Skip Rates Behind Active Thermal Constraints

6th March 2026

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Recap of Existing Energy Method

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- Units that are inaccessible to the control room in real time are excluded from consideration.
- All system actions (including those taken to manage thermal constraints) are excluded from consideration.
- The remaining units are then assessed at a **5-minute granularity**.
- Within any 5-minute period, the total volume of energy actions made by the control room are summed (separately for bids and offers). This sum is called the **imbalance requirement**.
- All feasible volume (on units that have not been excluded) is arranged in price order, and the cheapest possible units to fulfil the imbalance requirement are deemed **in merit**.
- If a unit is in merit but was not accepted by the control room, it has been **skipped**.

Our Aim

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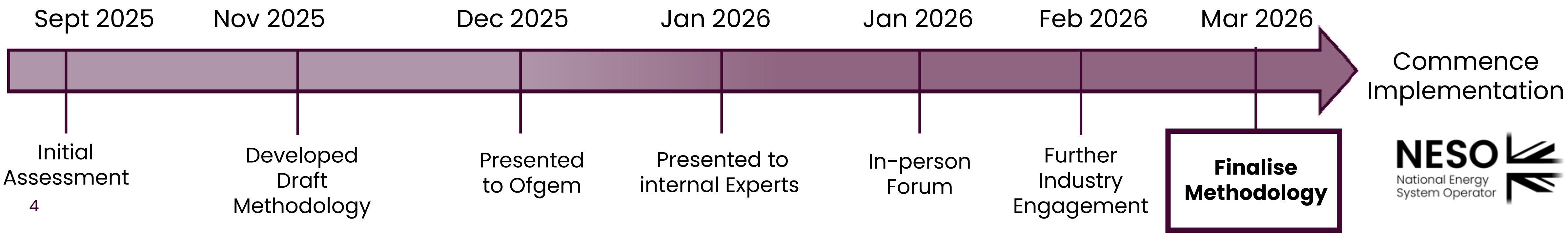
Provide transparency on dispatch decisions made for units behind active thermal constraints

Objectives

- Identify and analyse skips that occur behind thermal constraints.
- Develop a methodology to assess and measure skips within thermal constraint boundaries, accounting for:
    - Nested constraints
    - Complimentary constraints

Timeline



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You said

We did

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What granularity will the data be published in? → We are aiming for the highest granularity possible, but must ensure this aligns with internal security measures.

Can equivalent analysis be performed on voltage and stability constraints? → Following consideration of this suggestion, this method will continue to assesses thermal constraints, however this request has been noted as a requested piece of analysis moving forward.

When will data be published? → We aim to publish data in summer 2026.

What format will the data be published in?

Can the published data be broken down into GSP zones?

→ We are open to feedback on potential data publication. We will survey participants during this presentation.

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The Method: Defining groups

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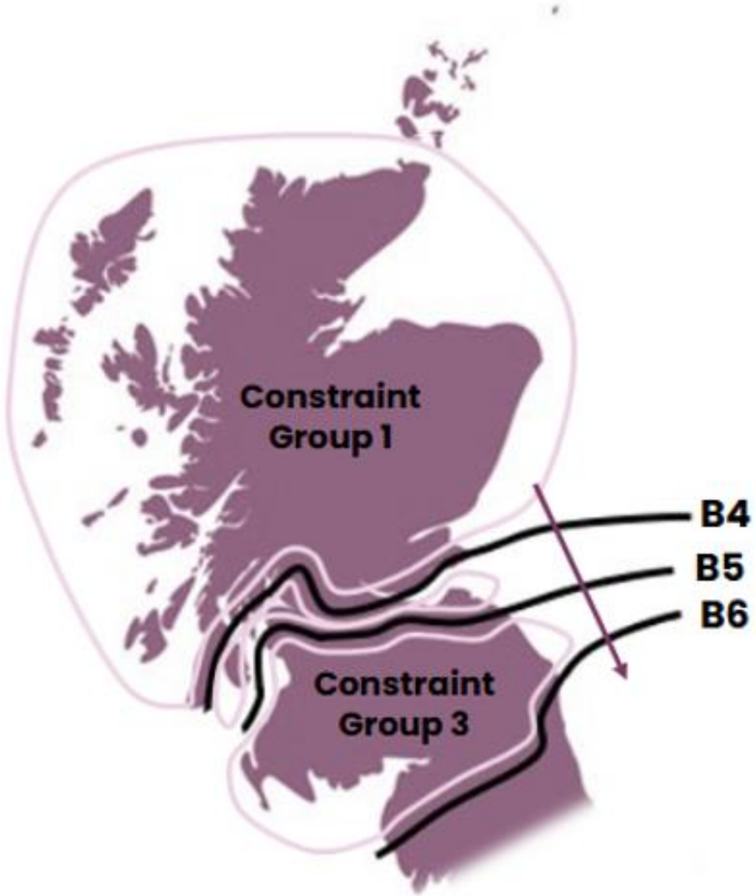

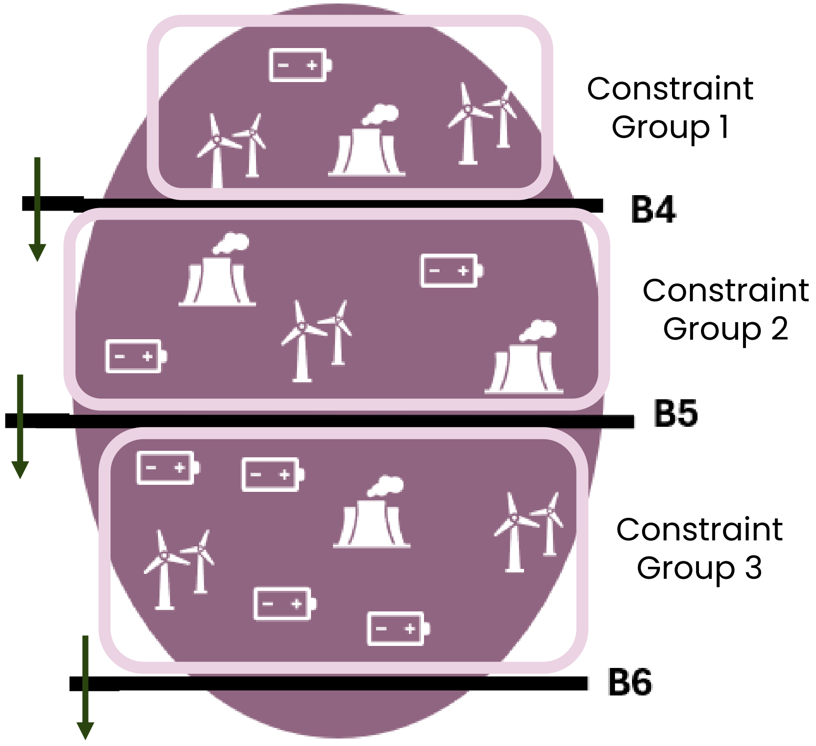

The boundary of a group is the **largest shape** you can draw without crossing any **active constraints**.

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What is an active constraint?

