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November 2025 Response and Reserve Webinar

Locational Procurement

NESO
National Energy System Operator

Slido #1887973

Agenda

- Recap: Drivers & Key Principles
- Proposed Market Design
- Quantitative Analysis Results
- Next Steps
- Q&A

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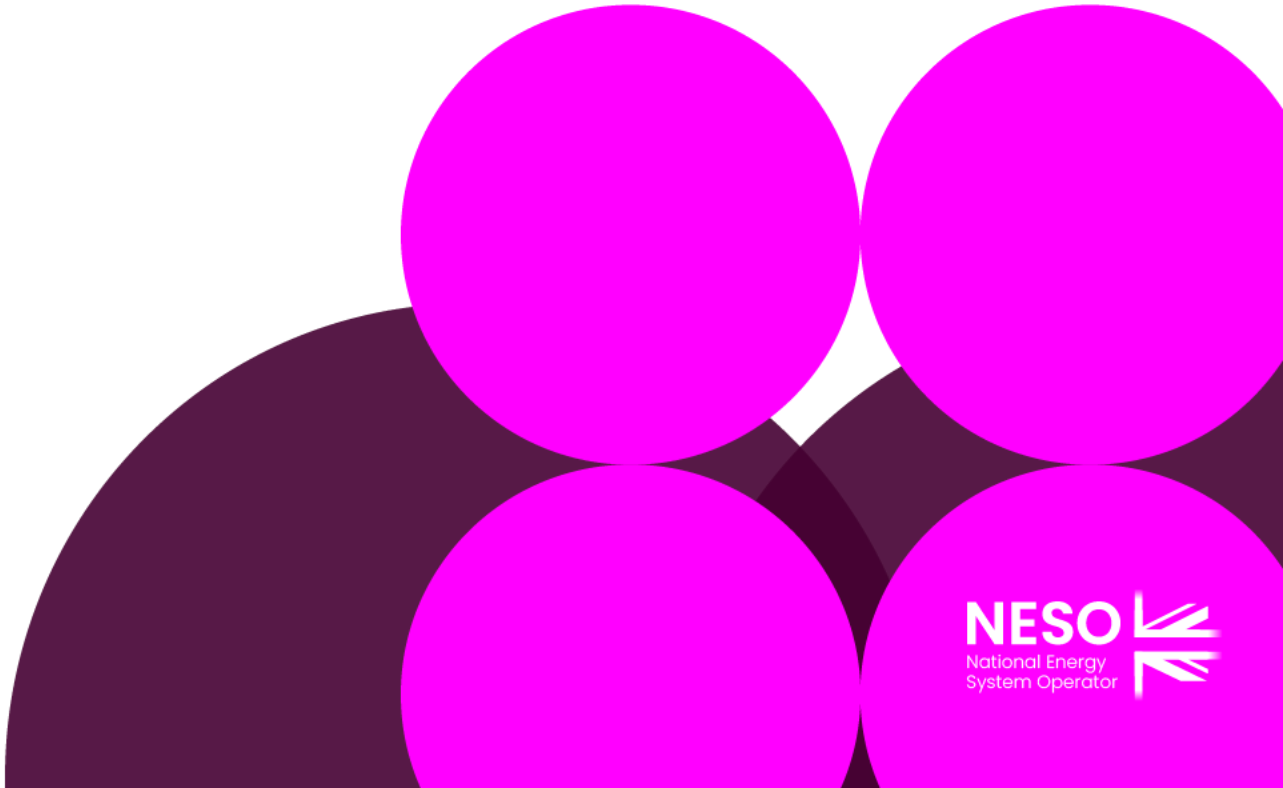
Recap

Drivers & Key Principles



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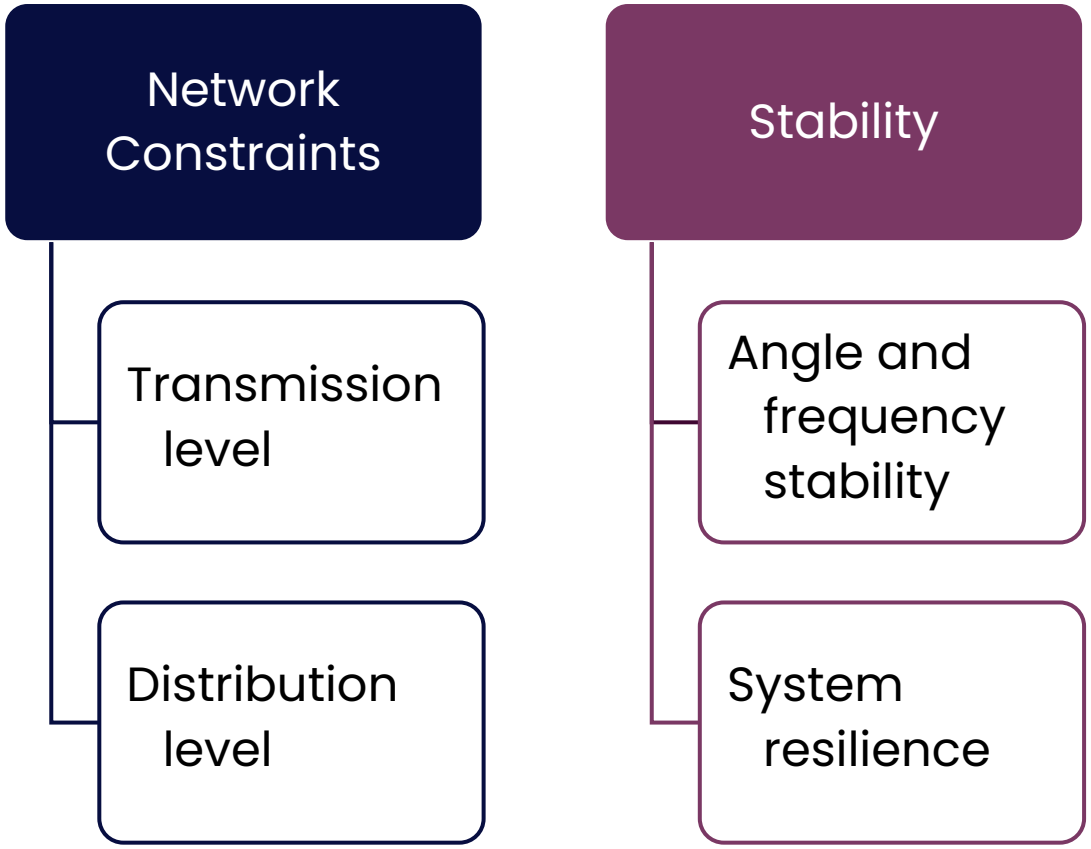
Drivers for Locational Procurement



