Public

# Balancing Reserve Guidance Document

Version 4 – November 2025

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National Energy System Operator

# Version History

| Version | Added Information | Date Published |
|---|---|---|
| V1 | N/A | February 2024 |
| V2 | <ul><li>NESO rebranding.</li><li>Minor typographical corrections.</li><li>Updates to the splitting matrix for QR and SR service design decisions.</li><li>Clarification on Operational Metering expectations for BMUs providing BR.</li><li>Correction to the performance monitoring calculation for utilisation to correctly apply response energy for stacked response and reserve providers.</li><li>Inclusion of the Incremental Volume Cost (IVC) methodology and definitions of 'Commercial Unavailability' and 'Technical Unavailability'.</li><li>New ramp rate check example to include our method for testing time to full delivery on units with multiple ramp rates and elbow points.</li></ul> | November 2024 |

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# Version History

| Version | Added Information | Date Published |
|---------|-------------------|----------------|
| V3 | • Updated the guidance following changes to the dispatch flexibility parameters and auction timings<br>• New guidance on how BR providers should submit their physical data to comply with the guidance in the EDL/EDT guidance document without impeding their BR contract delivery (https://www.neso.energy/document/300231/download) this document has also been updated with the same. | October 2025 |
| V4 | • New Guidance on Dispatch Parameters | November 2025 |

# Contents

## Appendix

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# Balancing Reserve Overview

# Balancing Reserve

**The information in this guidance is tailored to support Balancing Reserve providers.** This document complements the BR contractual documents: the Service Terms, Procurement Rules and Balancing Services Glossary as were approved by Ofgem originally in February 2024 and updated in October 2025. In the event of any conflict or inconsistency between this document and the contractual documents, the latter shall prevail.

**Balancing Reserve** was the first of our new suite of Reserve products. The BR market allows us to procure access to upwards flexibility (headroom) and downwards flexibility (footroom) through two new balancing services: Positive Balancing Reserve and Negative Balancing Reserve. This capacity can then be manually dispatched by NESO control engineers in real time. Balancing Reserve can be dispatched in both pre and post fault system operation scenarios. Contracted BR units can be dispatched to correct persistent energy imbalances such as when wind output is consistently above or below our forecasts. BR units could also be dispatched to replace energy from constrained generators or to help replace exhausted response or other reserve services following a fault on the network which has created a large energy imbalance.

We ran an Article 18 EBGL consultation for Balancing Reserve which concluded in February 2024 and followed this with another consultation to make changes to the service including the co-optimisation with other Reserve and Response products, which gained Ofgem approval in October 2025.

The documents include Service Terms, which describe the technical specification for the provision of Balancing Reserve, and Procurement Rules, which describe the eligibility rules for participation in the services and explain how the BR market will function.

This guidance is published to support the onboarding and continued participation in the BR service by service providers. It is designed to give additional information on the rules and recommendations regarding the delivery of these services, along with relevant use cases. This document will be updated periodically.

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# BR Availability Payments



**Price**

NESO buy price

Clearing Price

1

2

3

4

0

Procurement Target

**Quantity**

— Buy Curve
······ Market Clearing Price
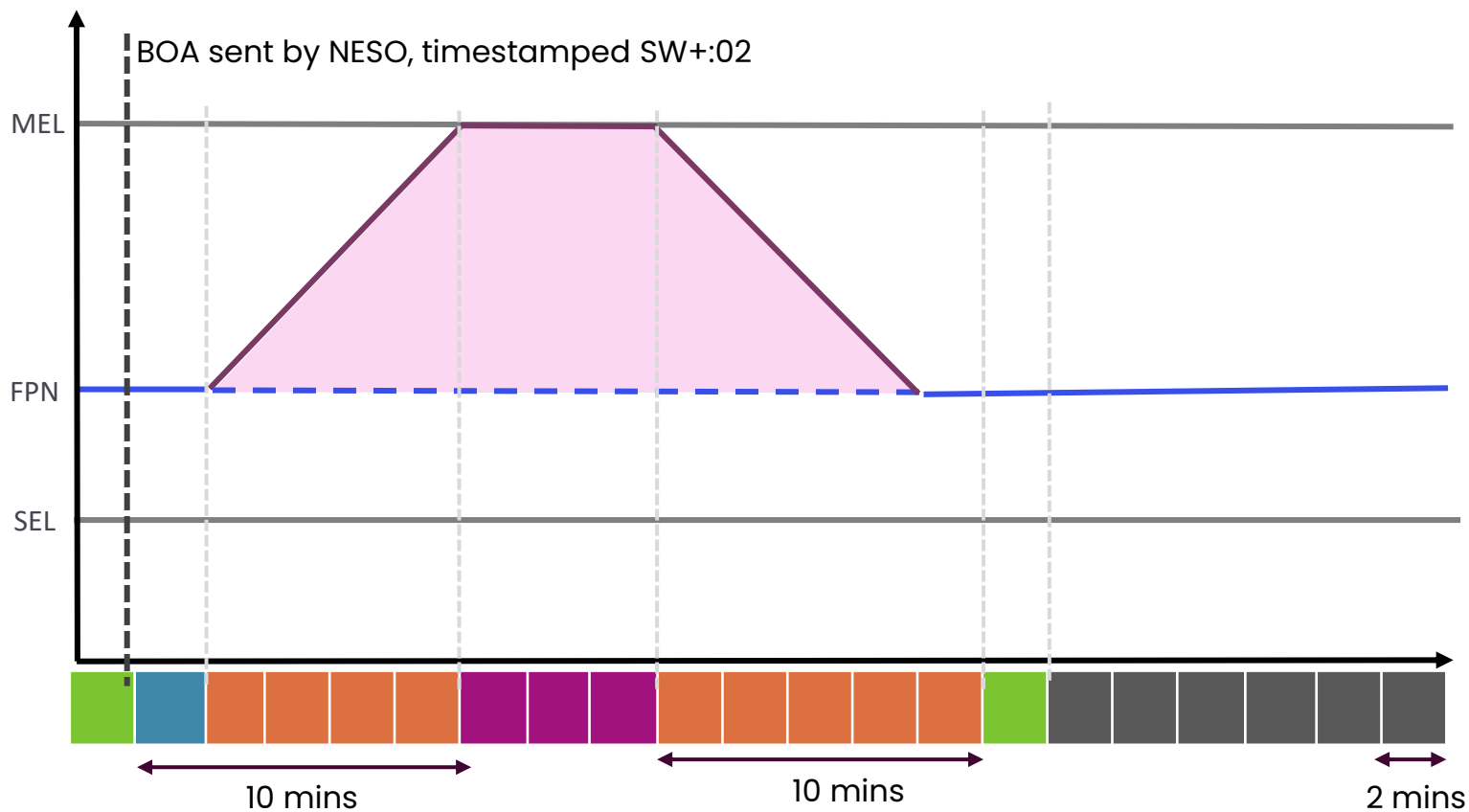▇ Accepted Sell Order
▇ Rejected Sell Order

