Public

Response Reform May Webinar – Static Response

NESO
National Energy System Operator

Static Reform – May ‘25 engagement

- Recap
- Feedback
- Current thinking
  - Requirement setting
  - Early Cease instruction
  - Operational Metering
  - Aggregation
  - Performance monitoring
- Next steps
- Q & A

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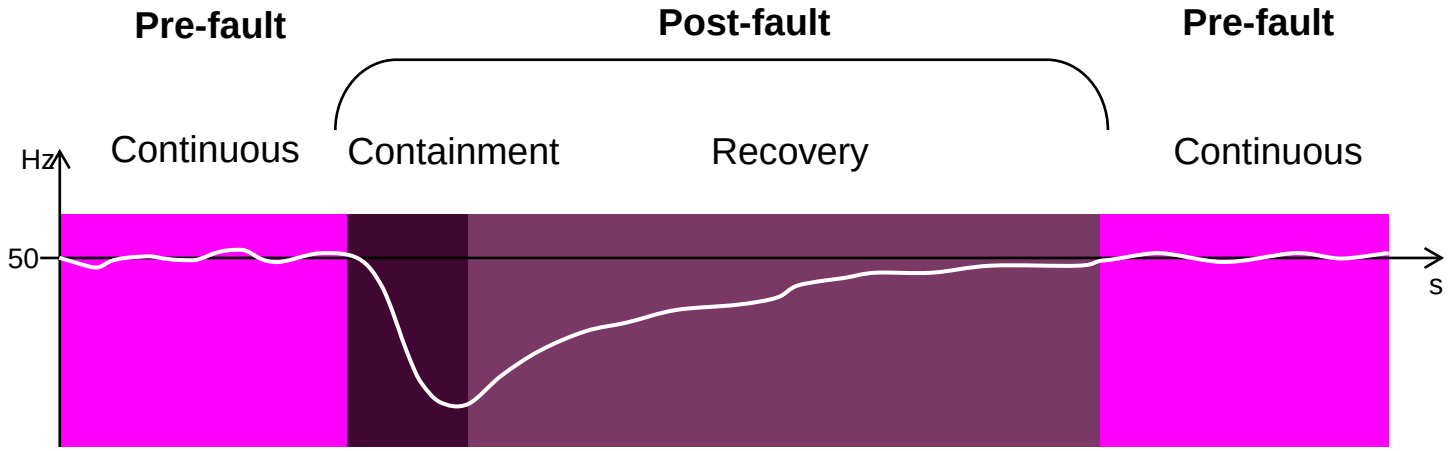
Recap - The role of Static FFR

Post fault service

We have two requirements we need to meet following a fault on the system

- Ensure system frequency doesn't drop below 49.2 – ***Containment requirement***
- Restore system frequency to within statutory limits (49.5) within 60 seconds – ***Recovery requirement***



Our containment and restoration requirements are calculated as a function of the **Demand**, **Inertia**, **Largest infeed loss** and **response held** on the system at any given period.

Static FFR ensures that we can meet our **recovery requirement**. **Dynamic Containment** can meet both our **recovery & containment requirement**, therefore Static FFR procurement is assessed against the **corresponding reduction in DC**.

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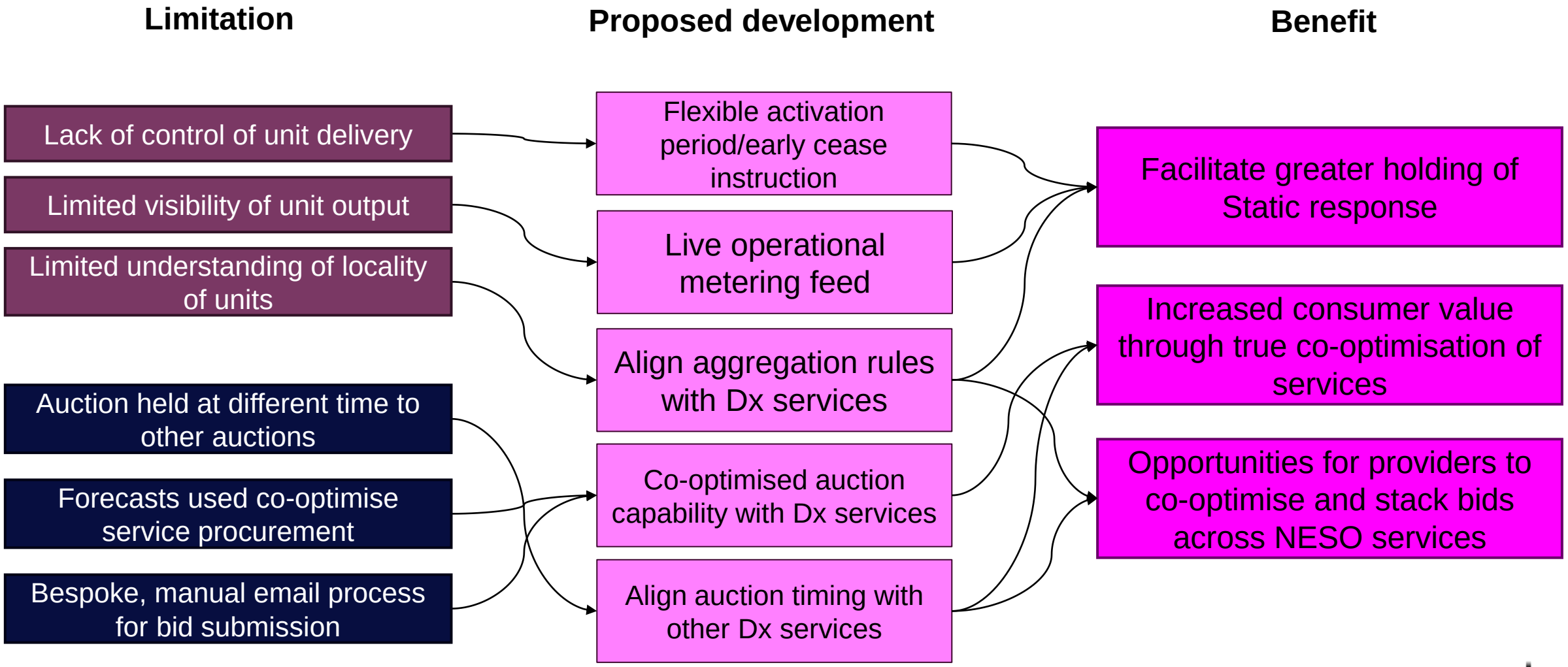
Recap - Priority areas being explored



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Feedback

Thanks for all the feedback received so far. We covered a range of topics and gathered some useful insight into your assets and the operations that sit behind them.

