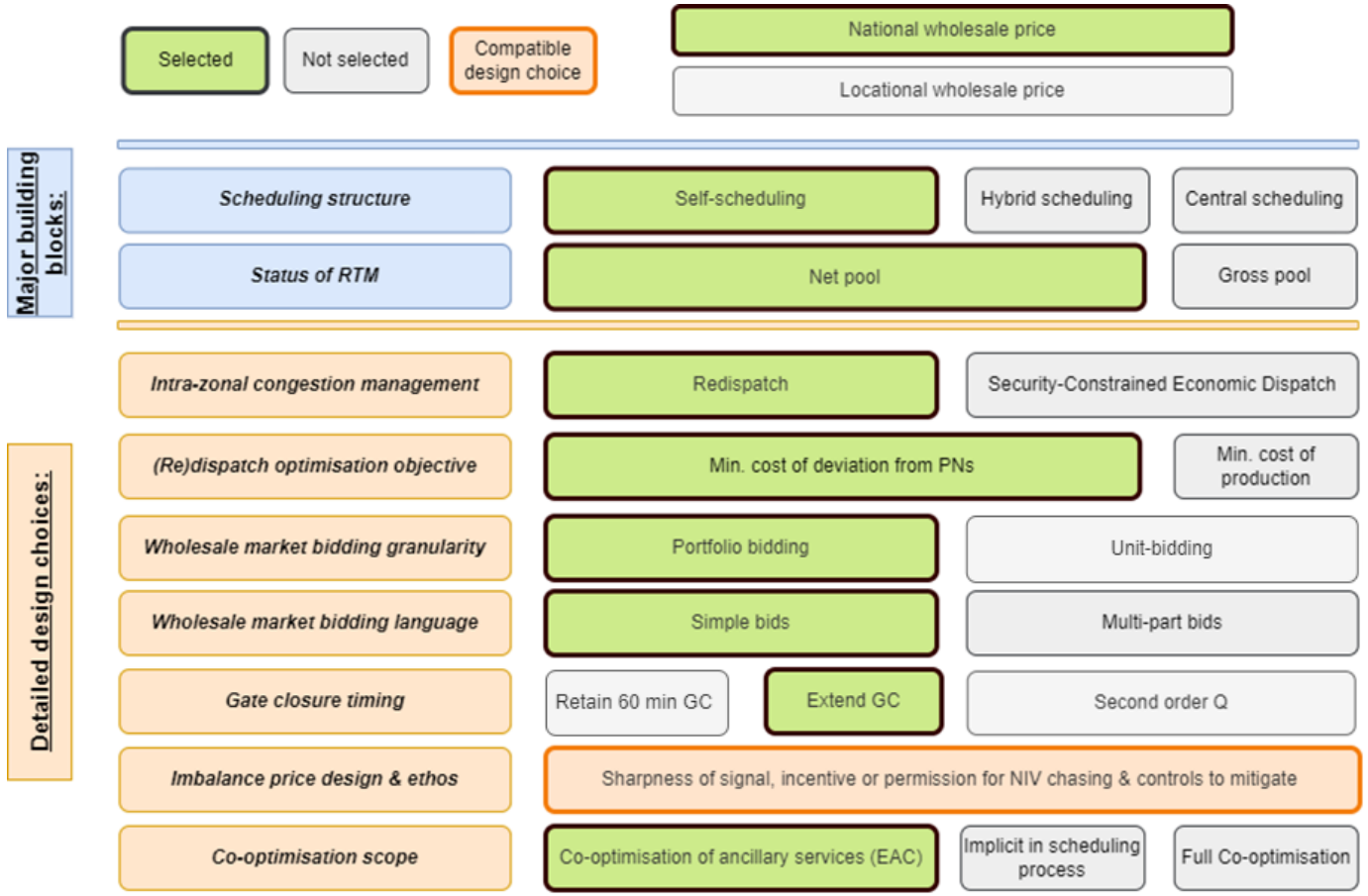
- Provide the System Operator with more time to make balancing decisions relating to inter-temporal constraints

What are the significant changes vs today?

- Extend gate closure beyond the current time (60mins) to a longer time (e.g., 3-6hrs)

What are the key changes for how market parties trade, compared to today?

- **Market timing:** Extended period between closing trading position and determination of system imbalance price
- **Market entry/exit:** May be more/less incentivised to leave BM, depending on asset type & size
- **Greater cash-out risk:** from earlier market closure (volume)
- Otherwise relatively little change, since no significant change to wholesale market bidding/settlement/ hedging approach