Our goal is to incorporate details regarding the physical transmission layer into the ancillary service market, **enabling the procurement of such services where they are feasible.**

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Benefits of Locational Procurement

The expected benefits include:

Reduction of repositioning costs and actions within day.

Fewer repositioning actions reduces complexity of scheduling and dispatch processes, reducing operational risk.

Improvement to market signals in investment and dispatch timeframes.

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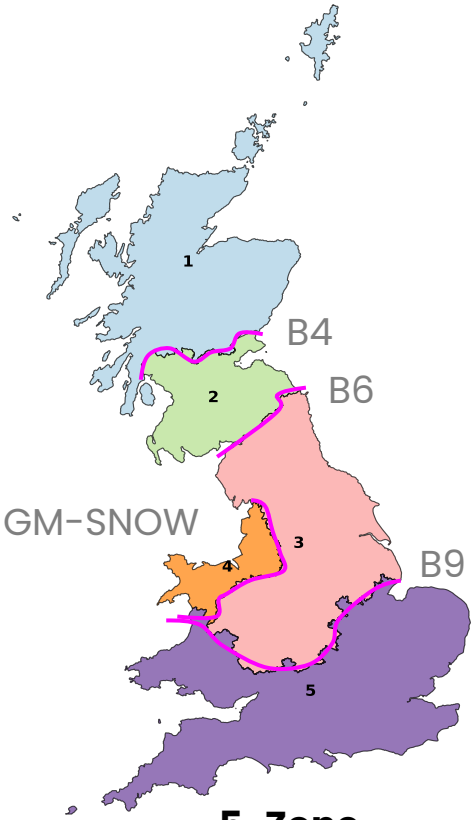
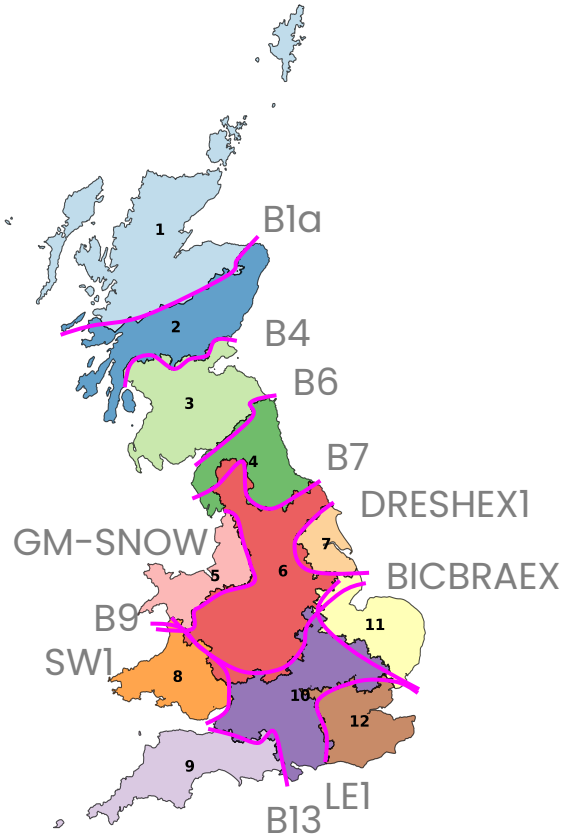
Zones & Unit Aggregation

- The following principles are followed to set the new zones:
  - **Transmission Constraint Alignment**
  - **Market Liquidity**
  - **Operational Simplicity**

- **Participants are permitted to aggregate units at the zone level.**
- Little or no change to participant's existing EAC bidding process.