Key areas for today

- Flexible delivery period/early cease instruction
- Operational Metering
- Aggregation

Trigger level	Response times	Co-optimising Auction
How the number and consistency of triggers does have a material impact when it comes to machine degradation & process interruption. **We are still investigating the lowering of the trigger level.**	The capability of the assets currently participating and how response times are currently achieved. **We believe 30 seconds is a good fit for the future product.**	We believe there is consumer benefit in delivering this and something we propose looking at in future delivery of service design.

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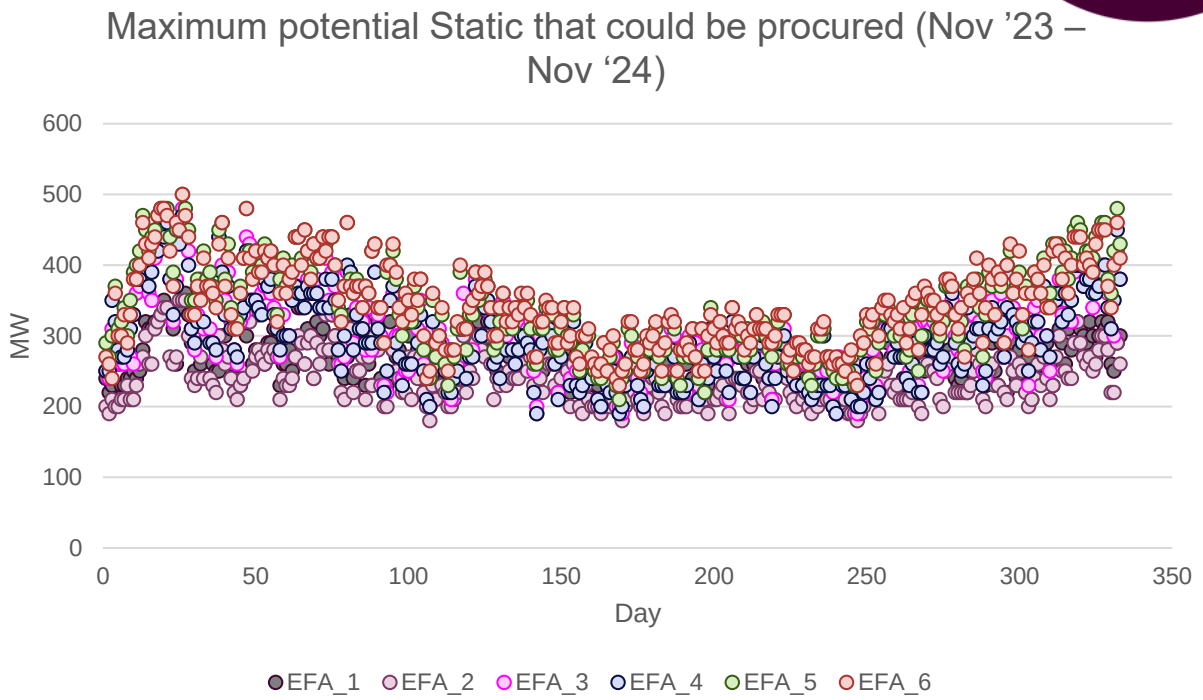
Targeted requirement setting

We currently don’t look to procure anymore than 250MW of Static FFR at any time. For certain periods, there is the potential that an increased proportion of Static frequency response could be held



Limitations currently stopping us looking to procure more than the 250MW cap

- **Control** – Limited control of behaviour of assets
- **Visibility** – Both in terms of output, expected output and locality of units
- **Market size** – Potential to grow this to meet requirements
- **Interaction with other services** – Interactions with other services that are operating in a post fault situation

As Static helps reduce our DC requirement, any procurement will always be assessed against a reduction in DC.

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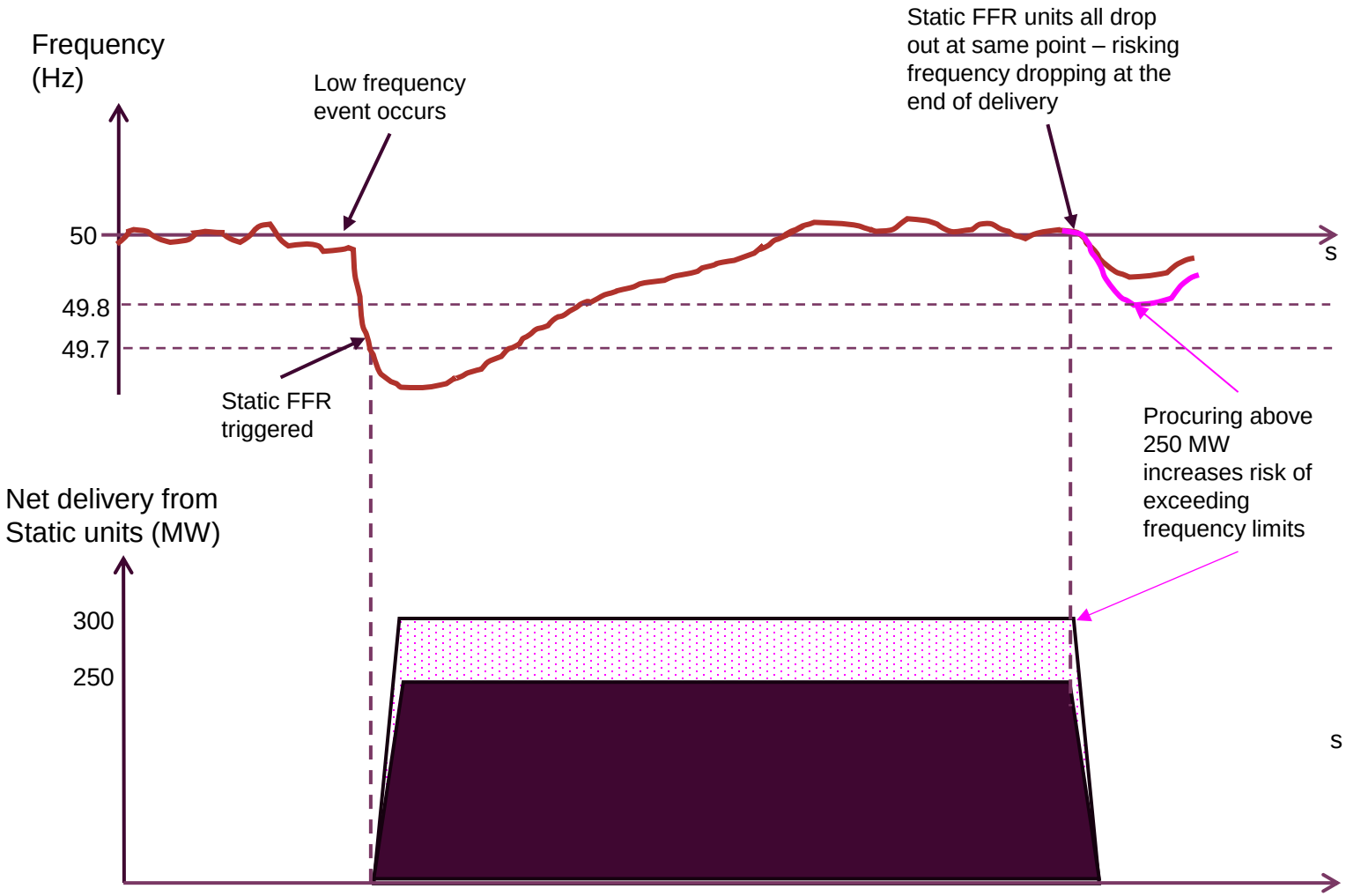
Early Cease Instructions