National Model 1b – Strengthened Balancing Incentives

Key features of this model

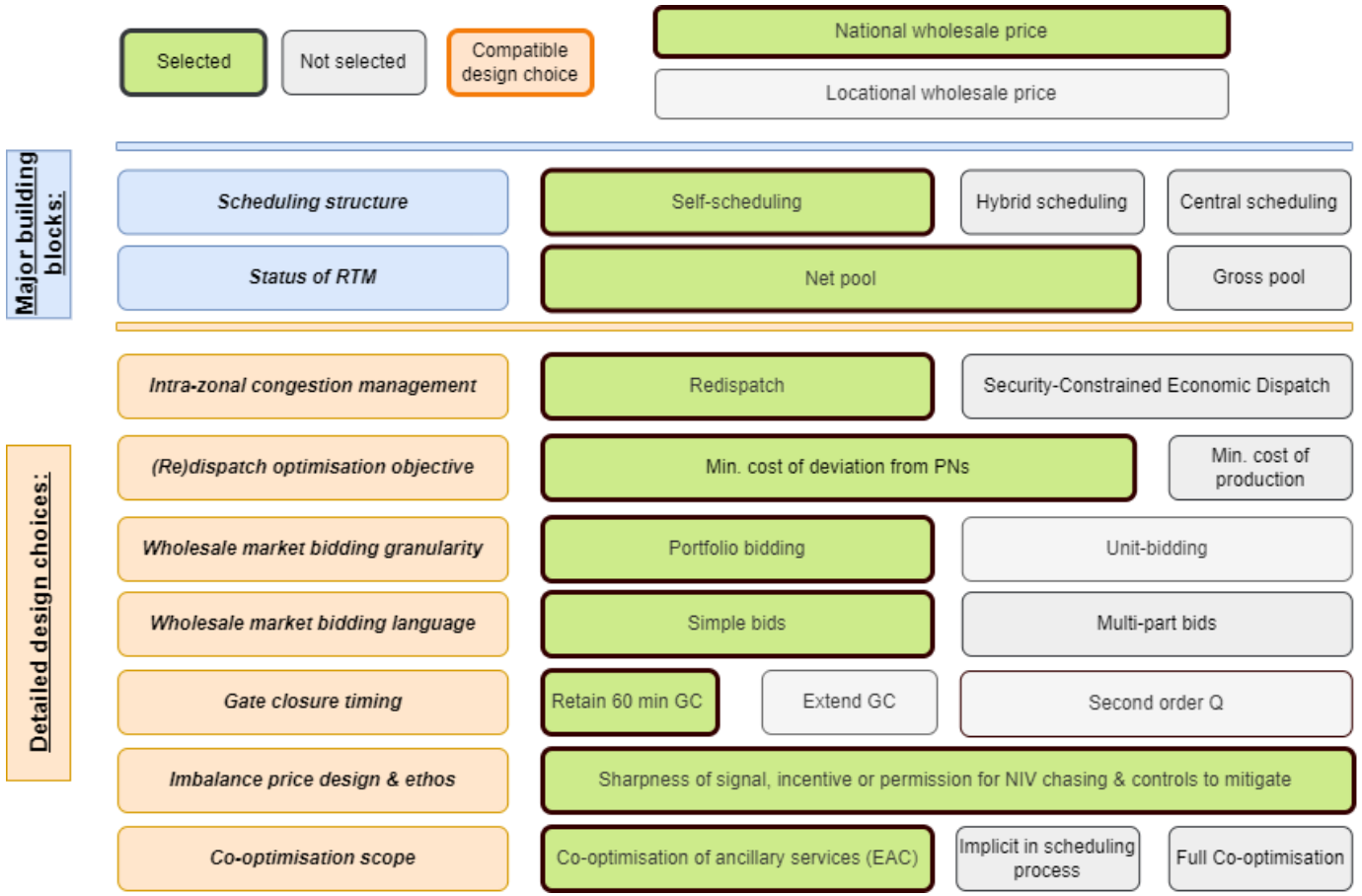
- Provide the market with stronger incentives to self-balance and reduce SO redispatch

What are the significant changes vs today?

- Re-introduction of dual imbalance pricing, re-alignment of wholesale market closure, shorter SP length, BM participation, change to BM pricing for energy actions, additional data transparency

What are the key changes for how market parties trade, compared to today?

- **Revenue outlook:** Improved BM revenue opportunities, and more concentration of competition in BM and intra-day (before Gate Closure)
- **Data:** 5-minute settlement would likely mean significantly greater data requirements from all players
- **Greater cash-out risk:** from dual-price (price)
- Otherwise no significant change to wholesale market bidding/settlement/ hedging approach



Summary of Hypothesised Pros and Cons

Pros

Both

- Retaining self-dispatch maintains **flexibility** for **portfolio owners**
- **Less complex implementation**
- **Compatible** with **existing cross-border** trading

Extended Gate Closure

- Provides more time for redispatch decisions which **helps manage intertemporal constraints**

Strengthened Balancing Incentives

- Re-pricing energy-flagged actions to the better of the imbalance price and the BOA price may **make the BM more attractive** vs NIV chasing
- Encourage market self-balancing, **reducing some redispatch**
- Shorter SPs **increase arbitrage opportunities** for flexible assets & provides incentives to resolve imbalance

Cons

Both

- Wholesale market continues to trade disregarding network constraints, meaning **redispatch remains high**
- Portfolio trading may **inhibit level playing field**
- Identifying **market power exploitation is more challenging** under self-dispatch and portfolio bidding

Extended Gate Closure

- **Limited** operational efficiency **savings**, as market achieves a less accurate position
- Renewables are likely to be exposed to **increased imbalance risk**
- ESO would, de facto, have greater balancing responsibility which contradicts self-dispatch ethos

Strengthened Balancing Incentives

- Significant **implementation complexity** of 5-minute SPs
- Higher barriers for smaller assets to participate in system balancing in BM vs NIV chasing