5-Zone Example



12-Zone Example

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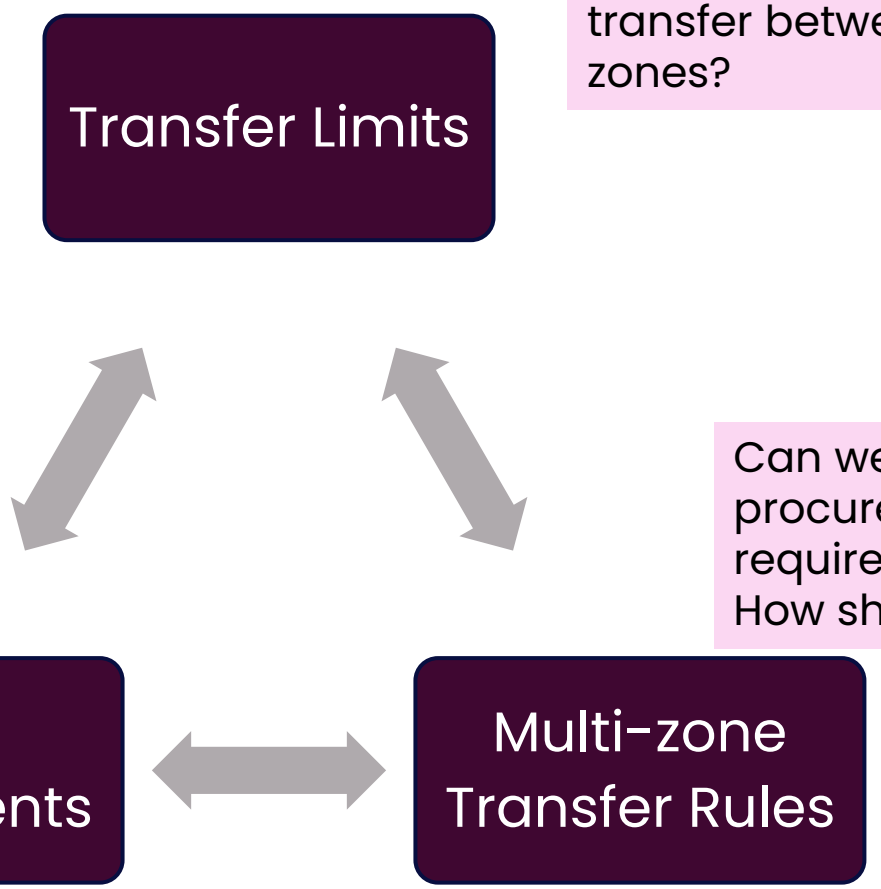
Design Building Blocks

How much can we transfer between zones?



How much do we need globally and locally per service?

Can we use service capacity procured in one zone to meet the requirements of another zone? How should this be accounted for?

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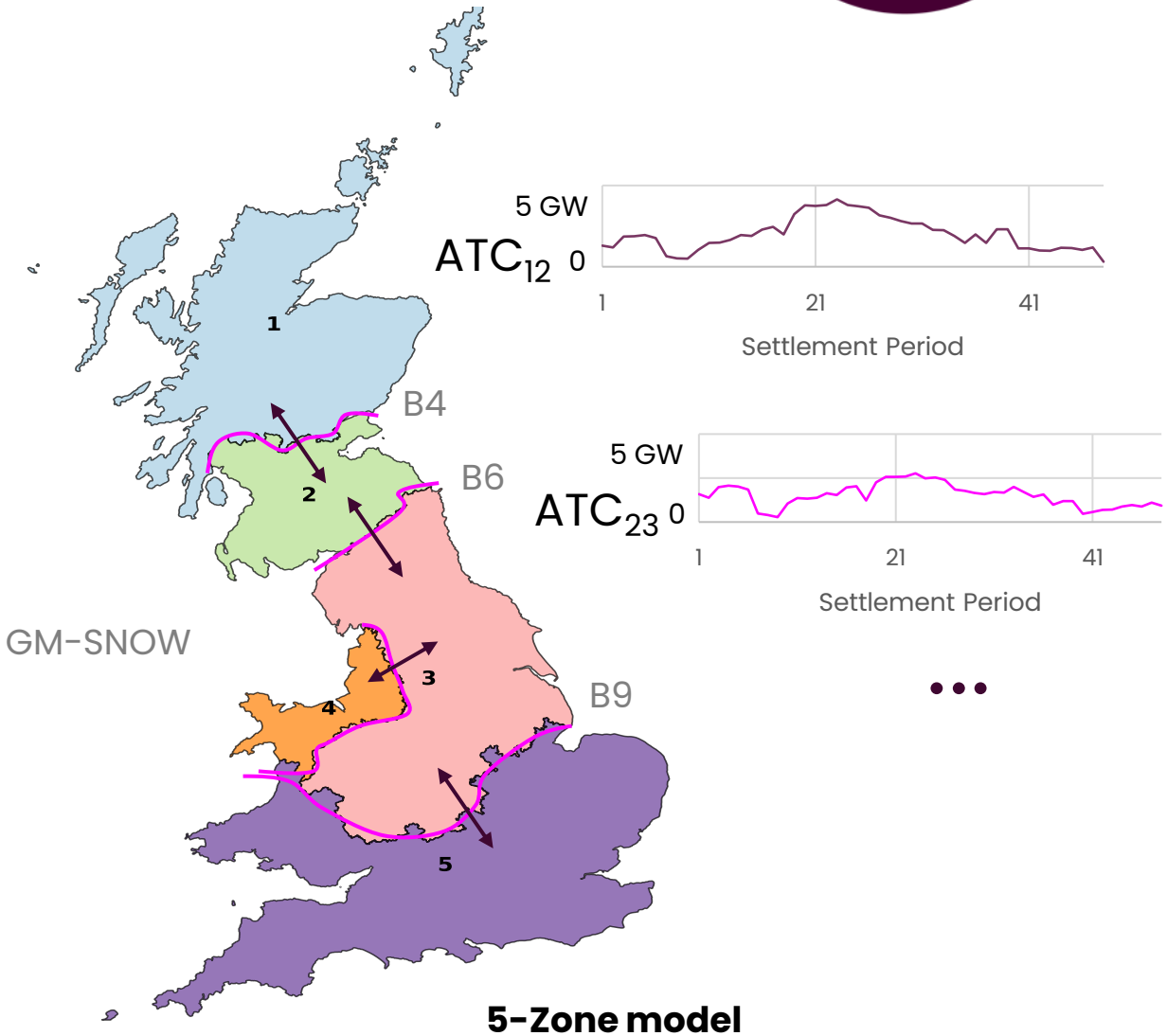
Transfer Limits