The current requirements dictate that Static FFR providers should deliver for a flat 30 minutes following a low frequency trigger. This leaves concerns around frequency dropping once delivery is complete, with all units returning to normal operation at the same time.

This is one of the contributing factors for looking to procure a flat 250 MW. Step changes above this magnitude have the potential to push frequency outside of operational limits



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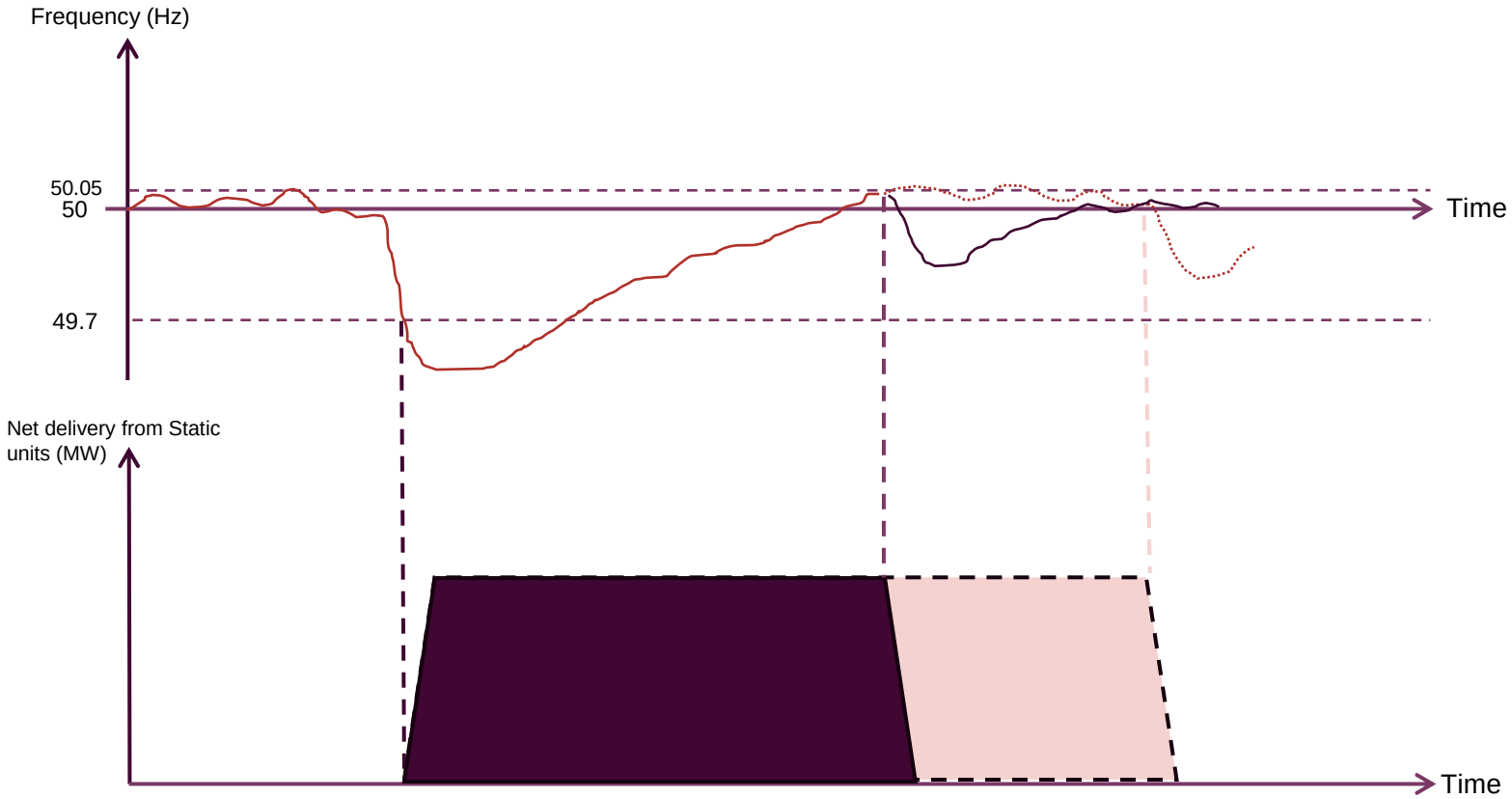
Early cease instructions

Option 1 – Single frequency trigger de-load

This option asks providers to set a frequency level at which they need to stop delivering the service. This would likely be set above 50.05Hz, to ensure that a frequency drop wouldn't risk breaching operational limits. It wouldn't avoid all units stopping delivery at the same time, however.