**Availability Payments**
- The day ahead BR auction is Pay-as-Clear and uses EAC infrastructure.
- Forty-eight 30-minute service windows for both Positive Balancing Reserve and Negative Balancing Reserve.
- Market participants submit their availability prices and BR offered volumes before 14:00 Gate Closure time.
- NESO submits a buy order which represents the willingness to pay for a given volume of firm BR volume.
- An auction is conducted by auction partners NSIDE using the same auction as for EAC.
- A cohort of accepted sell orders and buy orders is determined to maximise market welfare.
- A clearing price is determined to maximise market welfare whilst minimising total cost of procurement.

**Availability payments are made by NESO's settlements team to successful market participants.**

Detailed information about the day ahead auction can be found in this market explainer document.

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# BR Utilisation Payments



BOA sent by NESO, timestamped SW+:02

MEL

FPN

SEL

10 mins

10 mins

2 mins

**Legend:**
- Final Physical Notification
- Available to be dispatched, contracted through DA auction
- Delivering against BOA
- Maximum Export Limit/ Stable Export Limit
- Notice to Offer (NTO)
- Next service window
- BOA sent by NESO
- Maximum ramping time
- Offer volume ( in MWh)

## Utilisation Payments

- Utilisation of BR is through bids and offers in the BM.
- Holding a BR contract is not a guarantee of dispatch – in some periods reserve will not be required, or the unit may not adequately meet the system need (e.g. we may not be able to dispatch units located behind constraints).
- Submitted dynamic parameters, MEL, SEL and FPN should reflect contract terms.

**Payments for utilisation are made from Elexon via the usual BOA settlements processes.**

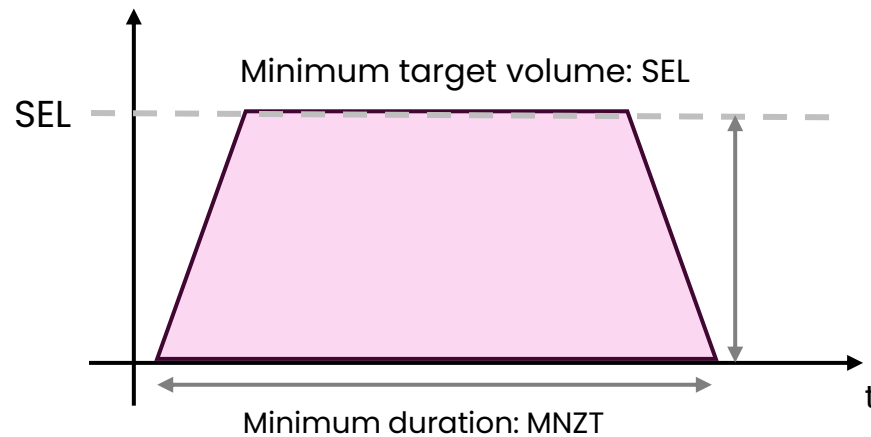Detailed information about trading charges can be found in
 Elexon BSC - Trading Charges

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# Service Specification

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# Overview of Technical Parameters

| Design Element | Proposal | References |
|---|---|---|
| Direction | Positive Balancing Reserve (Upwards flexibility) and Negative Balancing Reserve (Downwards flexibility). | |
| Minimum Contract Size | 1 MW | |
| Provider Eligibility | BM Units with a back up means of dispatch (control or system telephony) during contracted windows | |
| Response Times | Up to 10 minutes (including Notice to Offer (NTO) / Notice to Bid (NTB) and the Ramping Period) | BR Service Terms, Schedule 2 |
| Energy Requirement | The unit must be able to deliver the full contracted capacity per Service Window | |
| Operational Metering | As per Grid Code, 1Hz is the standard required for BM participation. If units are accepted for BM participation with less granular operational metering at the sub asset level, this can also be acceptable for BR participation. | Grid Code, BC4.4 |
| Dispatch mechanism | Bid Offer Acceptance (BOA) to contracted BM units. | Grid Code, BC2.7.1 or BC2.8 |
| Notice to start ramping (NTO/NTB) | As per Grid Code - 2 minutes. This parameter can be lower than 2 minutes. | Grid Code BC1.A.1.5 |
| Ramp rates(Run up/down rates) | Minimum ramp-up and ramp-down rate to be in line with Time to full delivery. No maximum ramp rate. | BR Service Terms, Schedule 2 |
| Baselining | Physical Notifications (PNs) submitted in line with Grid Code specifications. | Grid Code, BC1.A.1.1 |
| Dispatch Flexibility | Dispatch must not be limited by Stable Import Limit (SIL)/ Stable Export Limit (SEL), Minimum Non-Zero Time (MNZT) or Minimum Zero Time (MZT). For units offering Positive BR from 0MW or through 0MW, SEL must be less than or equal to 25MW and MNZT less than or equal to 5 minutes. For units offering Positive BR from any FPN >0 this does not apply. For units offering Negative BR from 0MW or through 0MW, SIL must be less than or equal to 25MW and MZT must be less than or equal to 5 minutes. For units offering Positive BR from any FPN <0 this does not apply. | BR Service terms, section 8 BR Service Terms, Schedule 2 |