- Transfer limits are represented by Available Transfer Capacity (ATC).
- It is a time-varying estimate of the maximum allowable flow between two zones, **for the purpose of ancillary services delivery**.
- The clearing algorithm will ensure that **ATC is allocated to most valuable service (s).**



5-Zone model
For illustrative purposes

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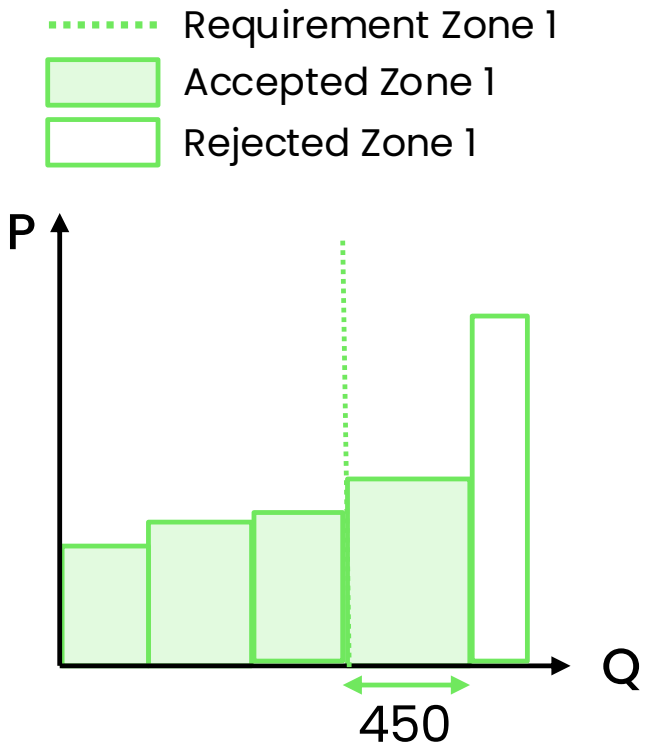
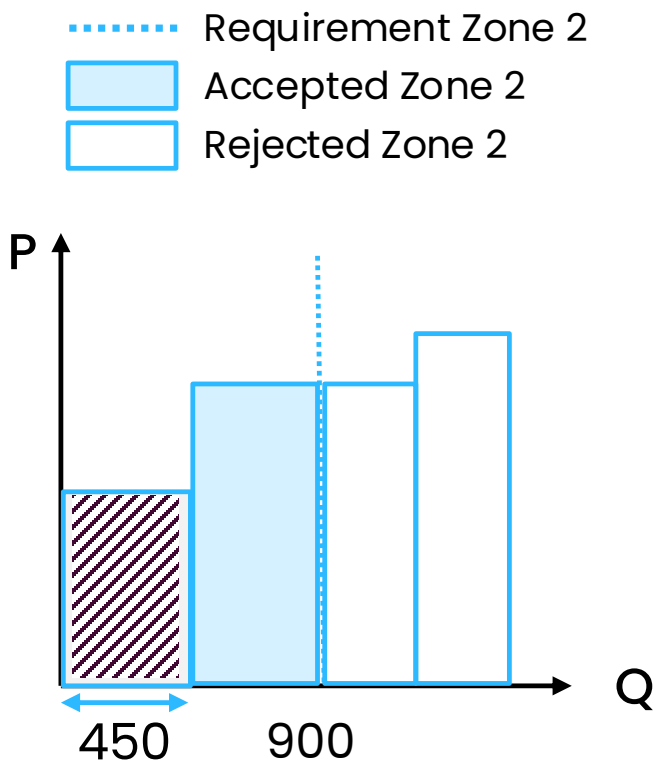
Multi-zone Transfer Rules

Exchange





Type	Zone	Quantity
Local	1	1000
Local	2	900
ATC	1-2 / 2-1	500

Total Procurement = 1900 MW

Procured from another zone

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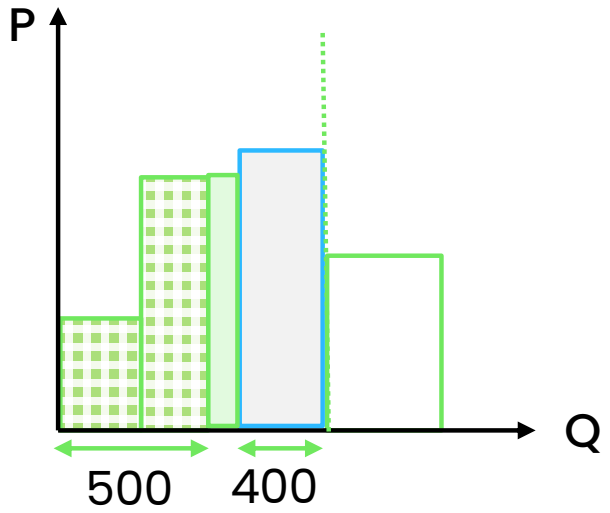
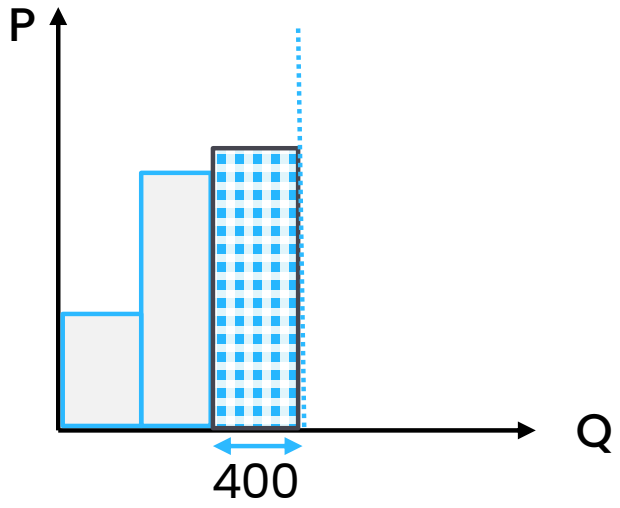
Multi-zone Transfer Rules