Helps mitigate against low frequency event at end of delivery, but don't avoid all units ending delivery at once

Early cease instructions

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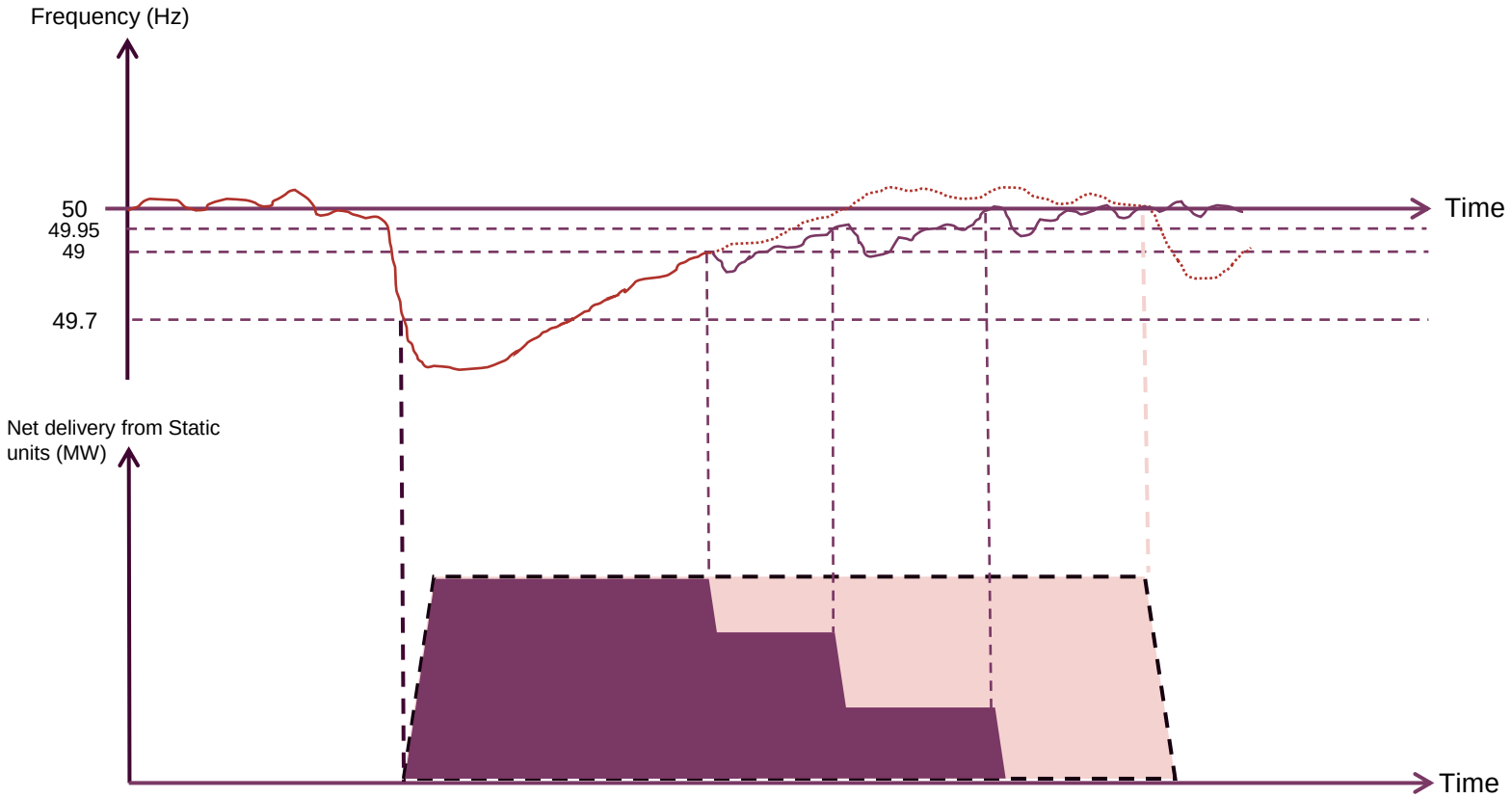
Option 2 – Multiple frequency trigger de-loads

This option would be the same as option 1 with the exception that there would be different trigger levels for different assets. This would ensure a smoother end of delivery from the static FFR providers, reducing any risk of frequency bounces at the end of delivery. This may be complicated for providers to implement and also for NESO to track, leading to imperfections during delivery



Brings units back in an ordered fashion, with a much smoother return for frequency. However, adds additional complication into service delivery for providers and more difficult to track in ENCC.

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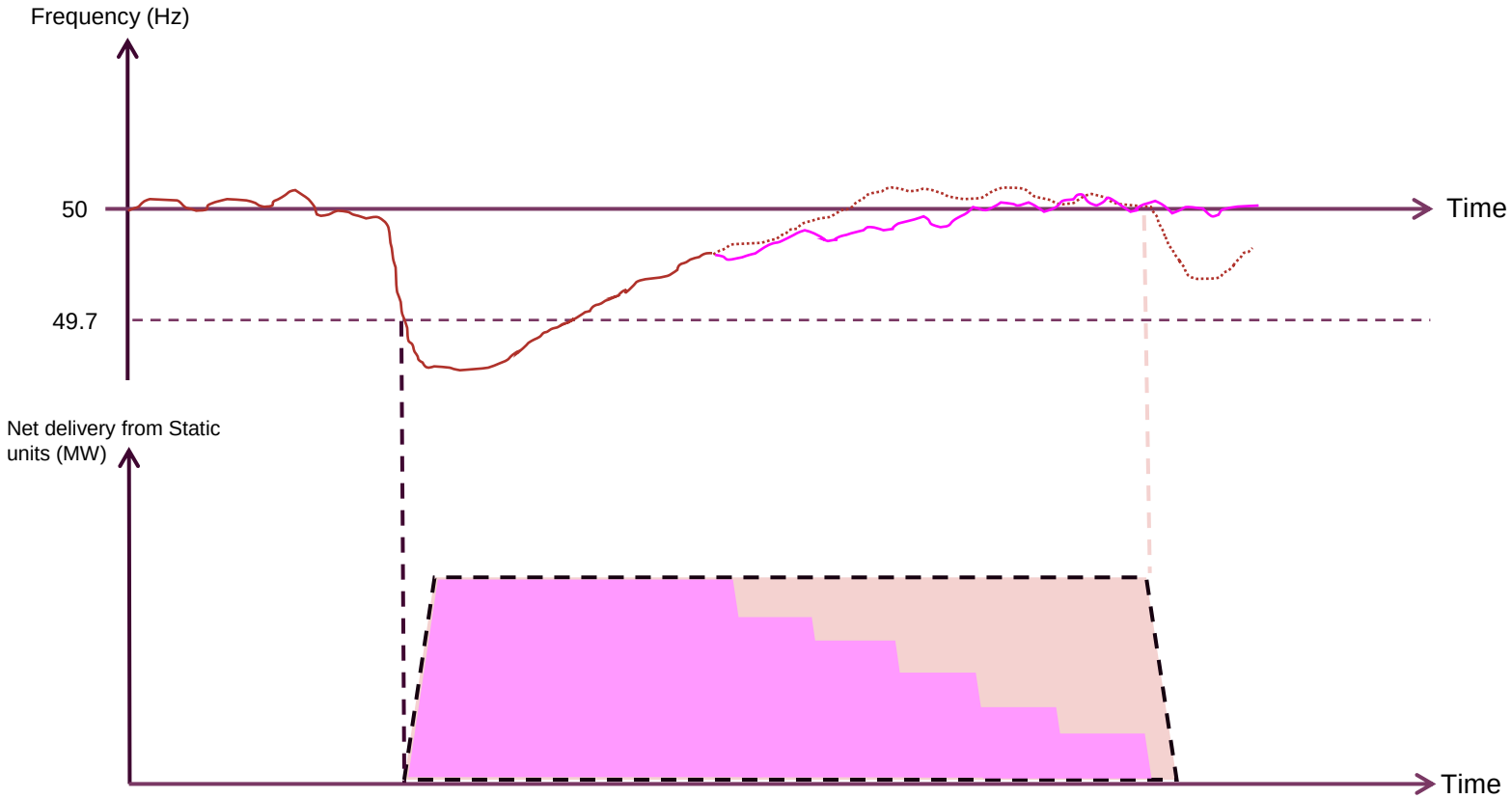
Early cease instructions