# BR Dispatch Parameters

| | Dispatching from zero FPN | Dispatching from non-zero PFN |
|---|---|---|
| Minimum Size of instruction (Service Terms 8.1.2) | SEL : SEL ≤25MW | 1 MW |
| Minimum Duration of instruction (Service Terms 8.1.3) | MNZT: MNZT ≤ 5 mins | 1 minute |
| Ramp up/Ramp down rates (Service Terms 5.13, Schedule 2) | Such that the unit can reach the SEL in the MNZT | Such the Response Time ≤ 10 mins |
| NTO/NTB (Service Terms Schedule 2) | NTO/NTB ≤ 2 mins | |



SEL

Minimum target volume: SEL

Minimum duration: MNZT



1 MW

Minimum target volume: +1 MW

BOA Sent

Maximum duration: 10 minutes

Minimum duration: 1 minute

Maximum duration: 10 minutes

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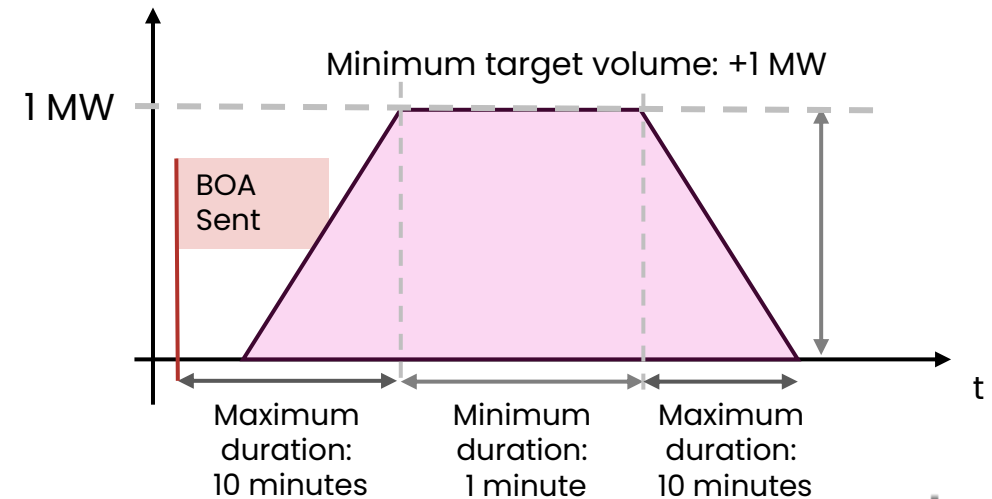
# Splitting

**Splitting**

*'Splitting' – earning revenue and being able to deliver multiple services from the same asset in the same time period, but not from the same MW. The asset can provide different MWs at the same time, providing the ability of the asset to deliver in all contracted service(s) is not impeded.*

The Energy Networks Association developed common definitions for Service Stacking breaking stacking into three sub-categories: "Co-Delivery", "Splitting" and "Jumping". See the paper with full definitions [here](#).

The Balancing Reserve auction is now co-optimised with the Dynamic Response & Quick Reserve auction (also called the "EAC auction") and therefore providers can no longer split with Response as that is currently under review.

Providers will continue to be able to split within Balancing Reserve in opposite Directions.

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# Splitting Matrix

## Splitting with Response

Splitting is allowed between any frequency response products (i.e., any combination of DCL, DCH, DML, DMH, DRL, and DRH).

## Splitting within Reserve
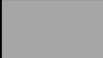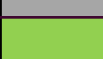
Splitting is allowed between Balancing Reserve products (PBR and NBR), between Quick Reserve products (PQR and NQR), and between Slow Reserve products (PSR and NSR).

However, splitting is not currently allowed between different Reserve products.

## Splitting Reserve with Response

Splitting Reserve with Response may be available once Performance Monitoring allows.

**Legend:**
- Green = Allowed
- Navy = Not allowed
- Grey = Not applicable
- Yellow = Under review

| Splitting Matrix | | | Response | | | | | | Reserve | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | DC | | DM | | DR | | BR | | QR | | SR | |
| | | | DCL | DCH | DML | DMH | DRL | DRH | PBR | NBR | PQR | NQR | PSR | NSR |
| Response | DC | DCL | Not applicable | Allowed | Allowed | Allowed | Allowed | Allowed | Not allowed | Under review | Under review | Under review | Under review | Under review |
| | | DCH | Allowed | Not applicable | Allowed | Allowed | Allowed | Allowed | Under review | Not allowed | Under review | Under review | Under review | Under review |
| | DM | DML | Allowed | Allowed | Not applicable | Allowed | Allowed | Allowed | Not allowed | Under review | Under review | Under review | Under review | Under review |
| | | DMH | Allowed | Allowed | Allowed | Not applicable | Allowed | Allowed | Under review | Not allowed | Under review | Under review | Under review | Under review |
| | DR | DRL | Allowed | Allowed | Allowed | Allowed | Not applicable | Allowed | Not allowed | Under review | Under review | Under review | Under review | Under review |
| | | DRH | Allowed | Allowed | Allowed | Allowed | Allowed | Not applicable | Under review | Not allowed | Under review | Under review | Under review | Under review |
| Reserve | BR | PBR | Not allowed | Under review | Not allowed | Under review | Not allowed | Under review | Not applicable | Allowed | Not allowed | Under review | Not allowed | Under review |
| | | NBR | Under review | Not allowed | Under review | Not allowed | Under review | Not allowed | Allowed | Not applicable | Under review | Not allowed | Under review | Not allowed |
| | QR | PQR | Under review | Under review | Under review | Under review | Under review | Under review | Not allowed | Under review | Not applicable | Allowed | Not allowed | Under review |
| | | NQR | Under review | Under review | Under review | Under review | Under review | Under review | Under review | Not allowed | Allowed | Not applicable | Under review | Not allowed |
| | SR | PSR | Under review | Under review | Under review | Under review | Under review | Under review | Not allowed | Under review | Not allowed | Under review | Not applicable | Allowed |
| | | NSR | Under review | Under review | Under review | Under review | Under review | Under review | Under review | Not allowed | Under review | Not allowed | Allowed | Not applicable |