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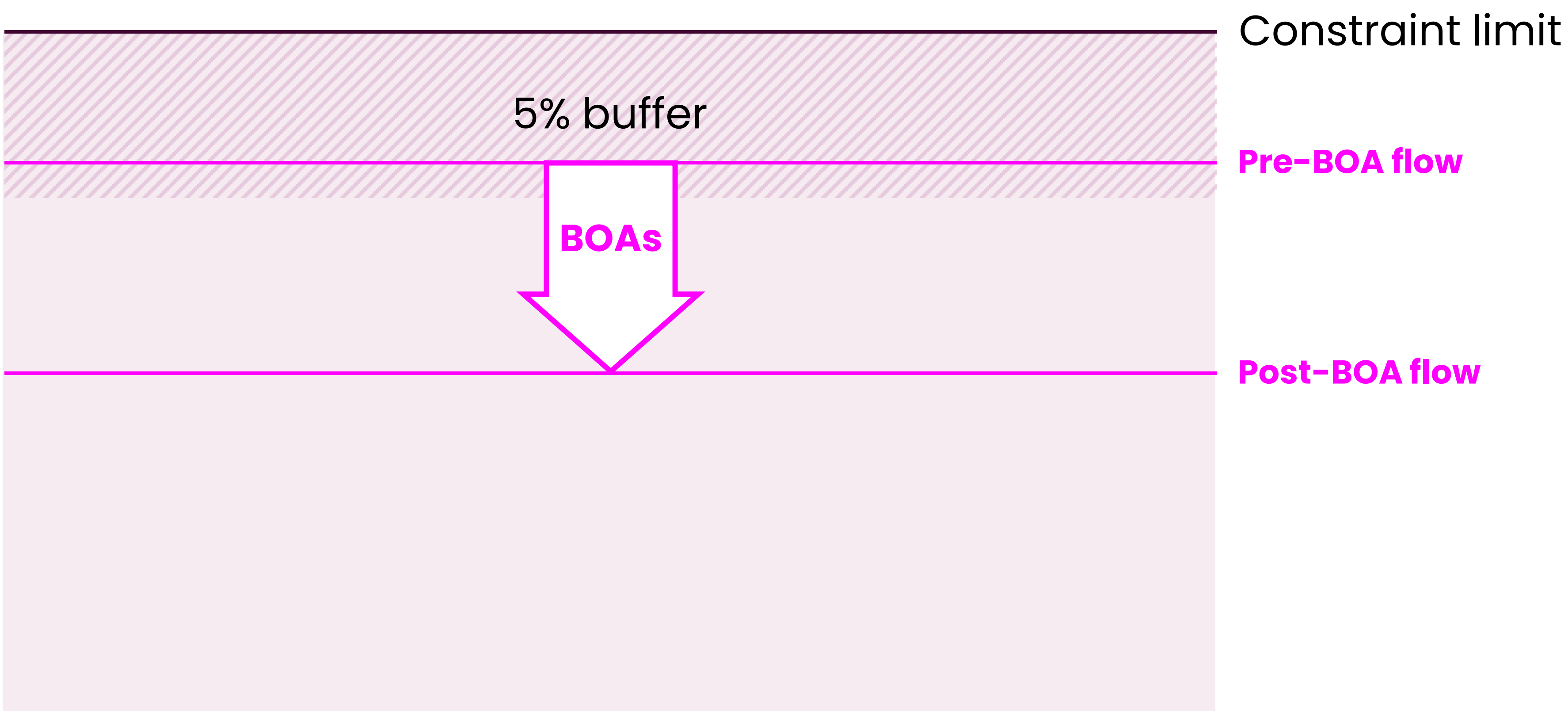

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The Method: An Overview

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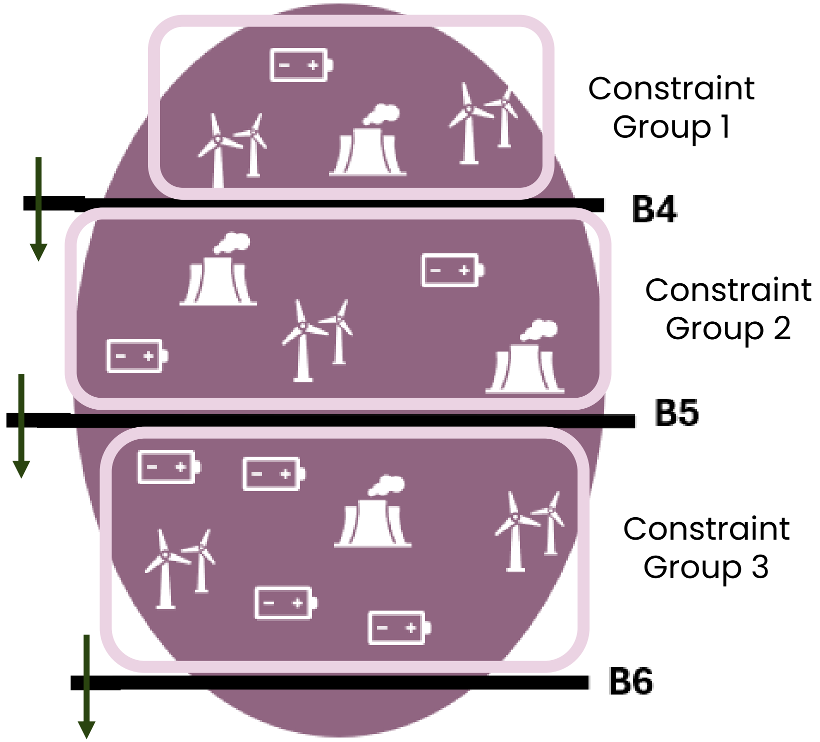
The following method is applied at a **5-minute granularity** within individual groups, and separately for bids and offers. Only bids are considered behind export constraints and only offers are considered behind import constraints.

1. All feasible volume inaccessible to the control room is excluded from the analysis.
2. The total system volume of bids/offers accepted by the control room within the given group is calculated (the group imbalance requirement)
3. The cheapest feasible volume that could have fulfilled the group imbalance requirement is deemed 'in merit.'
4. Any volume deemed in merit but not accepted by the control room is considered skipped.



Assumption: All available generators have the same effectiveness in managing constraints.