Option 3 – Early cease instruction (Proposed)

This option requires providers to have the ability to receive early cease instructions from the ENCC, allowing engineers to end the delivery early based on system conditions at the time. This gives the most amount of control and ensures the smoothest recovery following a low frequency event.



- **Would there be a need for a minimum activation period?**
- **We propose there being a fail safe 30-minute cease time (self-controlled) as a back up for any delivery period.**

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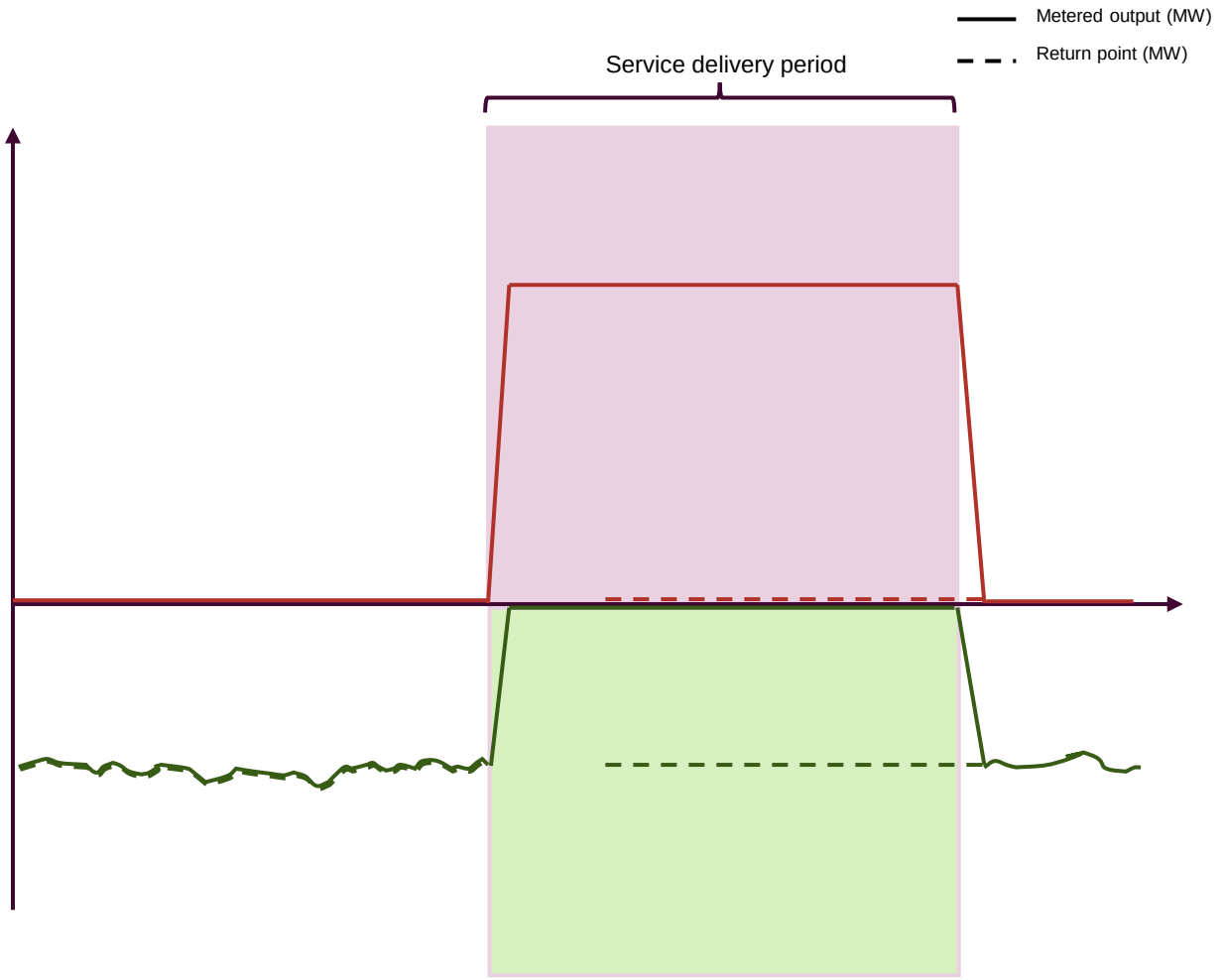
Operational metering – Proposal

During a low frequency event, having visibility of units delivering response is vital to situational awareness, ensuring economic dispatch decisions. The key information that needs to available to control engineers is:

- **Active Power output (MW)** – To view the current output of all delivering units
- **Return point (MW)** – To view where a unit should be returning to following an event
- **Trip Time/Trip status (e.g. Normal/Tripped)** – To confirm any variation between the output and return point is due to the low frequency trigger. To know what time the trip took place and therefore when the unit is expected to return to normal operation

Therefore, we are proposing units provide 4 real-time signals.