Zonal Model 1 – Self-Scheduling

Key features of this model

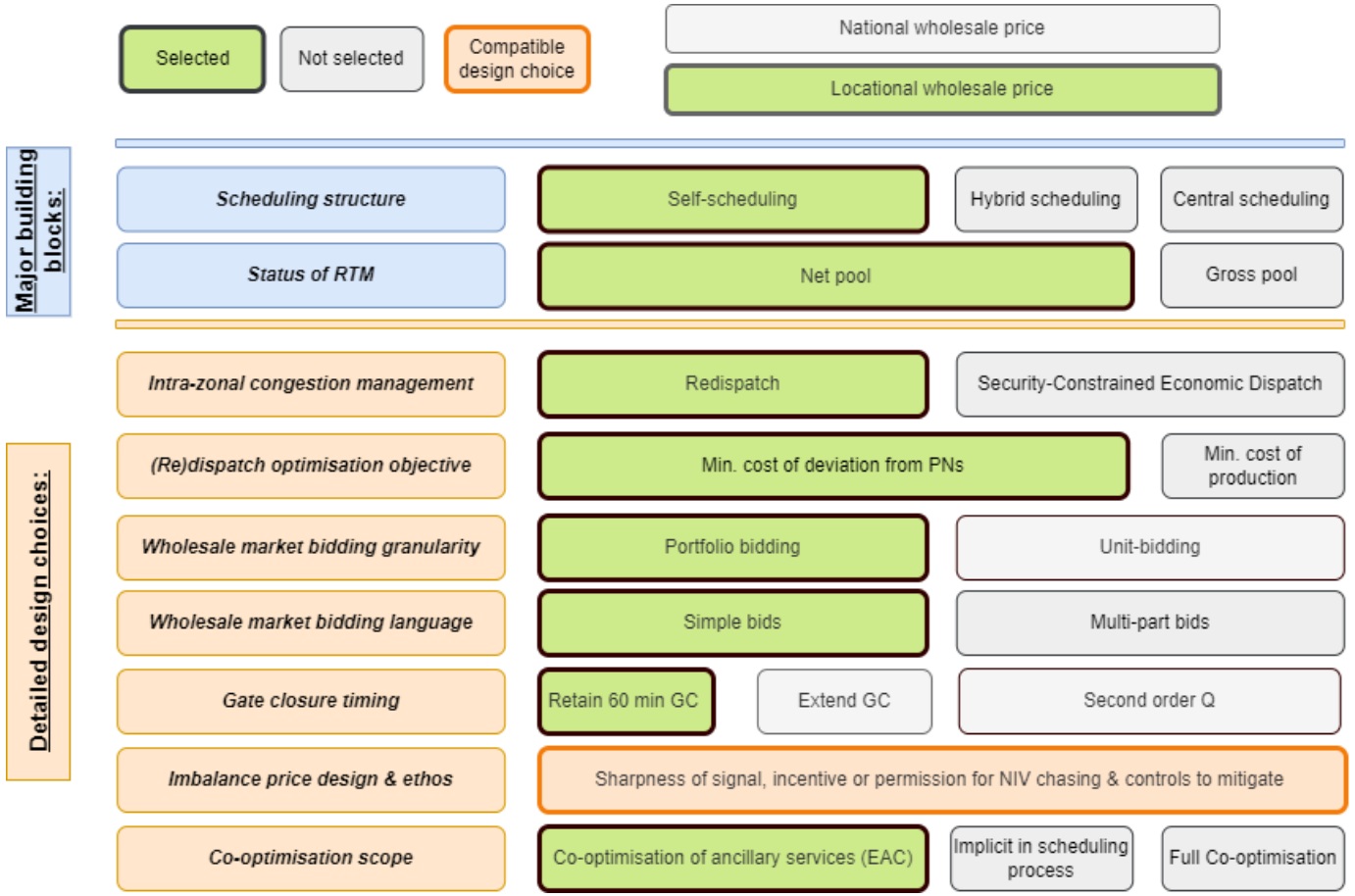
- Introduce locational signals in the wholesale market whilst maintaining self-scheduling to encourage participants to schedule according to network congestion

What are the significant changes vs today?

- Introduce zonal pricing but maintain current scheduling arrangements
- Parties only have unrestricted physical access to transmission network within their zone
- Trading between zones requires new market coupling mechanisms and associated governance within GB

What are the key changes for how market parties trade, compared to today?

- **Price risk:** Need to manage potential changing price differences between zones in forward and spot markets
- **Change to contracting:** Potential move to greater financial forward trading, since physical transactions between zones cannot be guaranteed before DA/ID auctions



Summary of Hypothesised Pros and Cons

Pros

- **Zonal price would support efficient scheduling & dispatch,** avoiding costly re-dispatch to manage constraints and maximising use of flexible resource such as storage
- Zonal pricing could **reduce the scope for market power exploitation** by providing consistent price signals over different timeframes
- Retaining self-dispatch **maintains flexibility for portfolio owners** to optimise within their zone and between uncongested zones
- Retaining self-dispatch **avoids some implementation complexity** compared to other options (e.g. cross border trading)
- Improved spot market liquidity, as marginal generators priced out of a national wholesale market may clear under zonal

Cons

- Significant change which would involve **complex implementation**, including new market coupling process and governance
- Zonal pricing would create **new price risks** for some market participants
- **Portfolio trading** may inhibit a level playing field by **disadvantaging smaller players** who have fewer assets
- **Uncertain zonal price differences** when contracting between zones **dampens incentives for forward trading**, reducing forward liquidity
- Move from physical to financial trading for interzonal transactions could **change** market participant **collateral requirements,** creating transition risk and potential higher trading costs
- **Market clearing algorithm** and simple bids may be **limited in solving intertemporal constraints** in full
- Potential for **inefficient allocation of interzonal capacity** at different timeframes

Are the key features of the self-scheduling models clear?

Break out 1: Self-scheduling

Do you agree with the hypothesised pros and cons we have identified so far? What else should we be considering?