Sharing

Requirement Zone 1
Accepted Zone 1
Rejected Zone 1



Requirement Zone 2
Accepted Zone 2
Rejected Zone 2



Type	Zone	Quantity
Local	1	1000
Local	2	900
ATC	1-2 / 2-1	500

Total Procurement = 1000 MW

Procured from another zone
Available for Zones 1 and 2. Procured in Zone 1
Available for Zones 1 and 2. Procured in Zone 2

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Service Requirements

Auction Demand

Unlocalised Requirement	Localised Requirement
Global demand As specified today (quantity and price). No geographical considerations. Can be met by units in any zone.	**Local demand** For a particular zone. Must be met by units in the zone, or by **sharing or exchanging** of the service from units located in other zones, provided sufficient ATC. **Min/Max limits** Minimum and maximum quantities per zone or groups of zones. Must be met by units in the zone or in the group.

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Proposed Market Design

Key Design Element	Reserve	Response
Service Requirements	• **Unlocalised requirements** represented as global demand. • **Localised requirements** represented as local demand.	• **Unlocalised requirements** represented as global demand. • **Localised requirements** represented as minimum and maximum limits per zone or groups of zones.
Transfer Limits	Yes, via ATC	No
Multi-zone transfer rules	Sharing	Not Applicable

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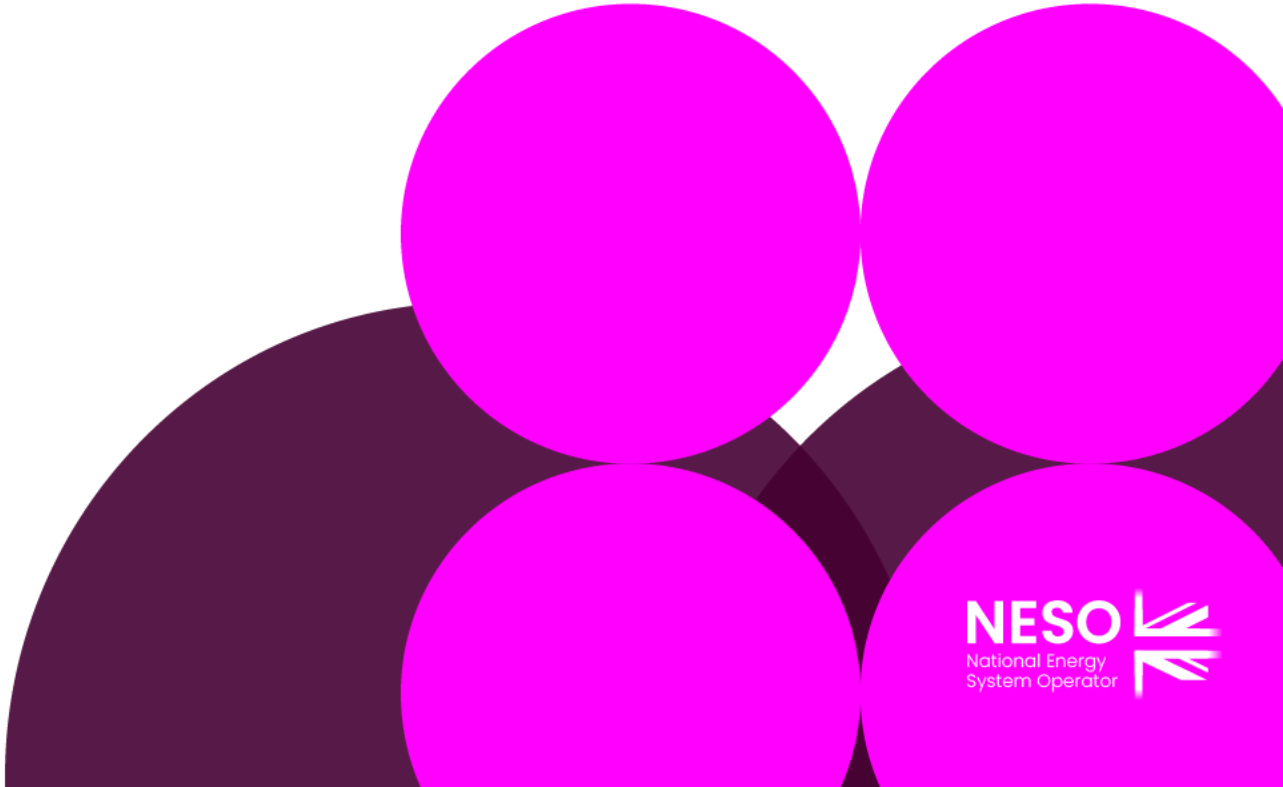
Quantitative Analysis