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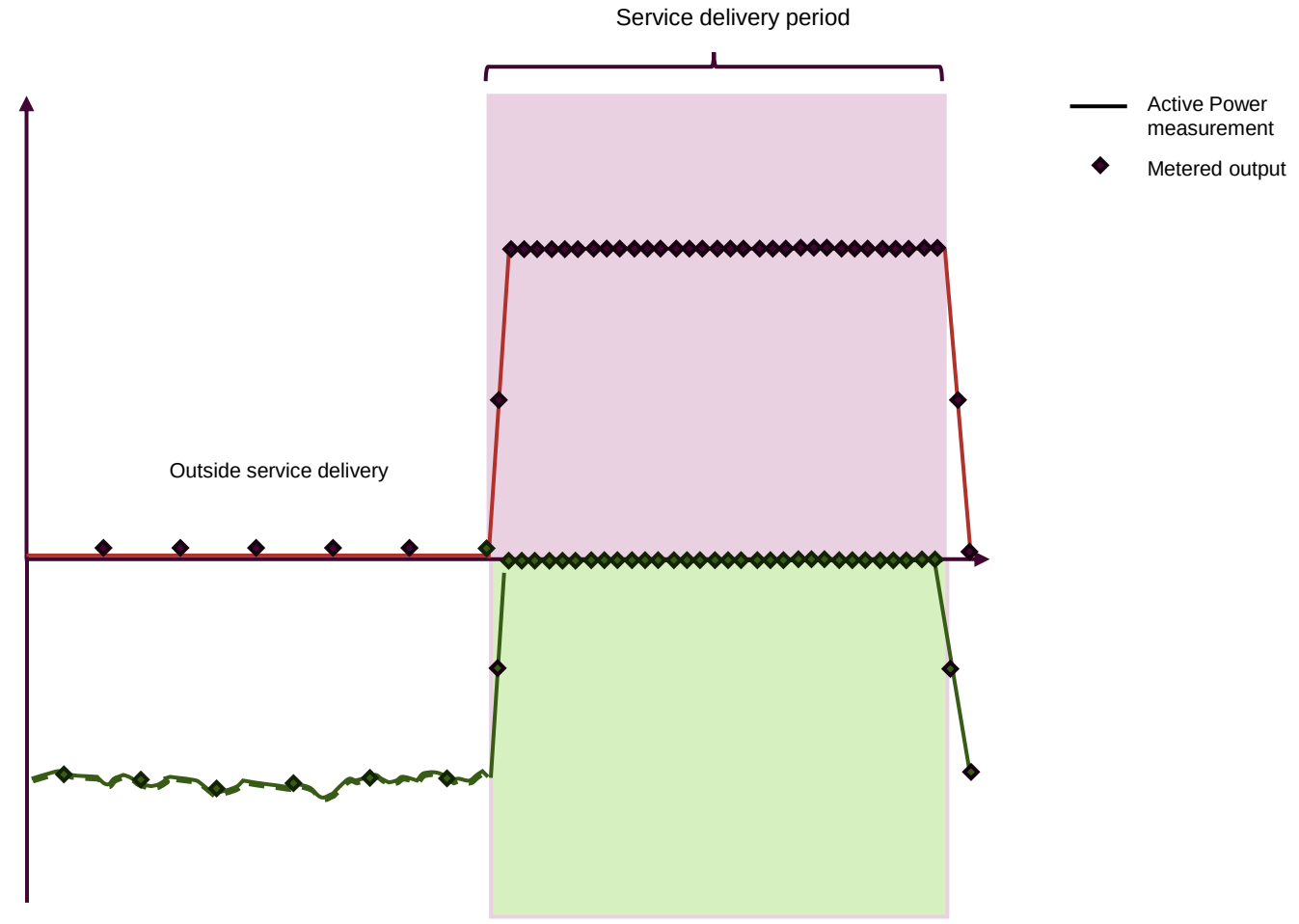
Operational metering – Active Power

We will aim to align any requirements for active power measurements with the outcome of the operational metering review that is due to complete in the coming months.

Typically, we require consistent meter read frequency for units participating in ancillary services. Recognising that certain technology types might benefit from a more targeted approach; we are exploring how we could adopt different approaches.

- **Outside a low frequency event** – Lower frequency of data is required
- **During delivery** – a higher frequency of data is required

For now, we are interested to know whether this is achievable for providers?



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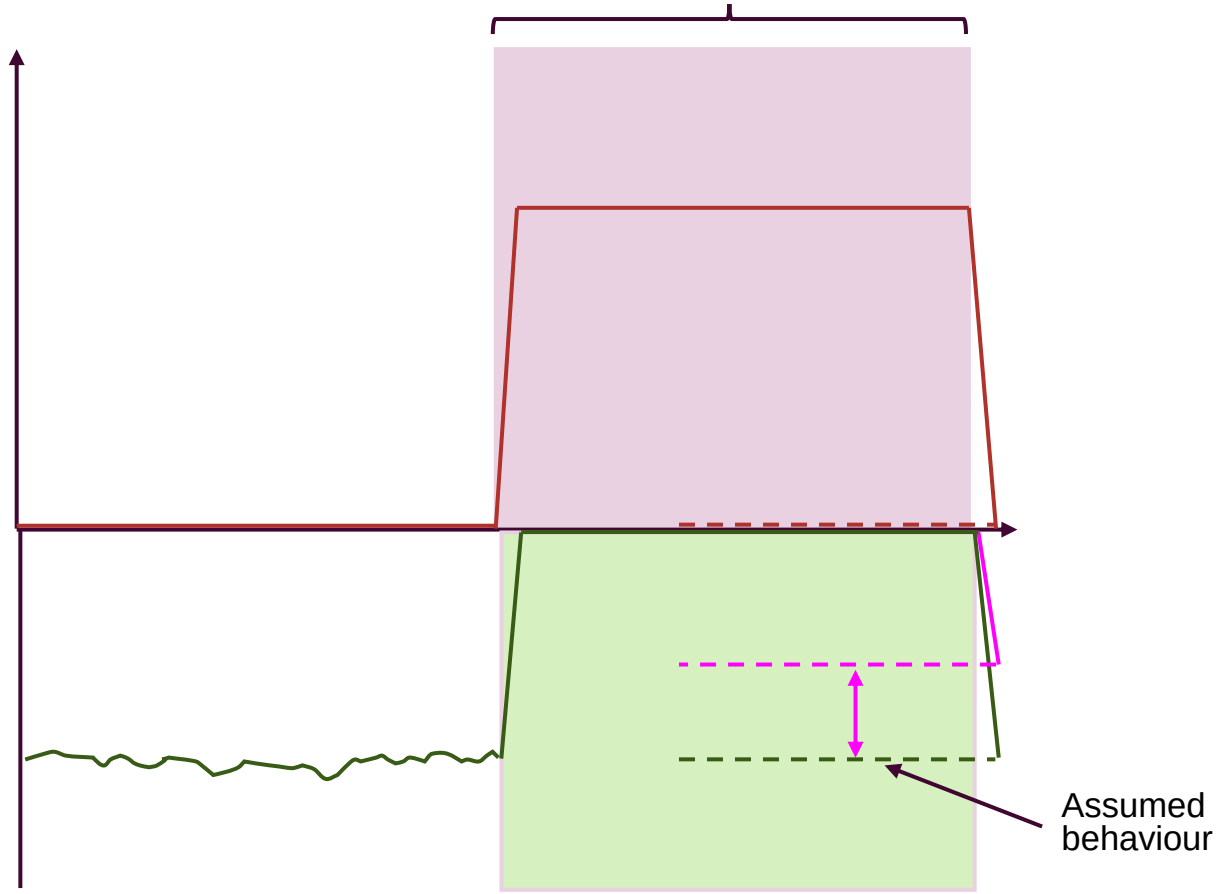
Operational metering – Return signal