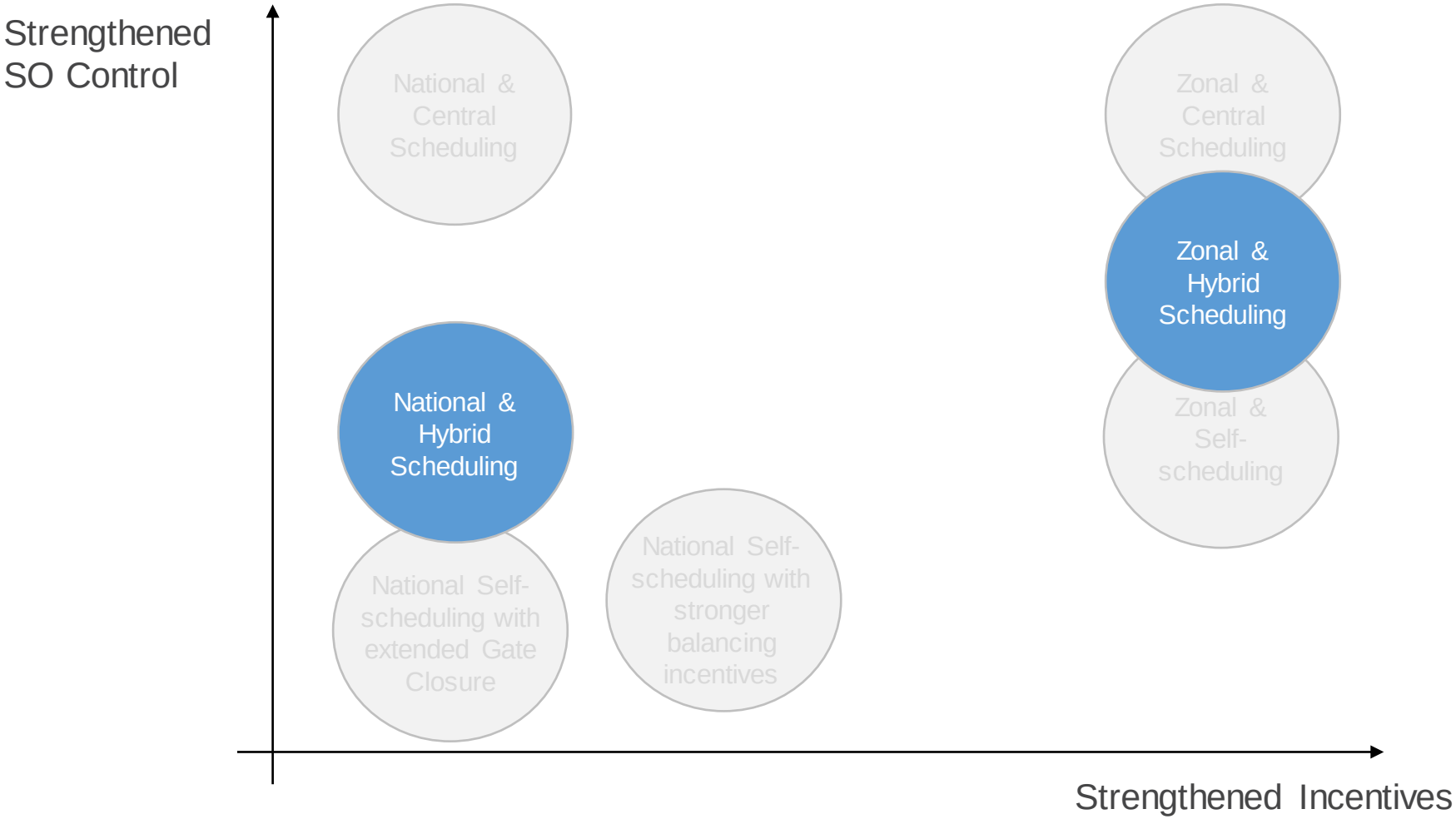
Which ones do you think are the most important for the REMA objectives?

Break

Back at 15:05

Model 2: Hybrid scheduling

This section discusses the hybrid-scheduling models



National Model 2 – Hybrid Scheduling

Key features of this model

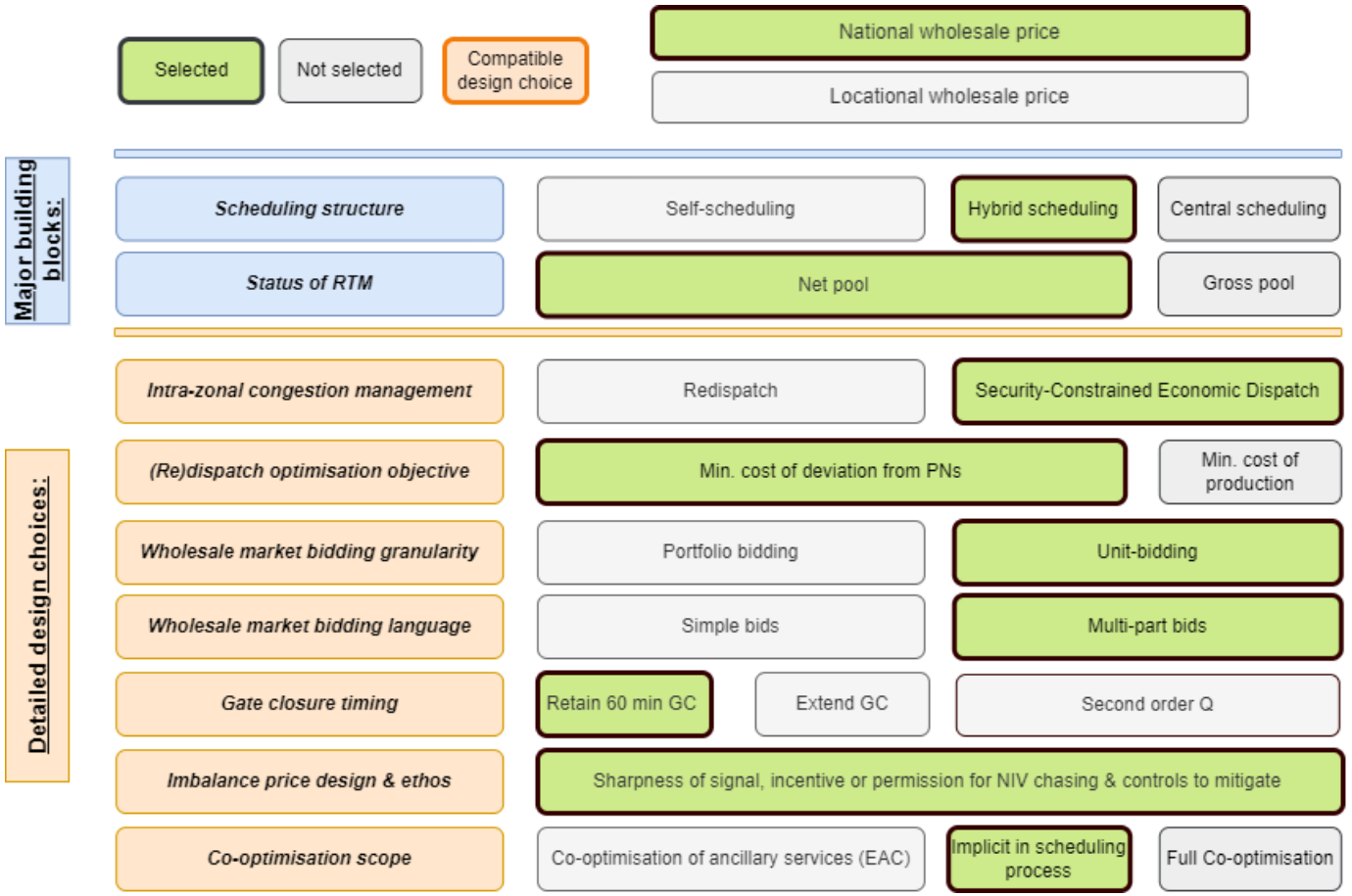
- Formalise the role of the SO as a central dispatcher by providing a mandate and the optimisation tools to manage intertemporal and network constraints

What are the significant changes vs today?