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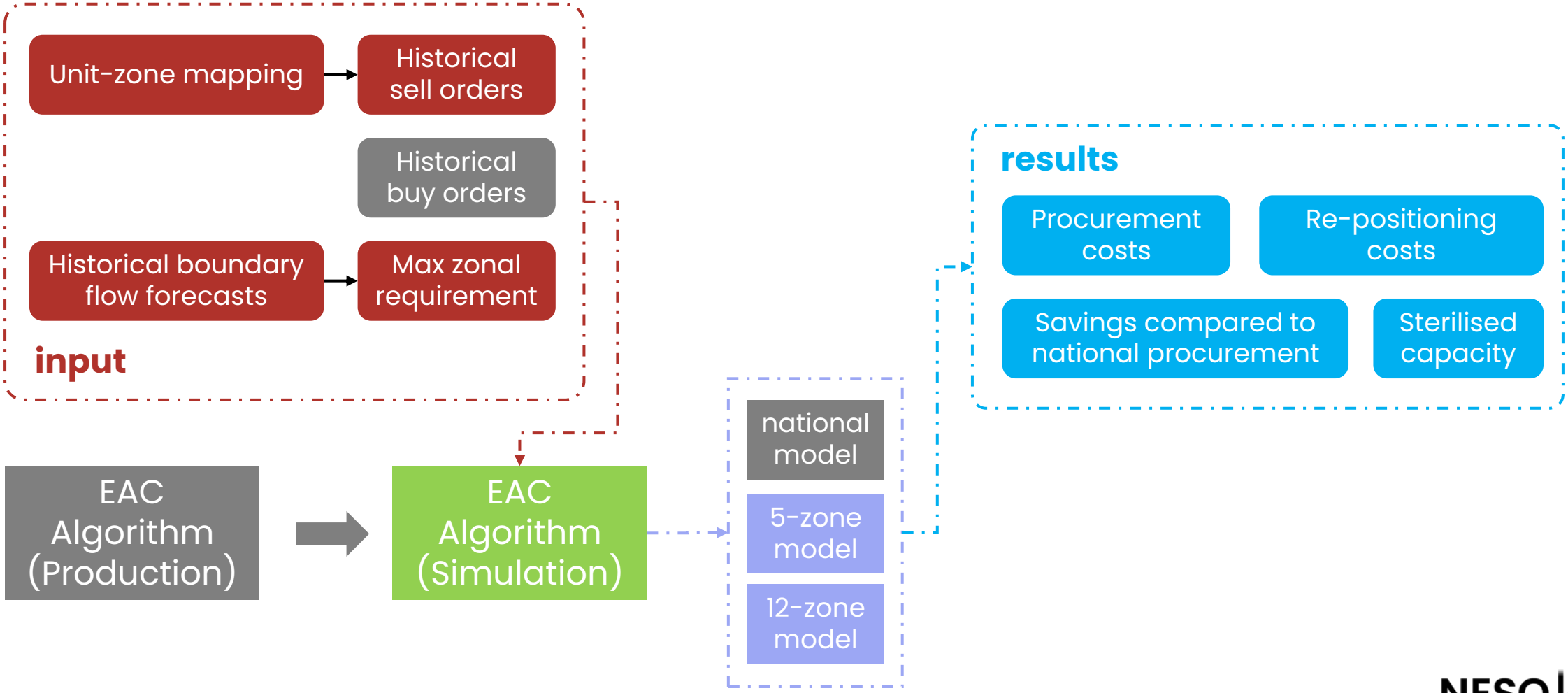
Overview



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Assumptions & Data

Service	Global	Local	Max / Min Limits
DC	✓		✓
DM	✓		✓
DR	✓		✓
BR	✓	✓	✓
QR	✓	✓	✓
SR	✓	✓	✓

- Current design
- Proposed market design
- Simulation market design

Assumptions

- National demand for all products
- Maximum local requirement for reserve products

Simulation Data

- **Sample period:** delivery days from 23 April 2024 to 4 June 2025 (405 days)
- **Services:** DC, DM, DR, BR, QR, SR
- **Scenarios:** base model (i.e., national model, 1-zone model), 5-zone model, 12-zone model

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Benefits

Benefits (£)

EAC procurement costs (<0)

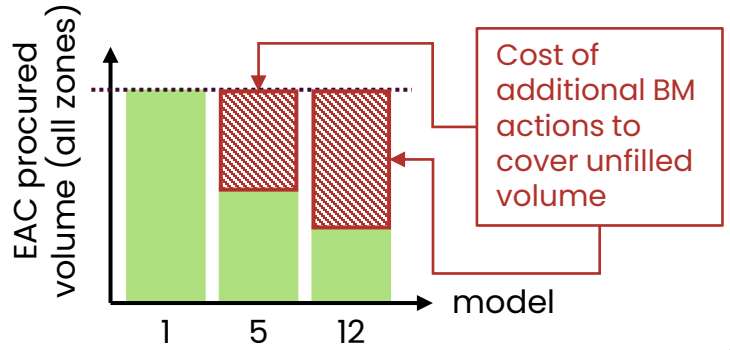
$$\sum_{n=1}^{N} clearing\ price_{zone\ n} \times cleared\ volume_{zone\ n}$$

Re-positioning costs (>0)