# Joining the Balancing Reserve Service

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# High Level User Journey

| Stage | Explore | Onboarding /Account Management | Participate | Contract Management | Schedule / Dispatch | Review | Payment |
|---|---|---|---|---|---|---|---|
| **User Journey** | Gather data and information<br><br>Build business case<br><br>Understand codes, markets and connections<br><br>Understand Service Parameters | User, company, unit asset registration<br><br>Pre-qualification<br><br>Agent set up<br><br>Contract Accession<br><br>Asset / Unit versioning<br><br>User Management | Tender Submission<br><br>Action Submission<br><br>Co-optimisation | Contracts awards and status<br><br>Manage contracts | Availability management<br><br>Instructions | Data submission / collection | Performance monitoring<br><br>Settlement<br><br>Penalties<br><br>Disputes<br><br>Financial position |
| **NESO Systems** | DEP<br>NESO Website | SMP | EAC<br>SMP | SMP<br>Data Portal | OBP/BM | DEP<br>SMP | Settlement System<br>SMP |

## Acronyms

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# First Time User Journey

**If you and your organisation are new to NESO and to the SMP Portal, then it is required that you register directy via the portal using the following instructions.**

The User should visit and bookmark the following link: Login

As a first time user, you will need to click the "Register New Account" button. Users will be navigated to the first 'screen' to capture Registration.

## Registering New Primary User

In order to access the SMP Portal, it is expected that upon initial registration the main or 'primary' contact (user) at your organisation/company will undertake the registration steps.

Registration involves submitting one's contact details and their organisation/company details. The successive order is contact details followed by company details.

When entering email addresses or telephone numbers, standardised formats are expected, if a User/Contact does not submit field values compatible with the expected format then the field will be flagged in a red border with a prompt instruction. For example, if an email address has been submitted with the incorrect format.

Once all of the fields have been completed on the User/Contact section, the "Next" button will no longer be shaded grey, instead it will be converted into a blue 'button', allowing you to proceed to the next step.

## Registering the Primary User's Company

The 'Register new Account' stage involves two pathways depending on the Company Status. If the User/Contact's organisation is a UK Limited Company, they select the first checkbox. If the User/Contact's organisation is a non-UK Company then they select the second checkbox.

Once the option is selected, the user clicks on the "Next" Button.

## Registering a UK Company

The User/Contact will be prompted to search for the Company Name and the Company Registration Number.

For Company Name - they will be expected to enter the name, which will trigger a lookup search/listing of similar names for the user to choose from.

For Company Registration Number - they will be expected to enter the exact reference number, which will trigger a lookup search/listing for the user to select and confirm.

Please note that only valid and accurate Registration Numbers will be accepted and appear in the search

exercise.

For Company Registration Number - they will be expected to enter the exact reference number, which will trigger a lookup search/listing for the user to select and confirm.

Please note that only valid and accurate Registration Numbers will be accepted and appear in the search exercise. If your Company is a UK Limited Company and the search listing is unsuccessful, you will need to reach out to your NESO Account Manager by email

Once a match has been found, the User/Contact must select the "Submit" button to proceed to the next step.

If the search result is incorrect or the User/Contact wishes to undertake a new search, then they are expected to click on the "Remove Company" link to refresh the search functionality.

Once the search result is correct, then the User/Contact selects the "Submit" button on the bottom right right-hand corner of the screen.

For more information on this process, or for information on registering a non UK company click here.
For support please contact:
commercial.operation@nationalenergyso.com

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# User and Asset Registration

Once you have registered as a user on SMP, you can begin creating your units and assets you wish to prequalify for Balancing Reserve.

In order to do so, you should enter your SMP account via the following link:
https://portal.nationalenergyso.com/smp/s/login/

If you are a first-time user, please follow the guidance on the prior slide to register yourself/your company.

If not, or you have already completed first time user registration, you can proceed to register your Units and Assets in SMP and pre-qualify them for Balancing Reserve (Positive and/or Negative).

For users who already have Assets and Units in SMP, for other services (i.e DC/DM/DR), that you wish to pre-qualify for Balancing Reserve, you can move ahead to **Pre-qualifying Units for Balancing Reserve.**

## Registering New Assets and Units

You can register new Assets and Units on the SMP portal, by following the instructions in the demo video linked here: Creating Assets and Units in SMP

 or by following the instructions in **Section 4 and 5** of the SMP External User Guide

This process is the same as for any other services you have pre-qualified for in SMP; such as DC, DM or DR.

## Prequalifying Units for Balancing Reserve

In order to prequalify your units for Positive or Negative Balancing Reserve, you should have created your Assets and Units, and linked them together (As per the prior video and section 6 of the User Guide). You can then proceed to pre-qualification, by following the instructions in the demo video linked here (ensure you have selected the relevant Balancing Reserve service): Prequalifying Units for Balancing Services

Or by following the instructions in **Section 7** of the SMP External User Guide

Once you have submitted your unit/s for pre-qualification, they will be reviewed by the NESO team. We will check that: a signed Form B has been provided, as well as that the Unit information is correct and meets the service parameters. If all of this is true, your unit will be approved and is ready to take part in Balancing                                                    Reserve.

For technical support, and SMP queries, please contact:
commercial.operation@nationalenergyso.com

# Order Submission Process (EAC)

**The following section will give a step-by-step guide to submitting orders on EAC. If you and your organisation are new to NESO and have yet to register to SMP, then it is required that you register there first. All participants must then be registered as a user for EAC, even after registering units on SMP.**

After registering for EAC and logging in with 2-factor authentication the first step is to select that auction that you would like to bid into. All auctions with gates open can be found under the 'Auctions' tab.

After you have selected the auction that you would like to bid into you will need to select the unit you would like to use from the drop-down menu.

Following this you will start to build and add your baskets (defined by 30 minutes service windows). You will give your basket a name and a family name if these are looped baskets and add in the relevant information such as price volume and any child order or substitutable child orders as required.

Once all of the relevant information has been added the bid can be submitted.

After the auction results can be found in the results tab for your relevant unit, all results will be published on the Data Portal for all units.