- Introduce Security Constrained Economic Dispatch (SCED) optimisation model to codify long-term scheduling decisions
- Move all physical trading to new DA/ID market, and to be on a unit basis.
- SO is no longer 'residual balancer' but has codified mandate to schedule

What are the key changes for how market parties trade, compared to today?

- **Change to contracting:** Replacement of OTC physical forward trades with financial hedges for trading before DA and ID
- **Bidding and settlement:** Submit unit level bids for wholesale transactions; and settlement at unit level



Zonal Model 2 – Hybrid Scheduling

Key features of this model

- Formalise the role of the SO as a central dispatcher by providing a mandate and the optimisation tools to manage intertemporal and network constraints effectively.

What are the significant changes vs today?

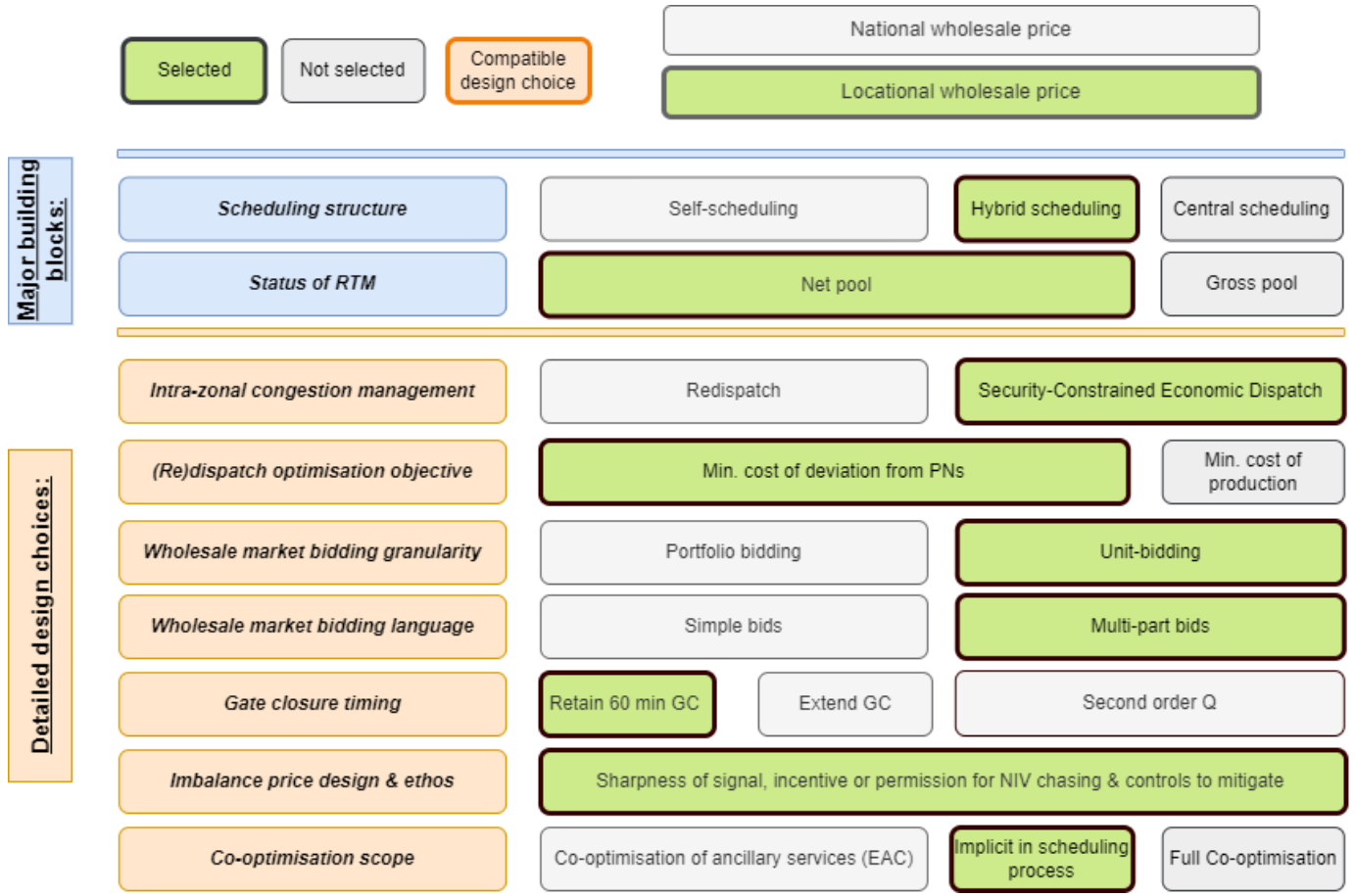
In addition to changes under national pricing:

- Parties only have unrestricted physical access to transmission network within their zone
- Trading between zones requires new market coupling mechanisms and associated governance within GB

What are the key changes for how market parties trade, compared to today?