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Nested Constraints

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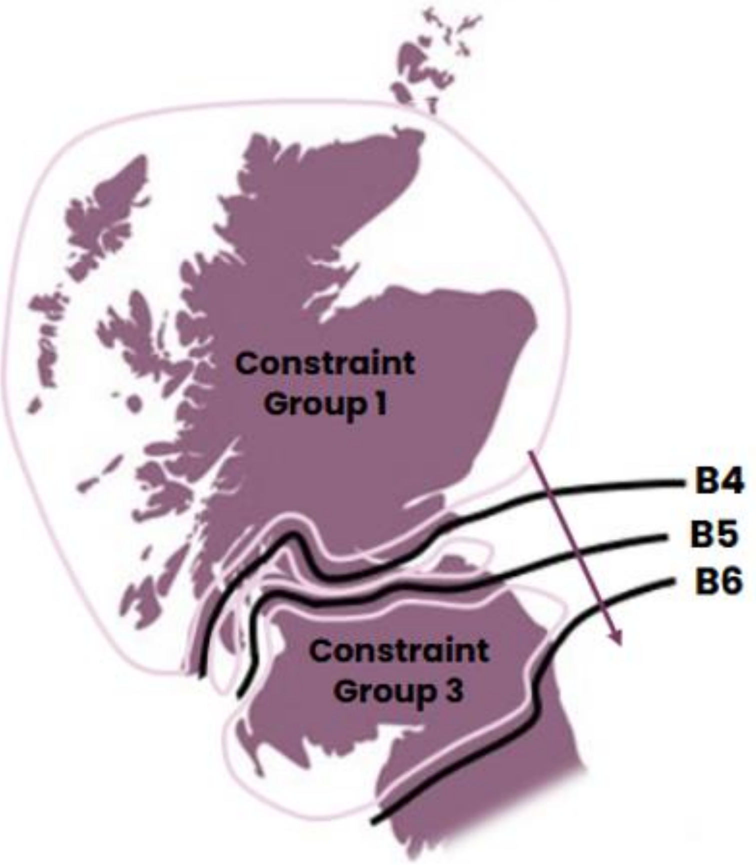
- Nested constraints are more complex, as actions taken to affect one constraint boundary may affect others.
- The example to the right shows three nested export constraints.
- Any actions taken in constraint group 1 to manage B4 also affects both B5 and B6.
- Similarly, any actions taken in constraint group 2 to manage B5 also affects B6.
- This is true whether nested constraints are import, export, or mixed.



The Method – Nested Groups

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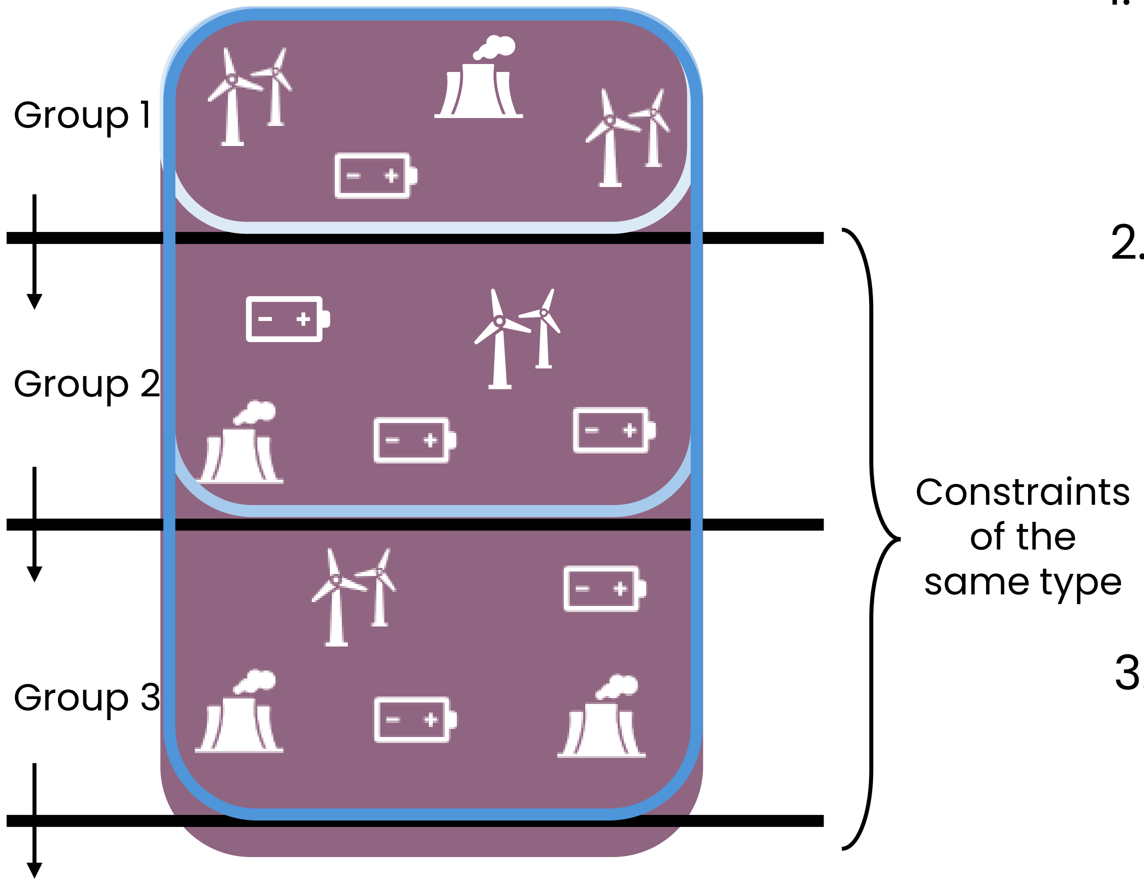

1. Calculate the skipped volume in the most constrained group as normal. (The most constrained group is the group behind the highest number of active constraints).
2. Calculate the skipped volume in the 2nd most constrained group:
   - Calculate the imbalance requirement using only units in group 2.
   - Create the feasible merit stack from all feasible volume in group 2, and any remaining volume in group 1.
3. Repeat the process with the next most constrained group in the same way:
   - Calculate the imbalance requirement using only units in group 3.
   - Create the feasible merit stack from all feasible volume in group 3, and any remaining volume in groups 1 and 2.

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The Method – Mixed Nested Groups

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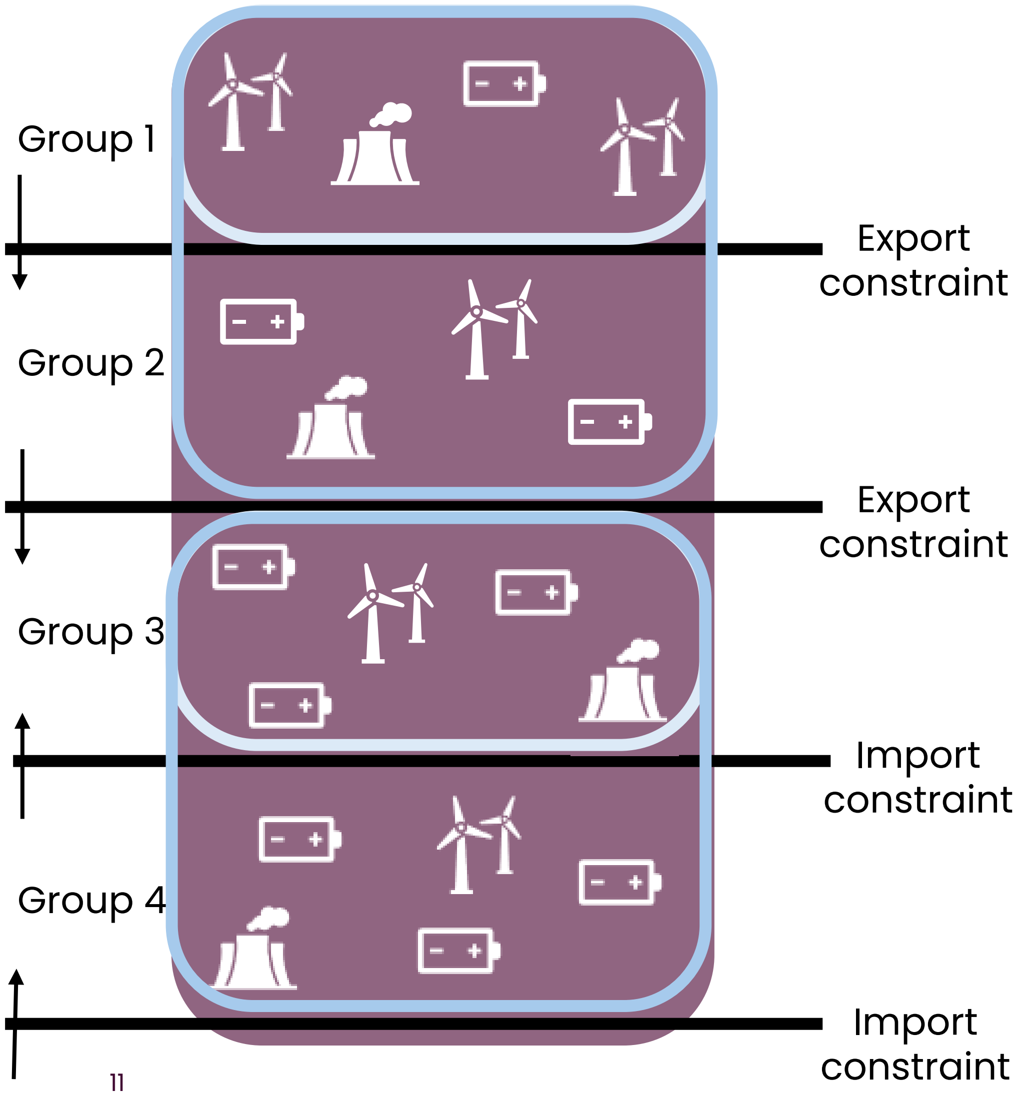