To be able to bring back providers in an efficient and secure manner following a low frequency event, control engineers need to understand the level for which the unit is going to return to. The market is currently made up of two providers with presumed different operational profiles

- Deisel generators – Typically sitting 0 MW, waiting for a frequency trigger to dispatch
- Demand side response – Variable load based upon site processes or consumer activity

The assumption is the point just before a low frequency trigger will be where the unit will return to, however we understand for some units it may not be as simple as this.

We believe a return point signal will support the stable and efficient return of units following an event, we want to discuss with providers when it would be applicable and how it could be implemented.



Aggregation

Current national aggregation requirements has the potential to impact our response to a frequency event.

As we look towards locational procurement, aggregating units across similar regions is an important stepping stone. Current process has the potential to exacerbate

- Network constraints
- Local stability issues

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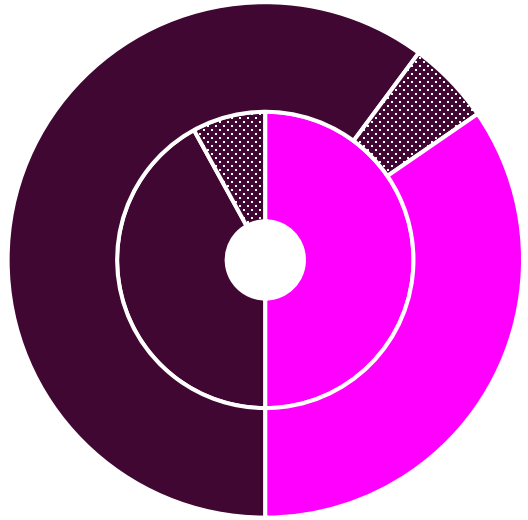
Unit breakdown by aggregation



Single unit | Aggregated over single GSP group | Aggregated over multiple GSP groups

Aggregated units that span multiple GSP groups make up half the active units in the market today (**inner ring**), equating to just over a third of the market size (**outer ring**).

Feedback from one provider was that aggregation at GSP group would prove difficult, **we want to understand whether allowing units to be Sub 1 MW (1 decimal place) would allow us to implement aggregation at GSP group level?**

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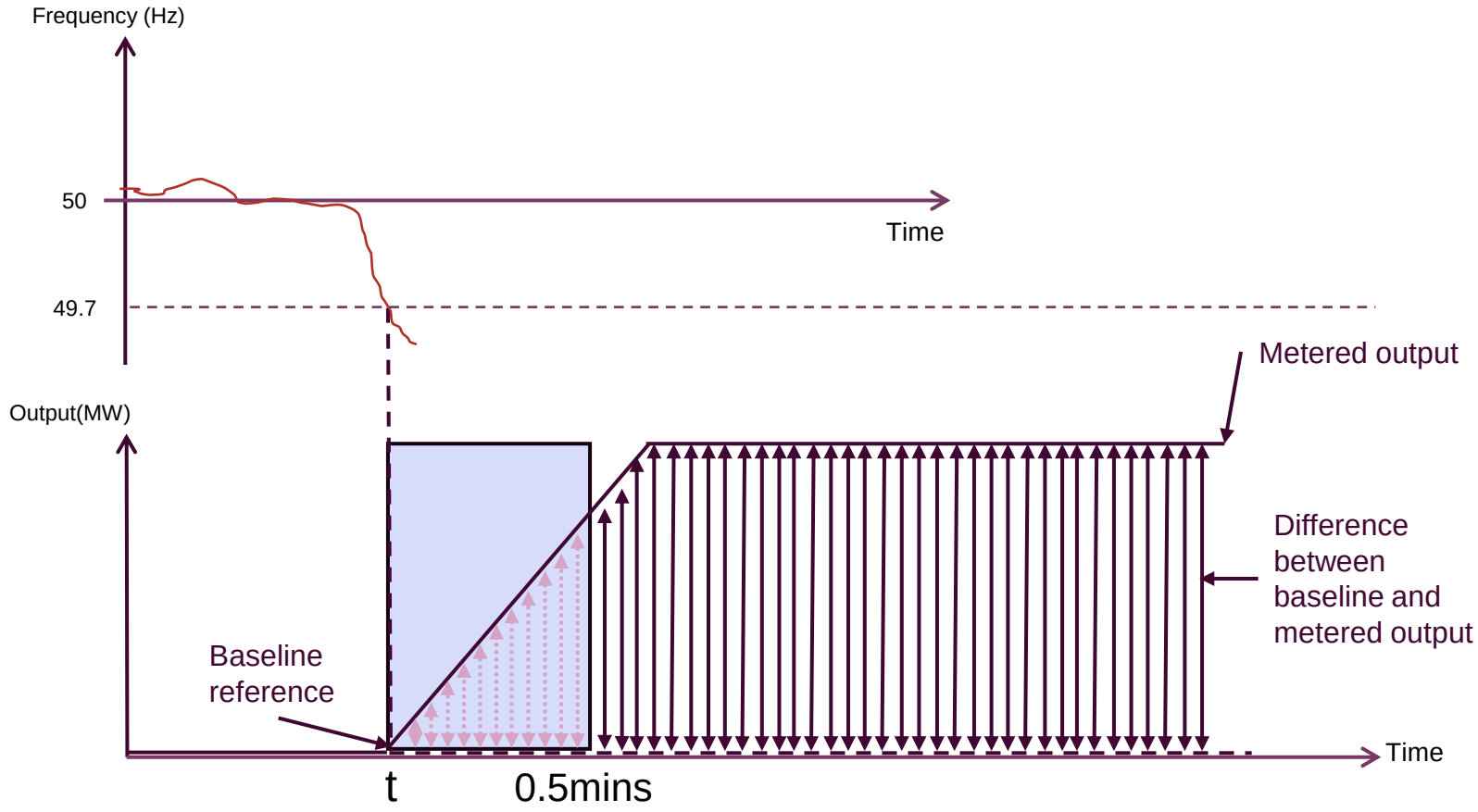
Performance monitoring