In addition to changes under national pricing:

- **Price risk:** Need to manage potential changing price differences between zones in forward and spot markets



Model 2
Hybrid scheduling

National 2

Zonal 2

Summary of Hypothesised Pros and Cons

Pros

Both models

- Long-term scheduling process would support **more consistent treatment of intertemporal constraints** vs today
- More **transparent dispatch governance** due to formalisation of ESO de facto central dispatcher role
- Continued physical trading at DA/ID **avoids some impact on cross-border trade** vs full central dispatch
- Unit-level bidding supports market monitoring and level playing field

National

- **Lower implementation** effort than zonal, particularly for capacity management processes

Zonal

- Locational incentives would significantly **improve efficacy of scheduling & dispatch decisions** by reducing redispatch for constraints
- Zonal pricing could **reduce the scope for market power exploitation** by providing consistent price signals over different timeframes

Cons

Both models

- Structural overlap between MO and SO could **blur redispatch decision making** and lead to reduced market efficiency
- Move from physical to financial trading could **change** market participant **collateral requirements,** creating transition risk and potential higher costs
- Unit level bidding could **reduce some flexibility** for **portfolio players**
- Wholesale market continues to trade in parallel to SCED, reducing **operational efficiency benefits** since optimisation uses out of date data

National

- Wholesale market continues to trade disregarding network constraints, meaning **redispatch remains high**
- **Significant implementation complexity** from change to DA/ID markets

Zonal

- Zonal pricing would create **new price risks** for some market participants
- **Highly complex implementation** would include building for both zonal self-dispatch and central dispatch
- Potential for **inefficient allocation of interzonal capacity** at different timeframes, leading to higher consumer cost

Are the key features of the hybrid scheduling models clear?

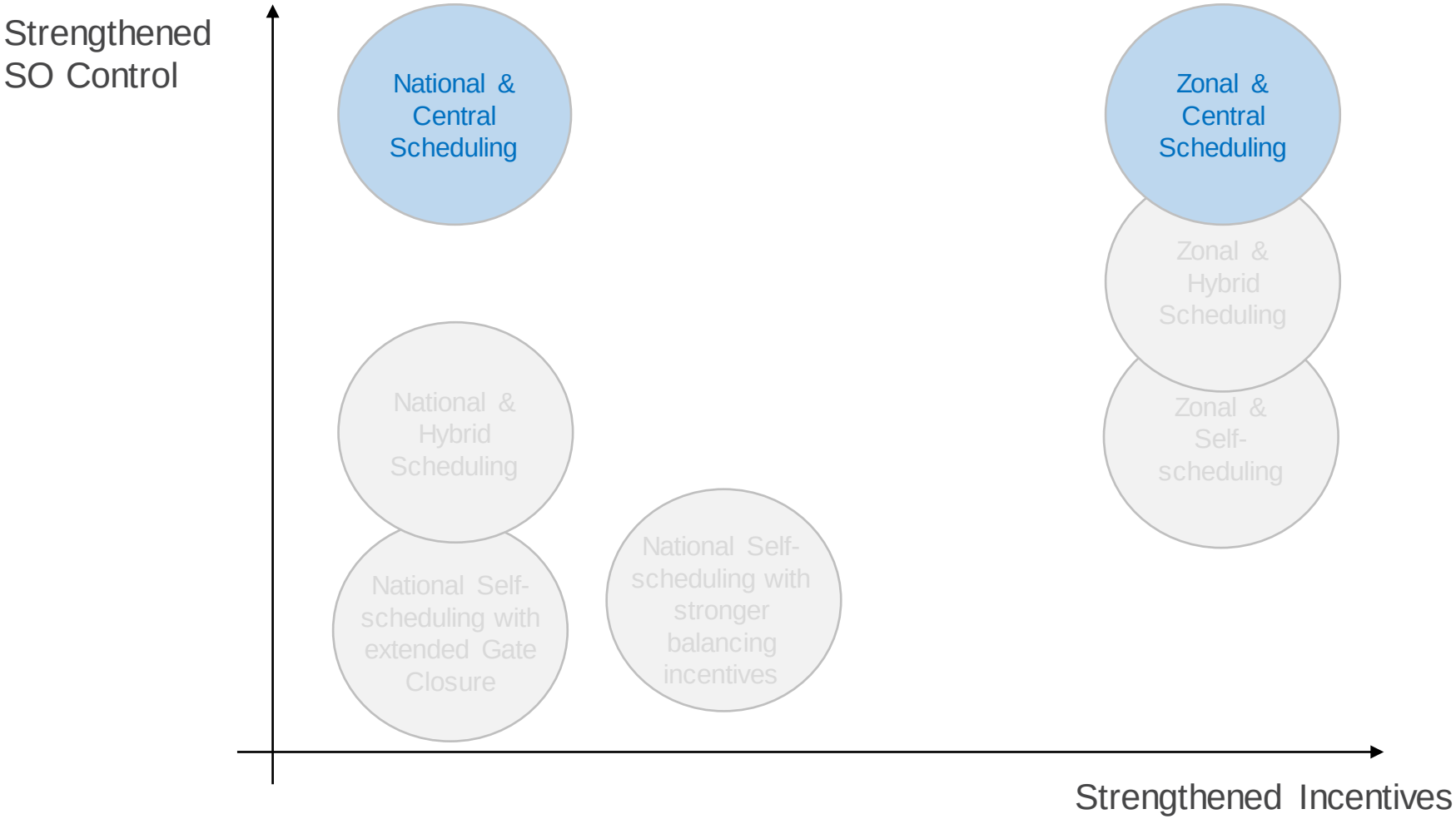
Break out 2: Hybrid scheduling

Do you agree with the hypothesised pros and cons we have identified so far? What else should we be considering?

Which ones do you think are the most important for the REMA objectives?