1. As before, begin with the most constrained group.
2. As before, calculate the skipped volume in the 2nd most constrained group:
   - The imbalance requirement is the sum of accepted volume in group 2
   - The feasible merit stack is formed from all feasible volume in group 2, and all remaining feasible volume in group 1.
3. Group 3 is behind a different type of constraint to the previous ones, so the 'looping' must start again.
4. Group 4 is behind the same type of constraint as group 3, so they are considered together.
   - The imbalance requirement is the sum of accepted volume in group 4
   - The feasible merit stack is formed from all feasible volume in group 4, and all remaining feasible volume in group 3

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Example: Nested Export Constraints

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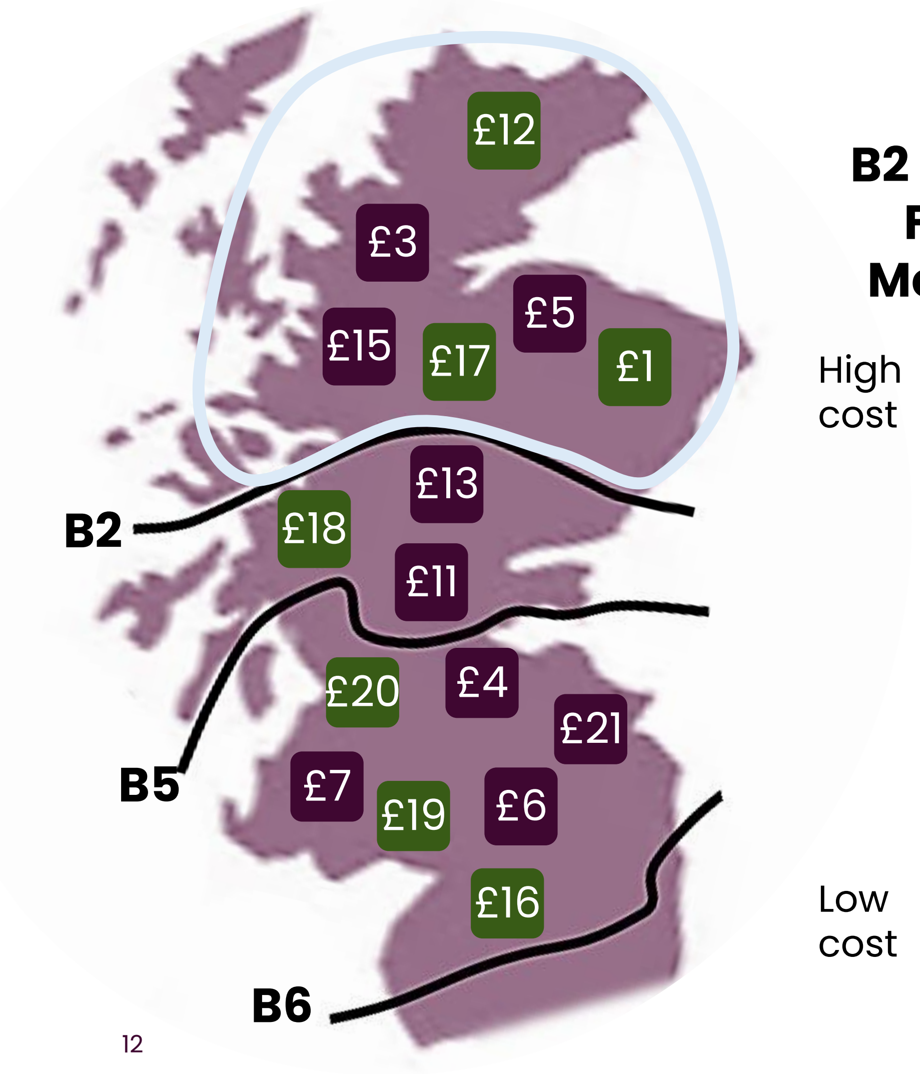
Costs represent cost to NESO



B2 Boundary Feasible Merit Stack

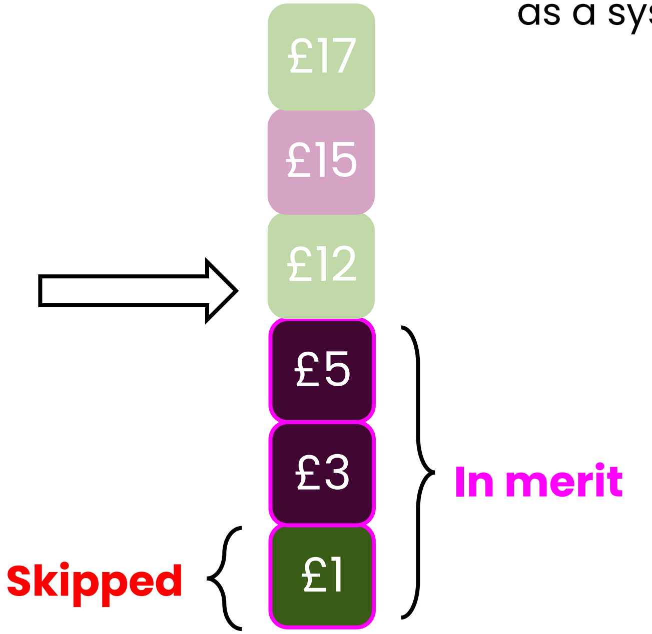
High cost

£17
£15
£12
£5
£3
£1

Low cost

+

B2 group imbalance requirement = 3 MWh



Key:

- Feasible bid of 1MWh - not accepted by the control room
- Feasible bid of 1MWh - accepted by the control room as a system action

This example is simplified for illustrative purposes, and the positive cost values represents cost to NESO. The simplification does not change the underlying logic of how in-merit and skipped volumes are identified.