Please note that bids can also be submitted via API, to obtain API credentials please contact NESO.
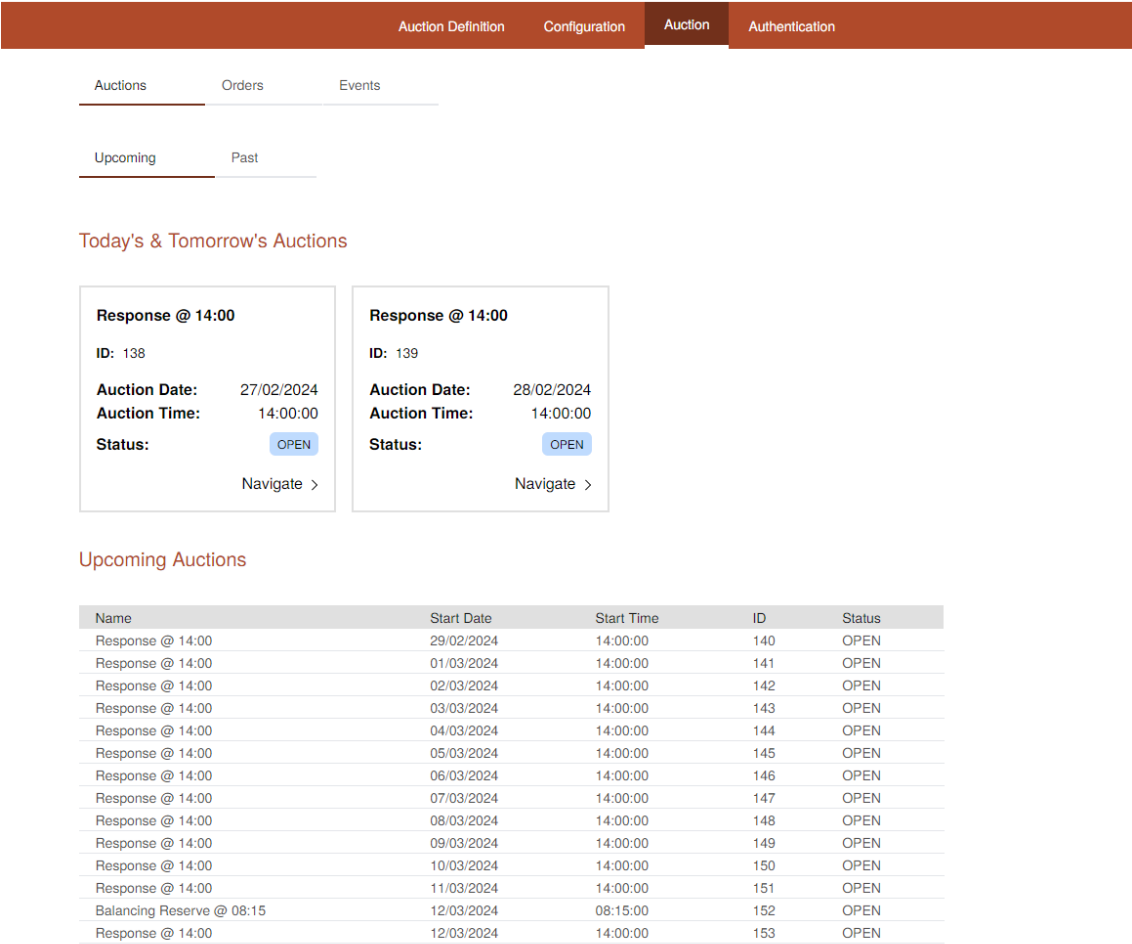


**Figure:** View of upcoming auctions

# Order Submission Process (EAC)

Baskets

No available Baskets.

**Add New Basket  >**

**Figure:** Button to create new basket

Unit:              Basket:
AG-DHD01B

Parent

Price
5

| Service | Volume |
|---------|--------|
| PBR | 50 |
| NBR | 0 |

Children

**Add Child +**

**Figure:** Adding parent and child orders to the basket

Balancing Reserve

Auction

Unit
AG-DHD01B

**Clone / Delete Baskets  >**

Baskets

| Identifier | Name | Family | Service Window |
|-----------|------|--------|----------------|
| 1085 | | | 1 |

**Add New Basket  >**

**Figure:** Adding parent and child orders to the basket (continued)

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# Performance Monitoring

# Availability: PBR

This section provides information on the application of the performance monitoring methodology for Balancing Reserve. Units participating in the service will be subject to performance monitoring on **Availability, Utilisation, Time to Full Delivery**, and **Dispatch Flexibility**. In the event of any conflict or inconsistency between this document and the Service Terms, the latter shall prevail.

**Performance Monitoring of Availability (EoD code "AVAL")**

A contracted unit should be able to demonstrate 100% of contracted Positive Balancing Reserve (headroom) or Negative Balancing Reserve (footroom). Failure to demonstrate the contracted availability will trigger an Event of Default (EoD). When a reserve unit triggers an EOD, it will forfeit the Availability Payment for all the relevant Contracted Windows.

## Positive Balancing Reserve

**For a generator (or a unit with only positive output):**

MEL – FPN $\geq$ Contracted Quantity

**For a supplier (or a unit with only negative output):**

SIL – FPN $\geq$ Contracted Quantity

**For a "through-zero" unit:**

MEL – FPN $\geq$ Contracted Quantity

**For a Power Park Module powered by an Intermittent Power Source:**

PA – FPN $\geq$ Contracted Quantity

## Negative Balancing Reserve

**For a generator (or a unit with only positive output):**

FPN – SEL $\geq$ Contracted Quantity

**For a supplier (or a unit with only negative output):**

FPN – MIL $\geq$ Contracted Quantity

**For a "through-zero" unit:**

FPN – MIL $\geq$ Contracted Quantity

**For a Power Park Module powered by an Intermittent Power Source:**

FPN – PA $\geq$ Contracted Quantity

*Dynamic Parameter definitions:*
*FPN – Final Physical Notification, MEL – Maximum Export Limit, SEL – Stable Export Limit,*
*MIL – Maximum Import Limit, SIL – Stable Import Limit, PA – Power Available.*

# Commercial Unavailability

## Performance Monitoring of Availability (EoD code "IVCP")

A contracted unit should be able to demonstrate 100% of contracted Positive Balancing Reserve (headroom) or Negative Balancing Reserve (footroom). Failure to demonstrate the contracted availability will trigger an Event of Default (EoD). When a reserve unit triggers an EoD, it will forfeit Availability Payment for all the relevant Committed Windows.