Model 3: Central scheduling

This section discusses the central-scheduling models



National Model 3 – Central Scheduling with Gross Pool

Key features of this model

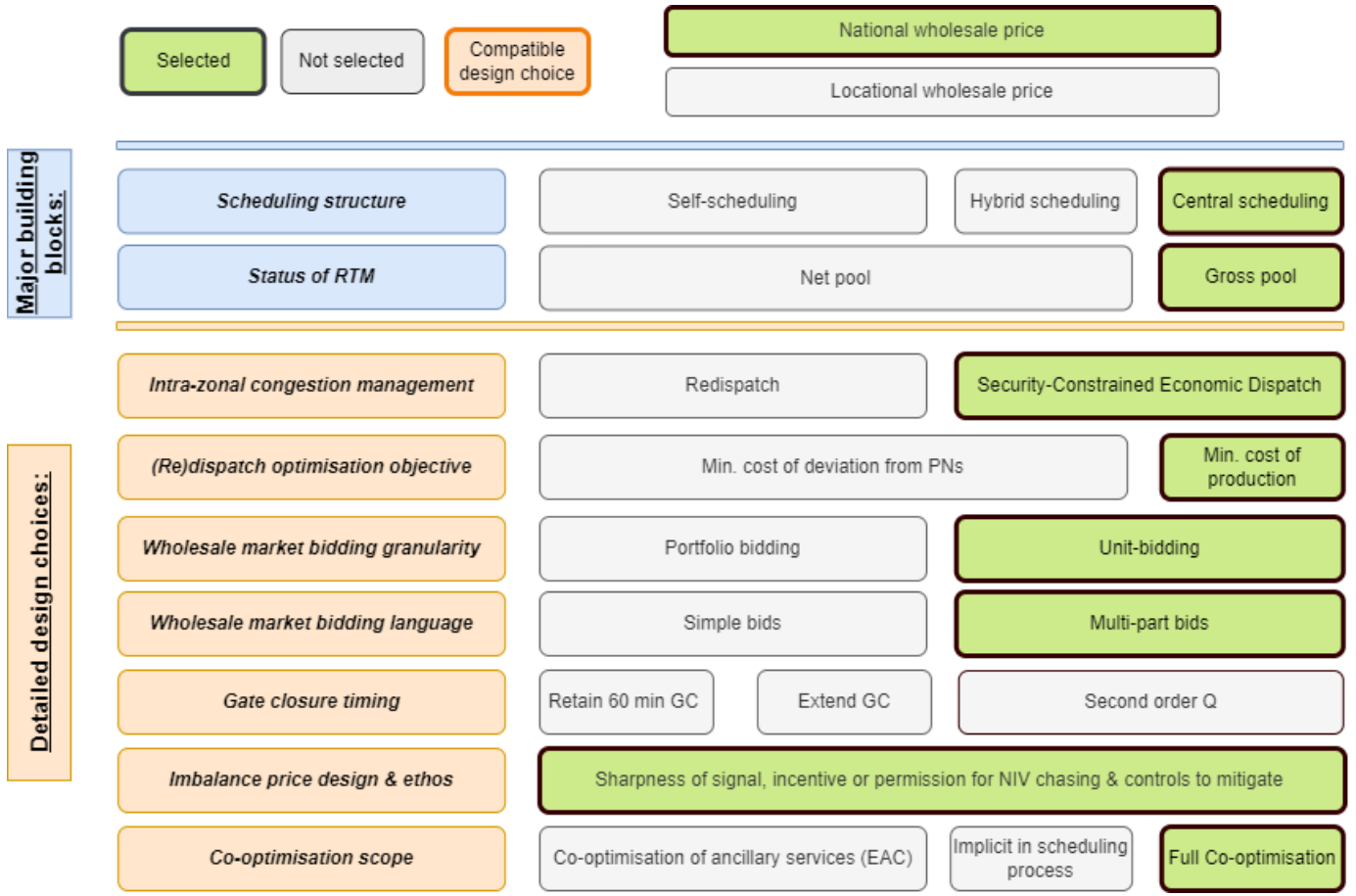
- All scheduling and dispatch decisions would be derived by the central optimisation which intends to maximise social welfare through full co-optimisation

What are the significant changes vs today?

- Introduce central dispatch algorithm to establish the market schedule and to inform redispatch decisions
- Introduction of central SO/MO entity that operates the day-ahead, real-time, and potential intraday markets
- Introduce full co-optimisation of energy and ancillary services

What are the key changes for how market parties trade, compared to today?

- **Change to contracting:** Replacement of OTC physical forward trades with financial hedges for trading before DA and ID
- **Bidding and settlement:** Submit unit level, multi-part bids for wholesale transactions; and settlement at unit level
- **Intraday trade:** Replace intraday continuous market with day-ahead and potentially intraday auctions



Zonal Model 3 – Central Scheduling with Gross Pool

Key features of this model

- All scheduling and dispatch decisions would be derived by the central optimisation which intends to maximise social welfare through full co-optimisation

What are the significant changes vs today?

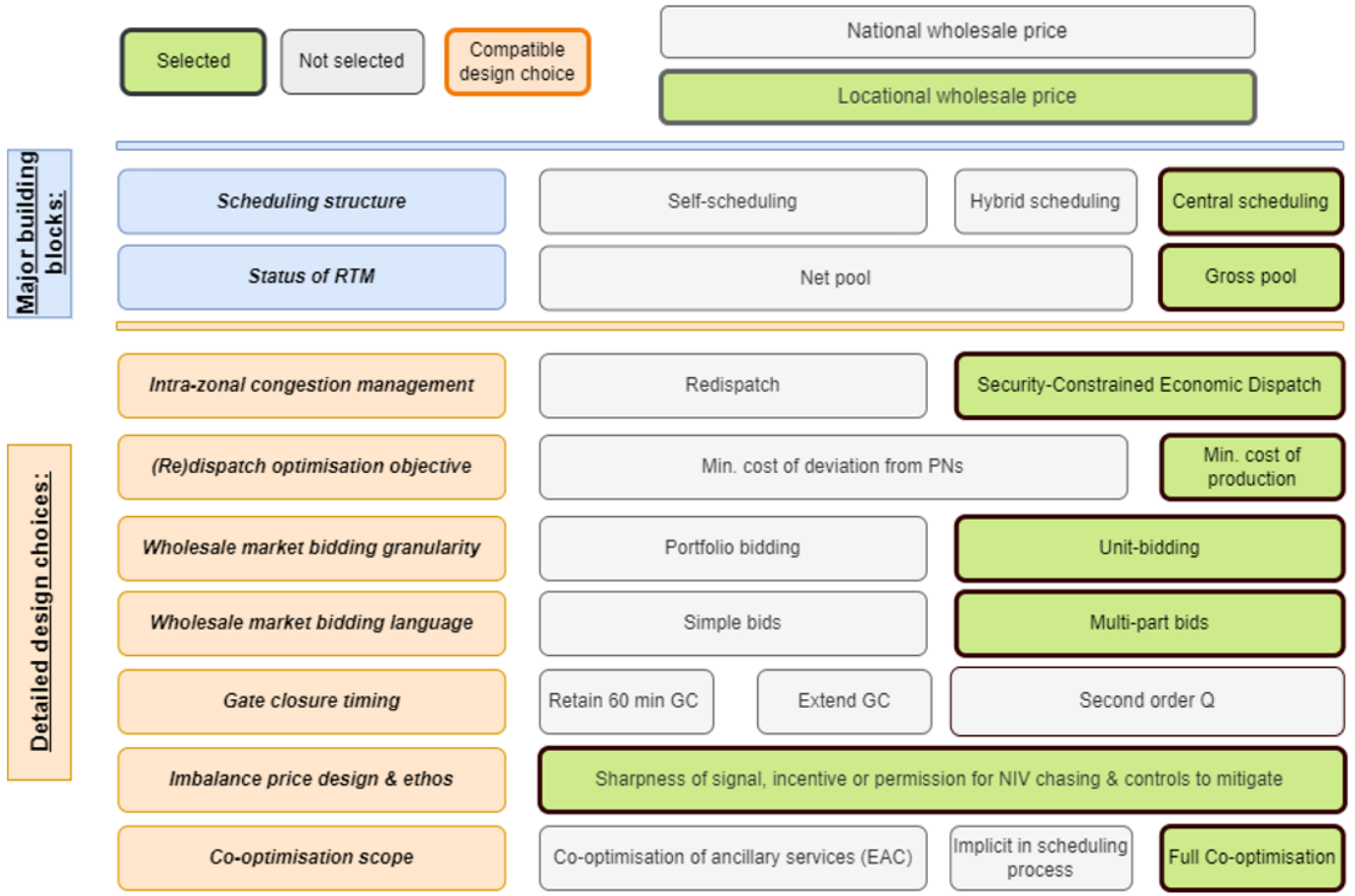
In addition to changes under national pricing:

- Settlement is at a zonal rather than national basis

What are the key changes for how market parties trade, compared to today?

In addition to changes under national pricing:

- **Price risk:** Need to manage potential changing price differences between zones in forward and spot markets



Summary of Hypothesised Pros and Cons

Model 3
Central-scheduling

National 3

Zonal 3

Pros

Both models

- Central dispatch schedules market accounting for network and intertemporal constraints, improving operational efficiency via **avoided redispatch**
- SO operated DA market would incentivise **effective information sharing** between market and SO for scheduling, supporting better dispatch
- Co-optimisation of energy, transmission capacity and ancillary services could deliver **more efficient allocation of resource** between markets
- **Unit-level bidding** could support **a level playing field** between smaller and larger market participants
- Move from continuous intraday trading to **auctions would pool liquidity** and ensure **least-cost assets are cleared** rather than faster traders

Zonal

- Better **alignment of pricing and dispatch** would **drive consumer value** by reducing "make whole" payment volumes
- Zonal pricing could **reduce the scope for market power exploitation** by providing consistent price signals over different timeframes
- **Accurate boundary definition** could **mitigate the risk of perverse bidding** incentives, enhancing market efficiency

Cons

Both models

- Highly **complex implementation** could expose market parties to delivery risk
- A move from physical to financial trading could **change** market party **collateral requirements,** creating transition risk and potential higher costs
- **Managing fixed costs** through multi-part bidding could require pricing adjustments which create gaming opportunities
- Mismatch between status of GB and bordering trade may **expose cross-border market players to new risks** and add implementation challenges
- Unit-level bidding may **reduce flexibility for portfolio players**

National

- **'Redispatch'** payments would be required to compensate constrained-off units, impacting consumer value for money, assuming firm access retained
- Removing firm access would risk **perverse bidding incentives,** impacting overall efficiency

Zonal

- Zonal market would create **new price risks** for some market participants

Make whole payments allow market participants to recover their costs if they're scheduled to run at a loss. This would happen, for example, when a thermal unit is scheduled to run for its minimum non-zero time and the wholesale price is set by a cheaper unit during some of the running time, meaning the revenue doesn't cover the start-up and shut-down costs.

Are the key features of the central scheduling models clear?

Break out 3: Central scheduling

Do you agree with the hypothesised pros and cons we have identified so far? What else should we be considering?

Which ones do you think are the most important for the REMA objectives?


Break
Back at 16:00

Summary and Next Steps

Summary of what we've covered covered today

Introduced key concepts	• Scheduling; Dispatch; Re-dispatch • Self-, Hybrid- and Central-scheduling models • Net Pool & Gross Pool • Physical & Financial trading

Shared 7 strawman models	• Are intended to cover the spectrum of different scheduling & dispatch approaches taken across jurisdictions and/or seek to address the 'Case for Change'
	• Vary by:
	  • The strength of incentives on wholesale market parties to schedule and dispatch in line with underlying system needs
	  • The degree of SO influence over scheduling/dispatch outcomes

Asked for input on arguments for and against different models	• Your input will help us scope the range of arguments made around self, hybrid and central scheduling models

Next Steps:

1. We will publish a summary of your feedback on these strawmen and the hypothesised pros/cons on our website

2. Our next point of engagement on these models will be with the DESNZ Operability, Wholesale and Location External Expert Panel

3. We continue to evaluate how these models interact with other REMA decisions, such as potential changes to Access, Charging and CfDs

The pre-read provides further high-level timelines of each model and a summary comparison table. We have not discussed these today, but they're intended to provide further information to support industry debate going forward.

Q&A

Where can you find information and materials on our work?

Net Zero Market Reform webpage:

- Scheduling & dispatch case for change overview
- Materials from workshops we are running with industry on the Case for Change:
  - Pre-read & presentation materials
  - Workshop summary notes
- Q&A document – provides more information on the status of our assessment within DESNZ' REMA programme

ESO Market Strategy email:

- Please get in touch with any queries on our case for change material presented so far
- Share your ideas for dispatch reform options to address the identified issues

box.Market.Strategy@nationalgrideso.com