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Example: Nested Export Constraints

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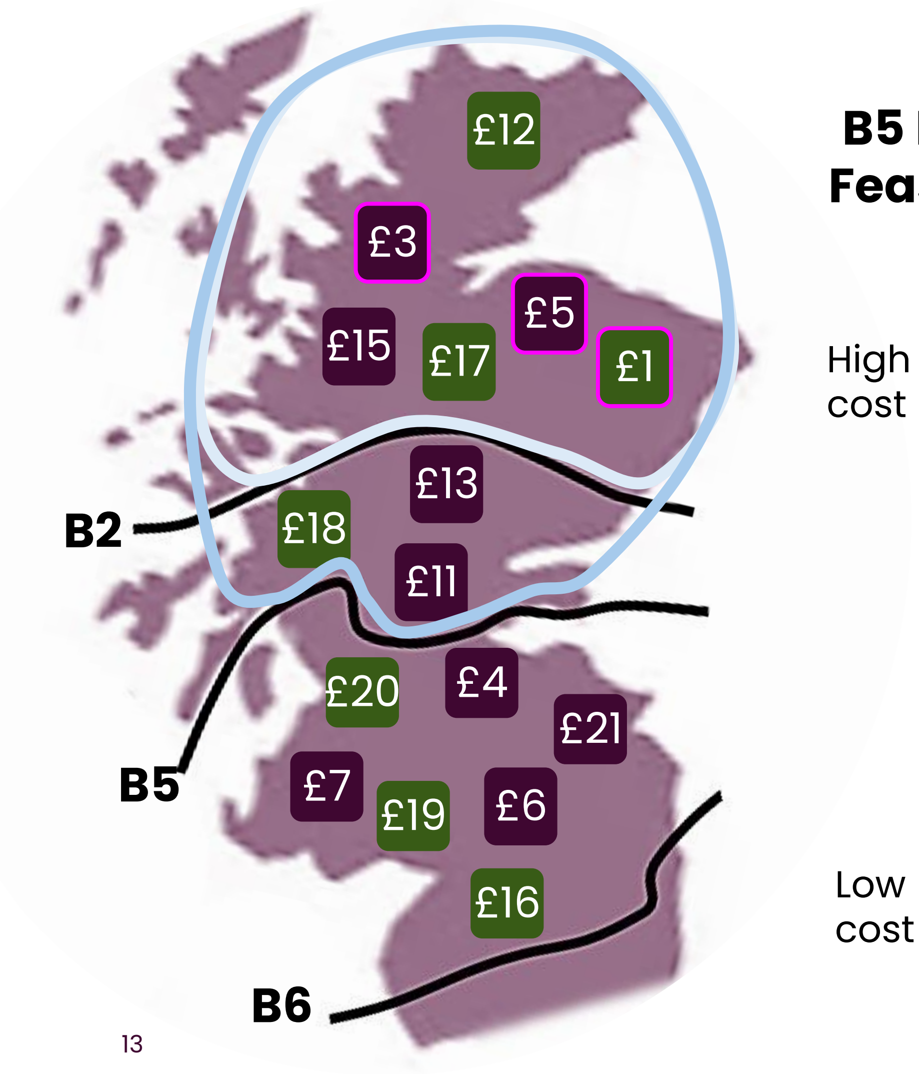
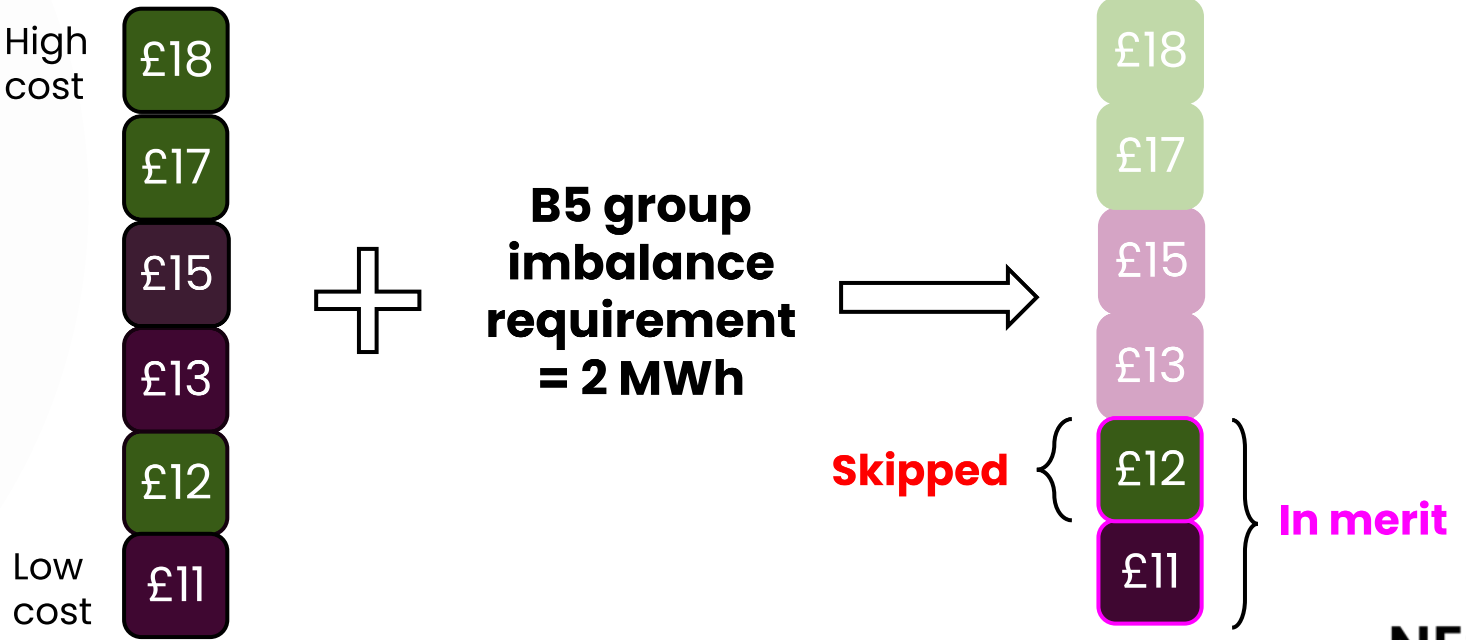


B5 Boundary Feasible Merit Stack



Key:

- Feasible bid of 1MWh - not accepted by the control room
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Example: Nested Export Constraints