They key elements we need to ensure

1. A unit has delivered to full contracted output within the 30 seconds following a frequency event
2. A unit has maintained consistent delivery of the contracted for the 30-minute delivery period

The current requirement achieve this through 1 Hz metering data & assessing delivery from 30 seconds after a trigger to 30 minutes



Percentage Performance Measure (PPM) $=$

$$\left(\frac{Min(Difference\ between\ baseline\ and\ metered\ output)}{Contracted\ response}\right)$$

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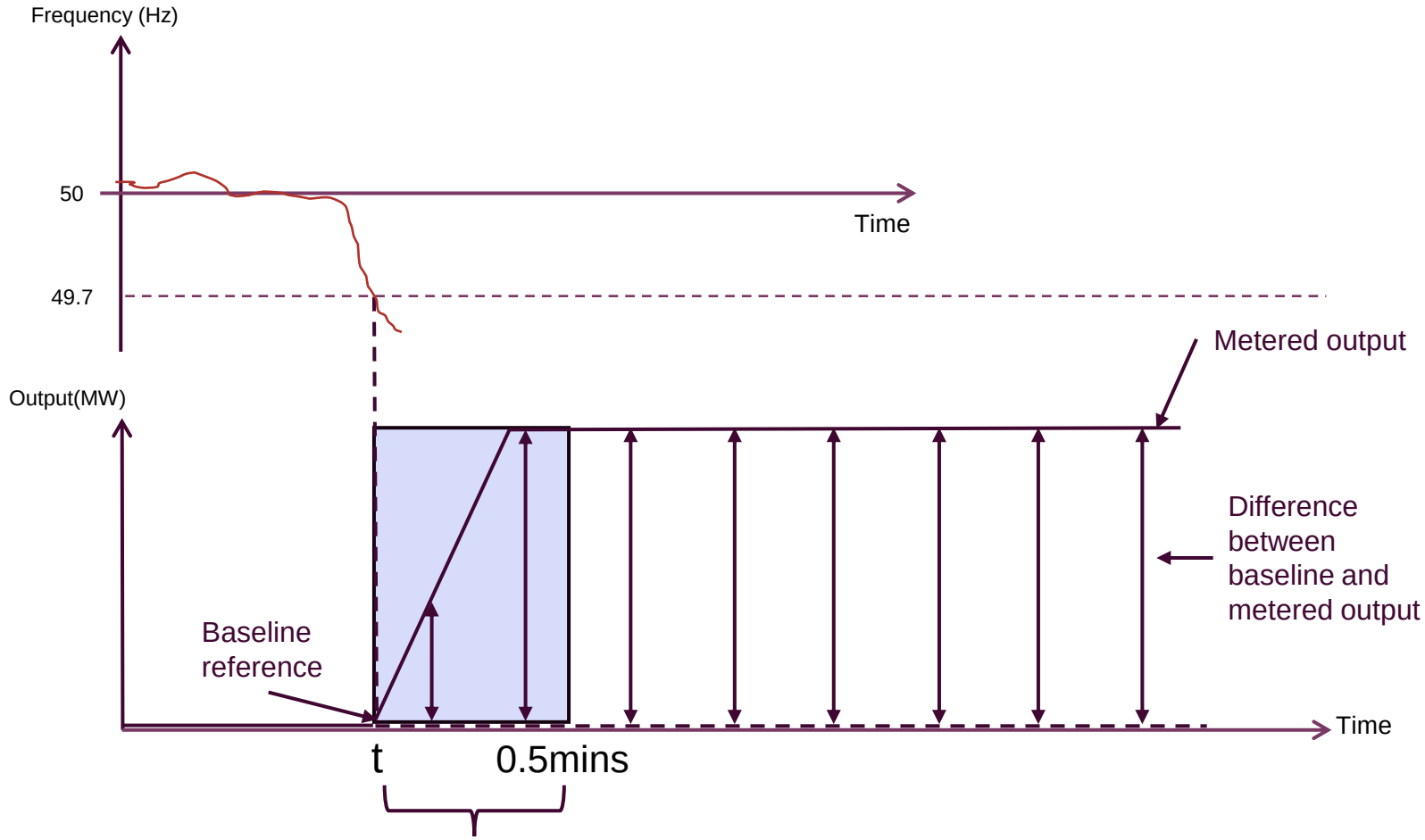
Performance monitoring

Without assessing 1Hz metering data, we are unable to validate a unit has delivered in 30 seconds. **An approach could be to allow a lower read frequency, if providers were able to ensure and prove delivery within 30 seconds through a faster response time.**

Example – A provider could submit 10 second performance monitoring data, meaning a response would be required in 20 seconds or less to guarantee the data would show full response was achieved in the 30 seconds.



Measurements received during first 30 seconds validate full response achieved

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To summarise

We are keen to gather feedback on…

- Any additional views on areas not discussed in detail today
  - Trigger level
  - Response times
  - Co-optimisation of Auction with DC
- Early cease instructions proposal
- Operational metering proposal
- Aggregation at GSP group level and Sub 1-MW units to facilitate this
- Views on Performance monitoring suggestion

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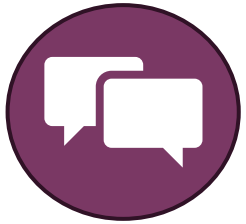
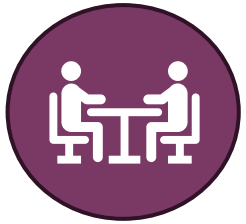
Next steps



Feedback on areas mentioned today



1-2-1 conversations with current and prospective providers

Follow-up session to present draft service design

Please contact laura.burdis@neso.energy to provide any feedback on the content included in this presentation or to arrange a 121 to discuss this further.

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Q & A

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