Where a unit fails the availability check we will determine whether the unit was Technically Unavailable or Commercially Unavailable.

Where the unit fails the availability check and is Commercially Unavailable then the **Incremental Volume Cost penalty** will be applied.

## Positive Balancing Reserve

### For a generator (or a unit with only positive output)

Where MEL − FPN ‹ Contracted Quantity and;

MEL − SEL ‹ Contracted Quantity → *Technical Unavailability;*

MEL − SEL ≥ Contracted Quantity → *Commercial Unavailability*

### For a supplier (or a unit with only negative output):

Where SIL − FPN ‹ Contracted Quantity and;

SIL − MIL ‹ Contracted Quantity → *Technical Unavailability;*

SIL − MIL ≥ Contracted Quantity → *Commercial Unavailability*

### For a "through-zero" unit:

Where MEL − FPN ‹ Contracted Quantity and;

MEL − MIL ‹ Contracted Quantity → *Technical Unavailability;*

MEL − MIL ≥ Contracted Quantity → *Commercial Unavailability*

### For a Power Park Module powered by an Intermittent Power Source:

Where PA − FPN ‹ Contracted Quantity and;

PA − SEL ‹ Contracted Quantity → *Technical Unavailability;*

PA − SEL ≥ Contracted Quantity → *Commercial Unavailability*

*Dynamic Parameter definitions:*
*FPN − Final Physical Notification, MEL − Maximum Export Limit, SEL − Stable Export Limit, MIL − Maximum Import Limit, SIL − Stable Import Limit, PA − Power Available.*

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# Commercial Unavailability

**Performance Monitoring of Availability (EoD code "IVCP")**

A contracted unit should be able to demonstrate 100% of contracted Positive Balancing Reserve (headroom) or Negative Balancing Reserve (footroom). Failure to demonstrate the contracted availability will trigger an Event of Default (EoD). When a reserve unit triggers an EoD, it will forfeit Availability Payment for all the relevant Committed Windows.

Where a unit fails the availability check we will determine whether the unit was Technically Unavailable or Commercially Unavailable.

Where the unit fails the availability check and is Commercially Unavailable then the **Incremental Volume Cost penalty** will be applied.

## Negative Balancing Reserve

### For a generator (or a unit with only positive output)

Where MEL − FPN < Contracted Quantity and;

MEL − SEL < Contracted Quantity → *Technical Unavailability*;

MEL − SEL ≥ Contracted Quantity → *Commercial Unavailability*

### For a supplier (or a unit with only negative output):

Where SIL − FPN < Contracted Quantity and;

SIL − MIL < Contracted Quantity → *Technical Unavailability*;

SIL − MIL ≥ Contracted Quantity → *Commercial Unavailability*

### For a "through-zero" unit:

Where MEL − FPN < Contracted Quantity and;

MEL − MIL < Contracted Quantity → *Technical Unavailability*;

MEL − MIL ≥ Contracted Quantity → *Commercial Unavailability*

### For a Power Park Module powered by an Intermittent Power Source:

Where PA − FPN < Contracted Quantity and;

PA − SEL < Contracted Quantity → *Technical Unavailability*;

PA − SEL ≥ Contracted Quantity → *Commercial Unavailability*

*Dynamic Parameter definitions:*
*FPN − Final Physical Notification, MEL − Maximum Export Limit, SEL − Stable Export Limit,*
*MIL − Maximum Import Limit, SIL − Stable Import Limit, PA − Power Available.*

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# Utilisation

This section provides information on the application of the performance monitoring methodology for Balancing Reserve. Units participating in the service will be subject to performance monitoring on **Availability**, **Utilisation, Time to Full Delivery**, and **Dispatch Flexibility**. In the event of any conflict or inconsistency between this document and the Service Terms, the latter shall prevail.

## Performance Monitoring of Utilisation

Under-delivery below 95% expected output will mean availability payments for the relevant service window will be withheld. Over-delivery is not penalised by the performance monitoring.

For units which are armed for Mandatory Frequency Response (MFR) or contracted for a dynamic response contract in the opposite direction their response energy delivered will adjust the Expected Output and ensure that units are not penalised for under-delivery when they are automatically adjusting output to manage frequency. This enables service stacking between BR and response services as per the "Service Stacking" guidelines.