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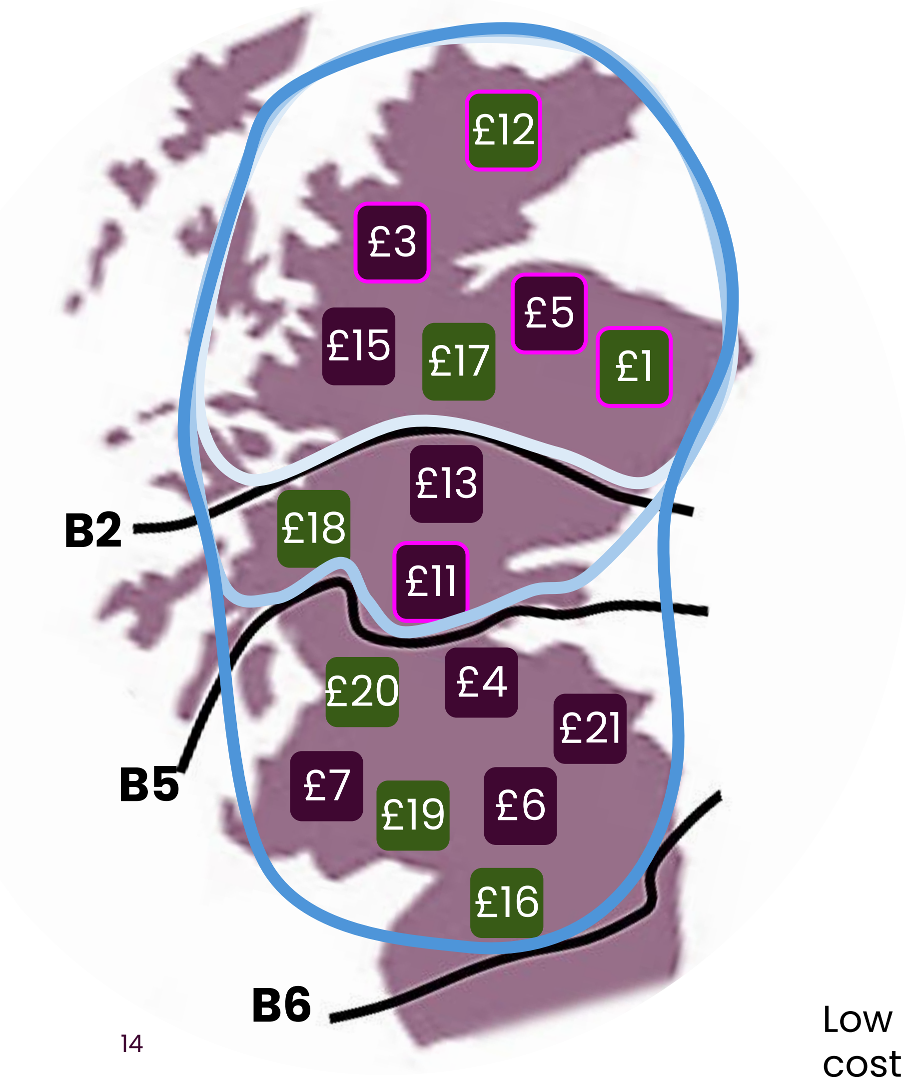
Costs represent cost to NESO

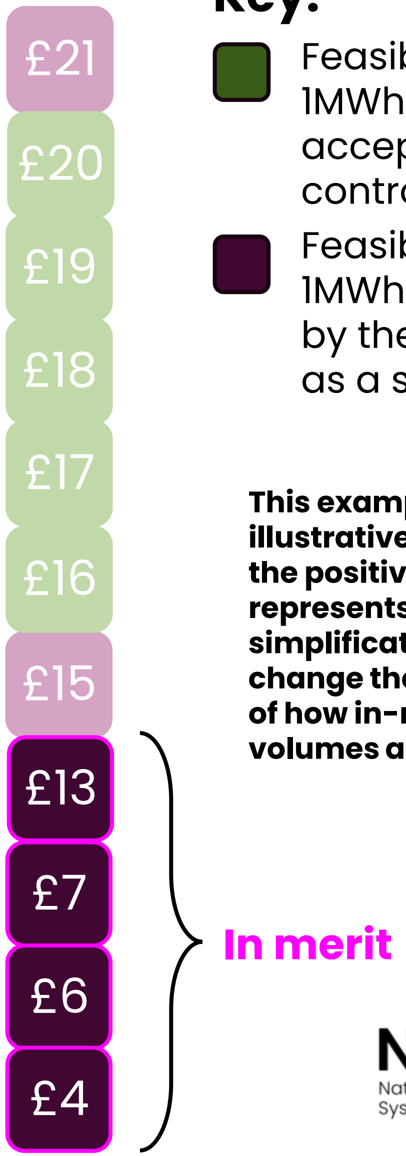


High cost

Low cost

B6 Boundary Feasible Merit Stack

+ B6 group imbalance requirement = 4 MWh



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Example: Nested Export Constraints

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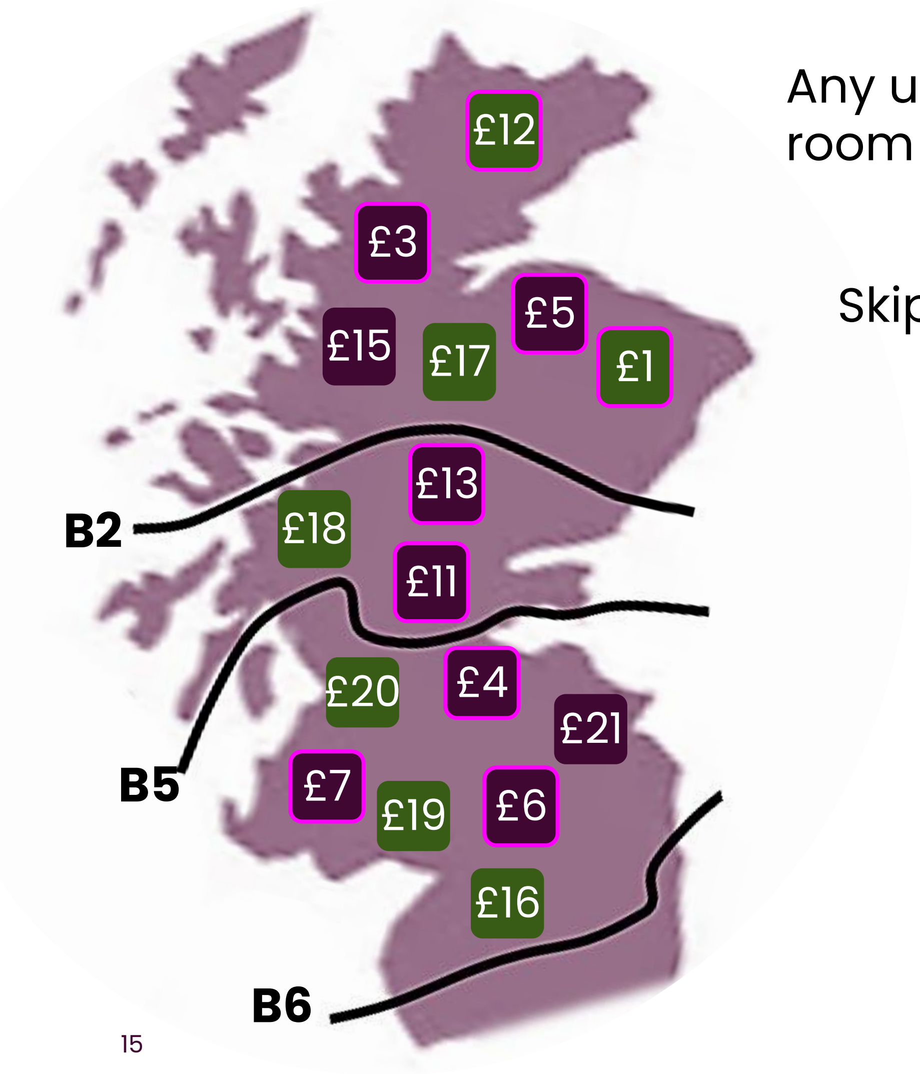
Costs represent cost to NESO