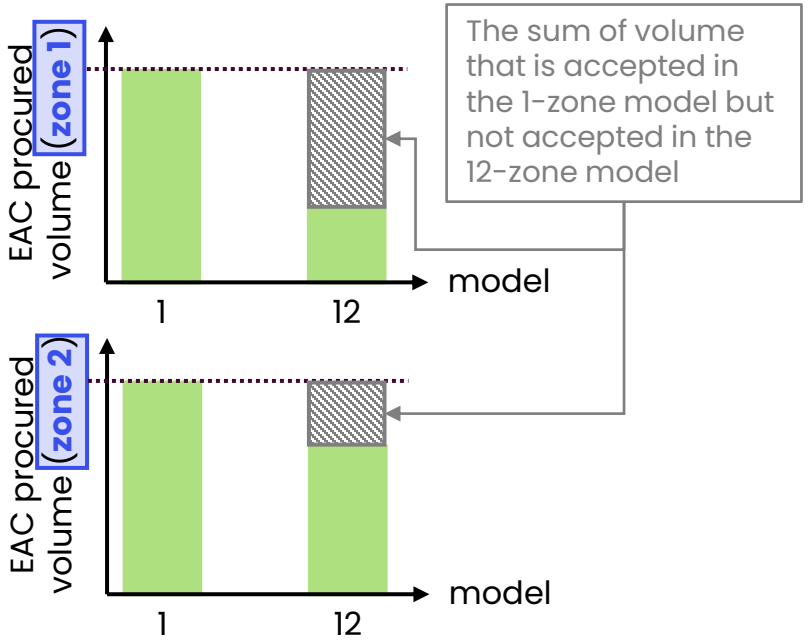
$$\sum Sterilised\ capacity \times Price\ for\ replacing\ it$$

Other costs (<0)

$$\sum Unfilled\ requirement \times Price\ for\ replacing\ it$$



Sterilised capacity



Example (national):

$$\sum_{n=1}^{N} cleared\ volume_{zone\ n}^{national} - cleared\ volume_{zone\ n}^{12-zone}$$

when $cleared\ volume_{zone\ n}^{national} \geq cleared\ volume_{zone\ n}^{12-zone}$

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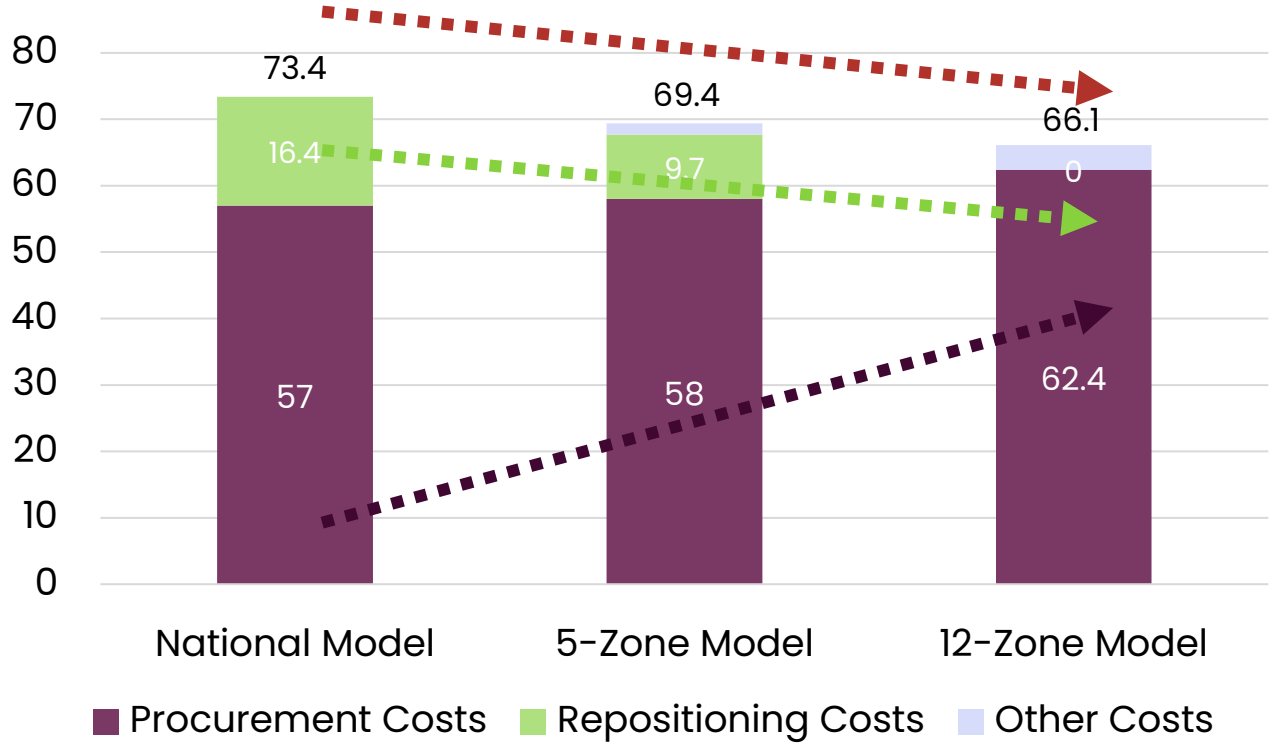
Key Results [1/2]

Annual Reserve Savings - Detailed



- Procurement costs **increase** by **£1m/£4.4m** for the 5/12-zone model
- Repositioning savings of **£9.7m/£16.4m** for the 5/12-zone model
- Net benefits of **£4m/£7.3m** per year for the 5/12-zone model