**For all units**

**PBR:** Expected output = Positive net BOA volume (MWh)* + Response Energy (MWh)

**NBR:** Expected output = Negative net BOA volume (MWh)* + Response Energy (MWh)

**The Check**

**(Settlement metering – FPN volume) / Expected output ≥ 0.95**
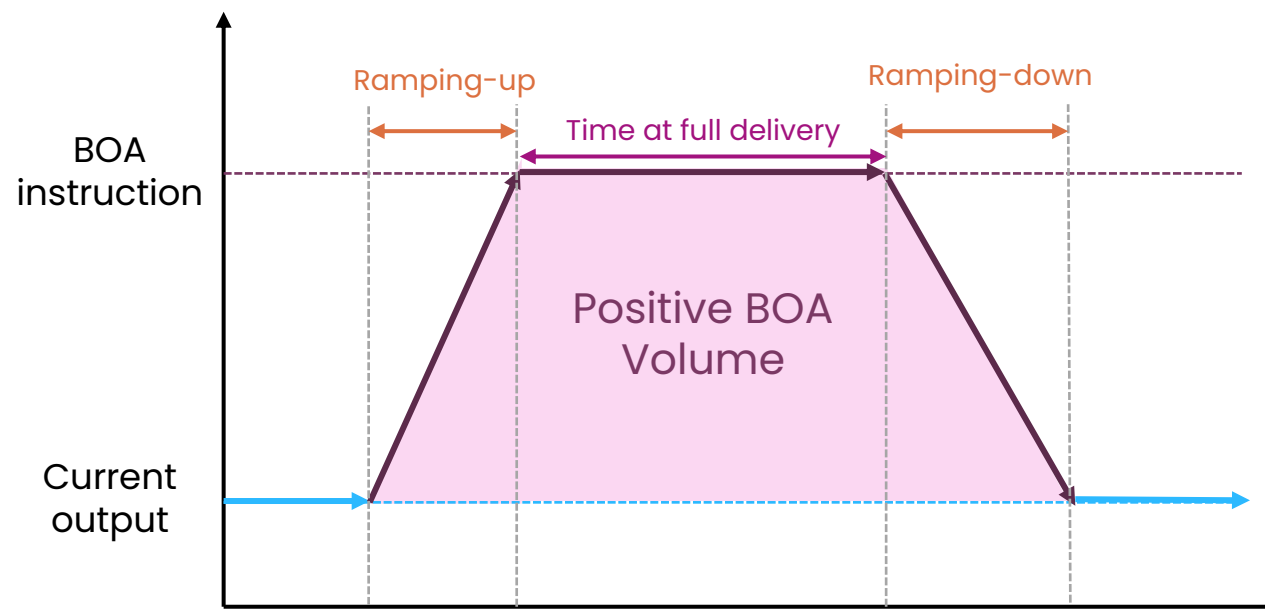


*If two or more BOAs in opposite directions are received in a Settlement Period, utilisation performance monitoring is on the net direction. If no contract is held in that direction, then no utilisation check is made.

*Dynamic Parameter definitions:*
*FPN – Final Physical Notification, MEL – Maximum Export Limit, SEL – Stable Export Limit, MIL – Maximum Import Limit, SIL – Stable Import Limit, PA – Power Available.*

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# Time to full delivery

This section provides information on the application of the performance monitoring methodology for Balancing Reserve. Units participating in the service will be subject to performance monitoring on **Availability**, **Utilisation,** , and **Dispatch Flexibility**. In the event of any conflict or inconsistency between this document and the Service Terms, the latter shall prevail.

### Performance Monitoring of Time to Full Delivery

A contracted unit must be capable of achieving the full contracted capacity within the Time to Full Delivery of 10 minutes this is inclusive of Notice to Offer (NTO) or Notice to Bid (NTB) parameters. Whilst NTO/NTB can be set as low as 0 minutes, the Grid Code allows an NTO/NTB of 2 minutes (see BC2.7.3).

Note that the contracted BR unit is also expected to cease delivery of the BOA within 10 minutes (NTO/NTB time does not apply in the cessation of the BOA).

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**Positive Balancing Reserve Example\***

**For a generator\*\* (or a unit with only positive output):**

Time to full delivery (minutes) = Contracted PBR capacity (MW) / Run up rate Export (MW/min)

**For a supplier (or a unit with only negative output):**

Time to full delivery (minutes) = Contracted PBR capacity (MW) / Run down rate Import (MW/min)

**For a bi-directional unit:**

(If FPN ≥ 0)

Time to full delivery (minutes) = Contracted PBR capacity (MW) / Run up rate Export (MW/min)

(If FPN < 0)

Time to full delivery (minutes) = Contracted PBR capacity (MW) / Run down rate Import (MW/min)

**The Check:**

**Time to Full Delivery + NTO\*\*\* ≤ 10 minutes**

\*Run up is replaced with run down and vice versa for Negative Balancing Reserve to calculate the time to full delivery.

\*\*Where units have multiple run-up or run-down rates then one, two or three rates are used for the relevant parts of the contracted quantity (where applicable) – see detailed example 3 for more information.

\*\*\*For NBR NTB will be used in place of NTO, where the unit is delivering from a 0MW FPM, NDZ will be used.

*Dynamic Parameter definitions:*
*FPN – Final Physical Notification, MEL – Maximum Export Limit, SEL – Stable Export Limit,*
*MIL – Maximum Import Limit, SIL – Stable Import Limit, PA – Power Available.*

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# Dispatch Flexibility

This section provides information on the application of the performance monitoring methodology for Balancing Reserve. Units participating in the service will be subject to performance monitoring on **Availability**, **Utilisation, Time to Full Delivery**, and **Dispatch Flexibility**. In the event of any conflict or inconsistency between this document and the Service Terms, the latter shall prevail.

### Performance Monitoring of Dispatch Flexibility

A contracted unit must be capable of being dispatched during contracted service windows in accordance with the following rules:

- being dispatched from any prevailing Stable Export Limit or Stable Import Limit (which for the avoidance of doubt may be 0MW) or from any other higher level of Output or Demand

- being dispatched for all or part of its Contracted Quantity and in one or multiple consecutive increments of one 1MW

- being dispatched for a single or multiple consecutive periods each of not less than 1 minute duration (representing a minimum activation period) which for these purposes shall exclude Ramping Periods

- Exceptions apply for units providing PBR from an FPN of 0, where the units may be dispatched from a SEL of up 25MW and for a period of up to 5 minutes as dictated by their MNZT

## Positive Balancing Reserve

### For a generator (or a unit with only positive output):

FPN ≥ SEL, or FPN = 0 and SEL ≤ 25 MW

### For a supplier (or a unit with only negative output):

No additional check required*

### For a "through-zero" unit:

If FPN > 0, FPN ≥ SEL,

If FPN = 0 then SEL ≤ 25 MW

If FPN < 0**, SIL = 0,-1 and SEL = 0,1

*BR contracted providers delivering from a negative FPN should ensure that their SIL does not impede their ability to be flexibly dispatched for all or part of the contracted quantity – this capability will be monitored via the availability check.

**When prequalifying for Balancing Reserve providers will self-declare whether they are a generator, supplier or a "through-zero" unit. If declared as a through-zero unit SIL <u>and</u> SEL should routinely be 0,1 or -1 to avoid failing this check when delivering BR from an FPN<0.