Any units in merit but not accepted by the control room are skipped

$$\text{Skip rate} = \frac{\text{Skipped volume}}{\text{Accepted volume}} = \frac{2}{9} = 22\%$$

Calculated at **5-minute granularity**

Key:

- Feasible bid of 1MWh - not accepted by the control room
- Feasible bid of 1MWh - accepted by the control room as a system action

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The Method – Exclusions

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Excluded in energy method

Exclusion	Justification
Long notice units: MZT | MNZT | NDZ >= 31min	These units are inaccessible to the control room in balancing timescales.
Offers on wind and solar units	These technology types are weather condition dependent and therefore cannot increase output.
Volumes leaving a unit in an unstable position	Instructing a unit to a level between its SIL and SEL would result in the instruction being rejected.
All units with acceptances system tagged for voltage or inertia	Although these units were accepted for system reasons, it was not to manage thermal constraints.
All units not behind active thermal constraints	Most of these actions are assessed by the existing energy method.
Units armed for Intertrip or frequency response contracts.	These units maintain a position which ensures they can deliver upon these contracts. If the control room changes their position, they must still pay for these contracts, despite the units being unable to deliver upon them.

Data Format Option: By Constraint

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Example data

Week Beginning	Constraint	Import/Export	Skip Rate (%)
2026-01-05	SCOTEX	Export	20
2026-01-05	SSHARN	Export	15
2026-01-05	GMSNOW	Export	10
2026-01-05	FLOWSTH	Export	33
2026-01-05	DRESHEX	Export	25
2026-01-05	SEIMP	Import	35
2026-01-05	ESTEX	Export	40
2026-01-12	SCOTEX	Export	21
2026-01-12	SSHARN	Export	16
2026-01-12	GMSNOW	Export	11
2026-01-12	FLOWSTH	Export	36
2026-01-12	DRESHEX	Export	28
2026-01-12	SEIMP	Import	39
2026-01-12	ESTEX	Export	42

We are not able to provide the same level of transparency as we have with the energy method due to data security, but we would like to provide as much transparency as possible. We are therefore very keen to ensure that the published data is in line with expectations and what is useful.

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Data Format Option: By BMU

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Week Beginning	BM Unit	Bid/Offer	Skip Rate (%)
2026-01-05	A	Bid	20
2026-01-05	A	Offer	15
2026-01-05	B	Bid	10
2026-01-05	B	Offer	33
2026-01-05	C	Bid	25
2026-01-05	C	Offer	35
2026-01-05	D	Bid	40
2026-01-05	D	Offer	21
2026-01-12	A	Bid	16
2026-01-12	A	Offer	11
2026-01-12	B	Bid	36
2026-01-12	B	Offer	28
2026-01-12	C	Bid	39
2026-01-12	C	Offer	42

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Data Format Option: By GSP Zone

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Example data

Week Beginning	GSP Zone	Bid/Offer	Skip Rate (%)
2026-01-05	South Wales	Bid	20
2026-01-05	South Wales	Offer	15
2026-01-05	Yorkshire	Bid	10
2026-01-05	Yorkshire	Offer	33
2026-01-05	Midlands	Bid	25
2026-01-05	Midlands	Offer	35
2026-01-05	London	Bid	40
2026-01-05	London	Offer	21
2026-01-12	South Wales	Bid	16
2026-01-12	South Wales	Offer	11
2026-01-12	Yorkshire	Bid	36
2026-01-12	Yorkshire	Offer	28
2026-01-12	Midlands	Bid	39
2026-01-12	Midlands	Offer	42

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Survey

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- This survey is the final opportunity to provide feedback on the methodology, and in particular on the data outputs, ahead of the sign-off at the end of the financial year.
- Please use the QR code to login to Slido and share your feedback

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Questions and Feedback

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Thank You

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Example

Feasible merit stack

- Calculated at a **5-minute granularity**
- Calculated for bids and offers separately
- Calculated for each group separately

Key:

Feasible volume of 1 MWh - not accepted by the control room

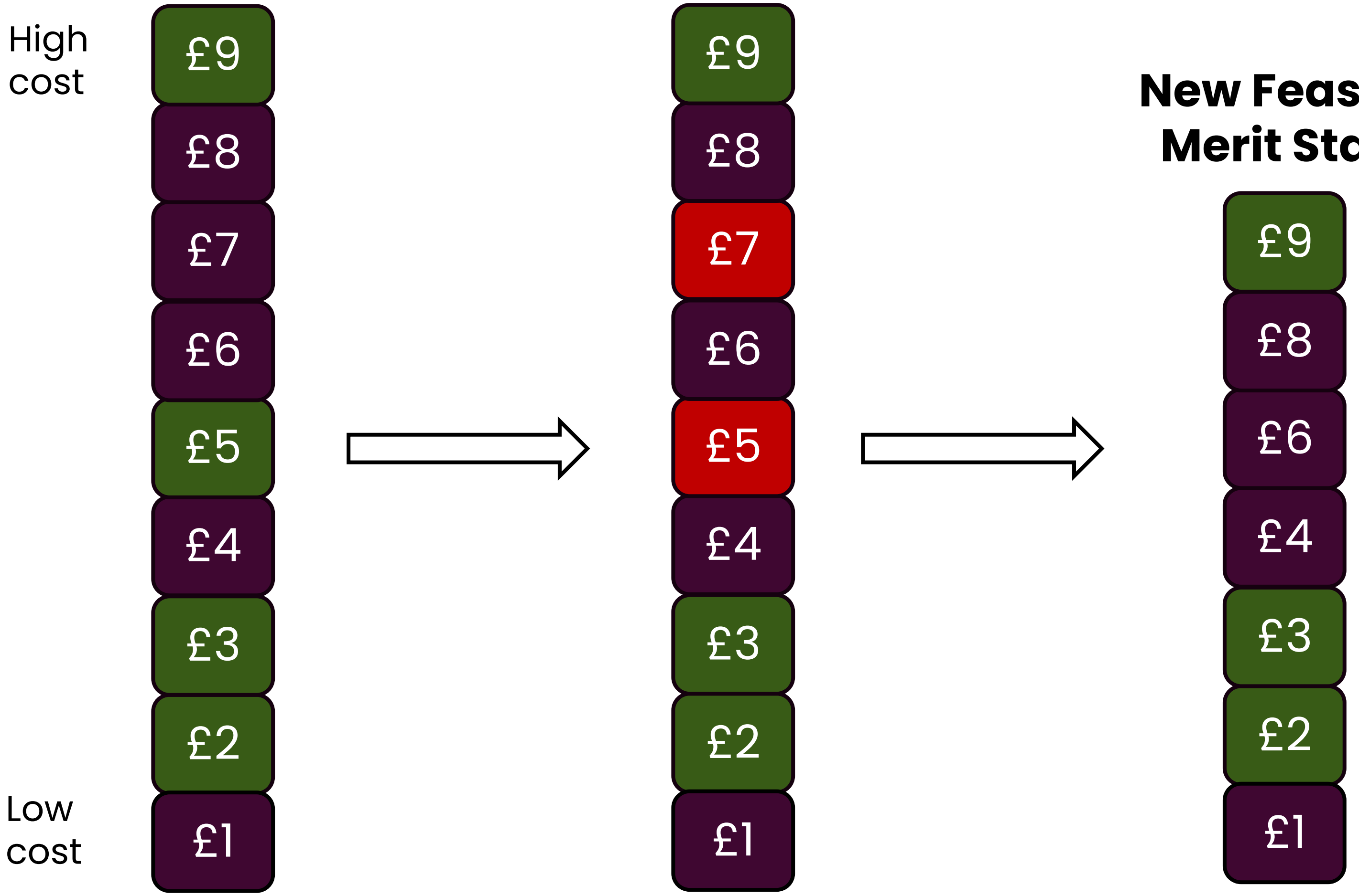
Feasible volume of 1 MWh - accepted by the control room