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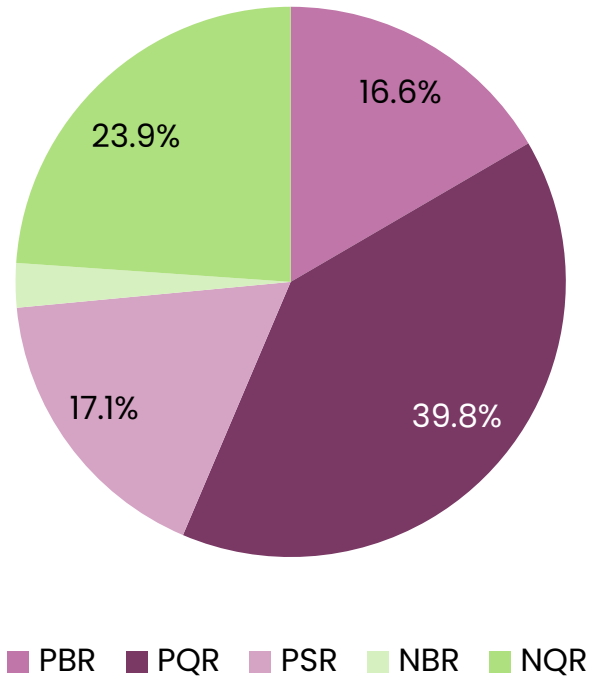
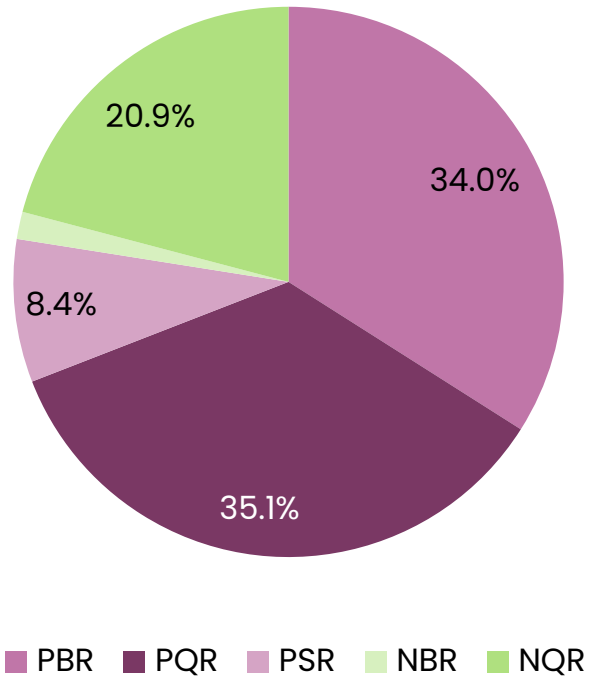
Key Results [2/2]

Annual Reserve Saving - By Product

5-Zone Model (£4m)



12-Zone Model (£7.3m)



- **70%-80%** of the **reserve savings** are linked to positive reserve due to their larger cleared volumes.
- PQR is the biggest contributor: about 35%-40% of the savings come from PQR.

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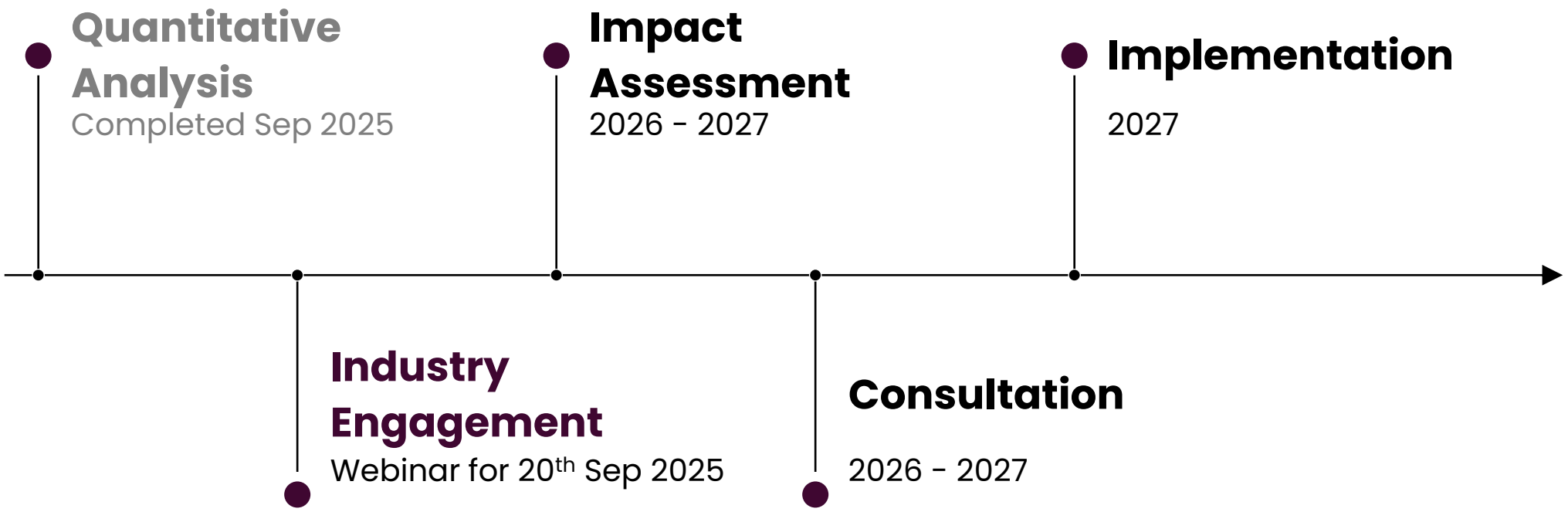
Timeline



Q&A

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