Example

Feasible Merit Stack

Step 1: Exclude volume inaccessible to the control room

New Feasible Merit Stack



Key:

- Green: Feasible volume of 1MWh - not accepted by the control room
- Purple: Feasible volume of 1MWh - accepted by the control room
- Red: Volume of 1 MWh not accessible to the control room

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Example

Feasible Merit Stack

High cost

£9
£8
£6
£4
£3
£2
£1

Low cost

Step 2: Calculate the total accepted volume of bids/offers within one group (the **group imbalance requirement**)

£1 + £4 + £6 + £8

Group imbalance requirement = 4 MWh

Key:

- Green: Feasible volume of 1MWh - not accepted by the control room
- Purple: Feasible volume of 1MWh - accepted by the control room

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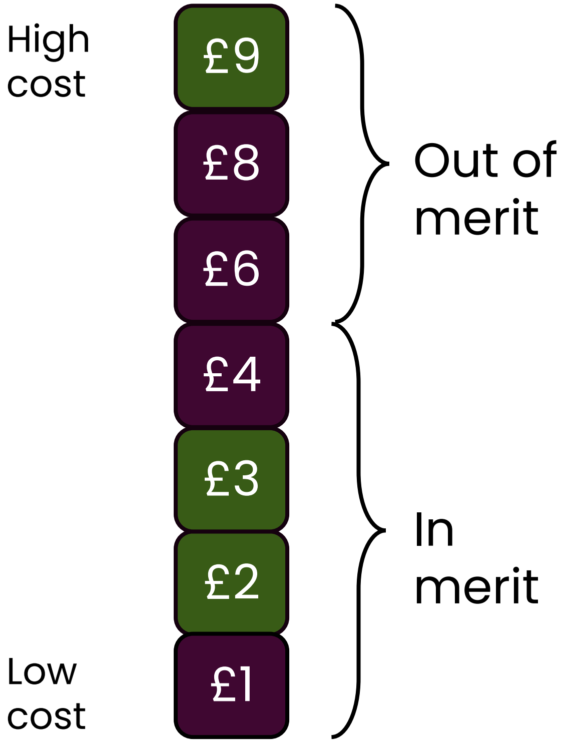
Example

Feasible Merit Stack



Step 3: The cheapest volume that can fulfil the group imbalance requirement is deemed 'in merit'

Group imbalance requirement = 4 MWh

Key:

- Feasible volume of 1MWh - not accepted by the control room
- Feasible volume of 1MWh - accepted by the control room

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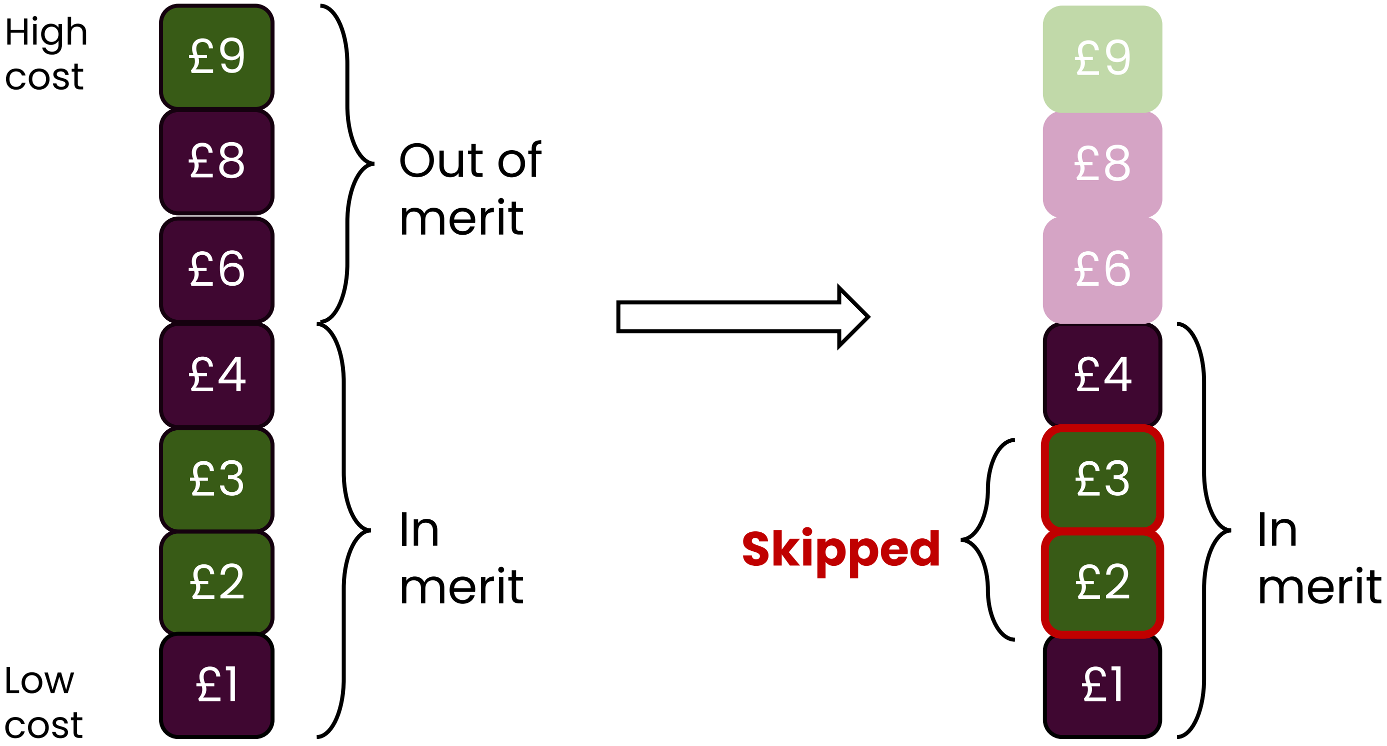
Example

Step 4: Any volume that was both deemed in merit and not accepted by the control room is considered skipped

Feasible Merit Stack



Key:

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