*Dynamic Parameter definitions:*
*FPN – Final Physical Notification, MEL – Maximum Export Limit, SEL – Stable Export Limit,*
*MIL – Maximum Import Limit, SIL – Stable Import Limit, PA – Power Available.*

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- being dispatched for all or part of its Contracted Quantity and in one or multiple consecutive increments of one 1MW

- being dispatched for a single or multiple consecutive periods each of not less than 1 minute duration (representing a minimum activation period) which for these purposes shall exclude Ramping Periods.

- Exceptions apply for units providing NBR from an FPN of 0, where the units may be dispatched from a SEL of up 25MW and for a period of up to 5 minutes as dictated by their MNZT

## Negative Balancing Reserve

### For a generator (or a unit with only positive output):

No additional check required*

### For a supplier (or a unit with only negative output):

$FPN \leq SIL$, or $FPN = 0$ and $SIL \geq -25$

### For a "through-zero" unit:

If $FPN > 0$, $SIL = 0, -1$ and $SEL = 0, 1$

If $FPN = 0$ then $SIL \geq -25$

If $FPN < 0$, $FPN \leq SIL$

*BR contracted providers delivering from a positive FPN should ensure that their SEL does not impede their ability to be flexibly dispatched for all or part of the contracted quantity – this capability will be monitored via the availability check.

***Dynamic Parameter definitions:***
*FPN – Final Physical Notification, MEL – Maximum Export Limit, SEL – Stable Export Limit,*
*MIL – Maximum Import Limit, SIL – Stable Import Limit, PA – Power Available.*

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# Incremental Volume Cost (IVC)

The IVC is a penalty amount levied on BR contracted units which are determined by NESO to have failed the BR availability checks due to reasons of Commercial Unavailability.

The IVC is calculated in accordance with the formula in the BR service terms and NESO interpretation where the service terms are not specific.

There are two IVCs calculated for each Settlement Period – one which applies to PBR contracts deemed to be commercially unavailable and one for NBR contracts deemed to be commercially unavailable.

| "Incremental Volume Cost" | for a **Settlement Period**, the amount calculated as the higher of: <br><br> (1) (A multiplied by B multiplied by 0.5) minus C <br><br> and <br><br> (2) zero <br><br> Where: <br><br> A is the highest accepted **Offer Price** or **Bid Price** in the **Balancing Mechanism** in that **Settlement Period** (ignoring any system-tagged **Bid-Offer Acceptance** and any **Bid-Offer Acceptance** issued in error), or (if higher) any price for that **Settlement Period** agreed by **NGESO** and its counterparty pursuant to a grid trade under a Grid Trade Master Agreement; <br><br> B is the **Contracted Quantity**; <br><br> C is the settlement value calculated for that **Settlement Period** pursuant to Schedule 2 to these **BR Service Terms** which would otherwise have been payable to the **Service Provider** but for the operation of paragraph 15.2 and Schedule 2 to these **BR Service Terms**; |
|---|---|

**Figure:** Excerpt from BR Service Terms

# Incremental Volume Cost (IVC)

**Rules for calculating Incremental Volume Cost for NBR:**

1) Only consider actions from the **Sell Stack** for NBR - these are the actions with a negative volume.

2) As Negative bid prices are expensive for NESO we should search for the **lowest price** in the sell stack.

3) Remove all system flagged bids.

4) Remove actions that have flowed through from DISBSAD (Sell trades on the interconnectors taken by ESO for energy reasons).

5) Remove actions taken in error (where DMAT is set to 0).

6) Adjust the figure to be a £/MW/SP rather than £/MWh.

7) Subtract the clearing price for NBR from the result and floor at £0.

**Rules for calculating Incremental Volume Cost for PBR:**

1) Only consider the actions from the **Buy Stack** for PBR – these are the actions with a positive volume.

2) As Positive offer prices are expensive for NESO we should search for the **highest price** in the buy stack.

3) Remove all system flagged offers.

4) Remove actions that have flowed through from DISBSAD (Trades and NBM actions from OFR via PAS dispatches). Although trades could be included, they only set the PBR IVC 0.5% of the time, so we have decided to remove all trading actions.

5) Remove actions taken in error (where DMAT is set to 0).

6) Adjust the figure to be a £/MW/SP rather than a £/MWh.

7) Subtract the clearing price for PBR from the result and floor at £0.

## 8) If the IVC for the half hour ends up being higher than £500/MW/SP, cap it at £500/MW/SP.

# Operational Data

# Pre Gate Closure Data

- Contracted Balancing Reserve providers need to submit BM data to NESO via EDL/EDT. This data should be submitted in accordance with the Grid Code (BC1 and BC2).

- NESO engineers calculate the expected operating margin repeatedly between 24 hours and 4 hours ahead of real time. These margin assessments provide key information to notify dispatch engineers that warming instructions are needed to synchronise cold plant and ensure reserve is available in real time.

- The introduction of Balancing Reserve means that some contracted reserve volume is known at 14:30 the Day Ahead of delivery and therefore these contracted volumes will be included in the engineer's margin assessments.

- To help us to ensure the margin assessments are as accurate as possible we would appreciate contracted BM units submitting Day Ahead Submissions even when not mandated to do so by the Grid Code.

- Data should then be revised if new information becomes available to the BM Participant.

**Reminder of BM data relevant for Balancing Reserve:**

Maximum Export Limit (MEL)

Maximum Import Limit (MIL) [if applicable]

Stable Export Limit (SEL)

Stable Import Limit (SIL) [if applicable]

Run-up Rate/s

Run-down Rate/s

Minimum Non-Zero Time (MNZT)

Minimum Zero Time (MZT)

Bid/Offer pairs

Notice to Offer (NTO)

Notice to Bid (NTB)

Notice to Deviate from Zero (NDZ)

# Energy Limited Assets

Battery Energy Storage Systems (BESS) and Pumped Storage have energy limitations depending on the storage capacity of their equipment. BESS can participate in the BR auctions but are expected to be able to manage their state of energy to be able to deliver the full contracted quantity for the duration of the BR service window. Failure to do this could result in an IVC penalty.

**We have published guidance on the submission of MEL/MIL parameters for energy limited assets, please read this guidance note to learn more.**

This approach is designed to be temporary whilst the GC0166 working group design new parameters for storage. More information on this Grid Code modification proposal can be found here.

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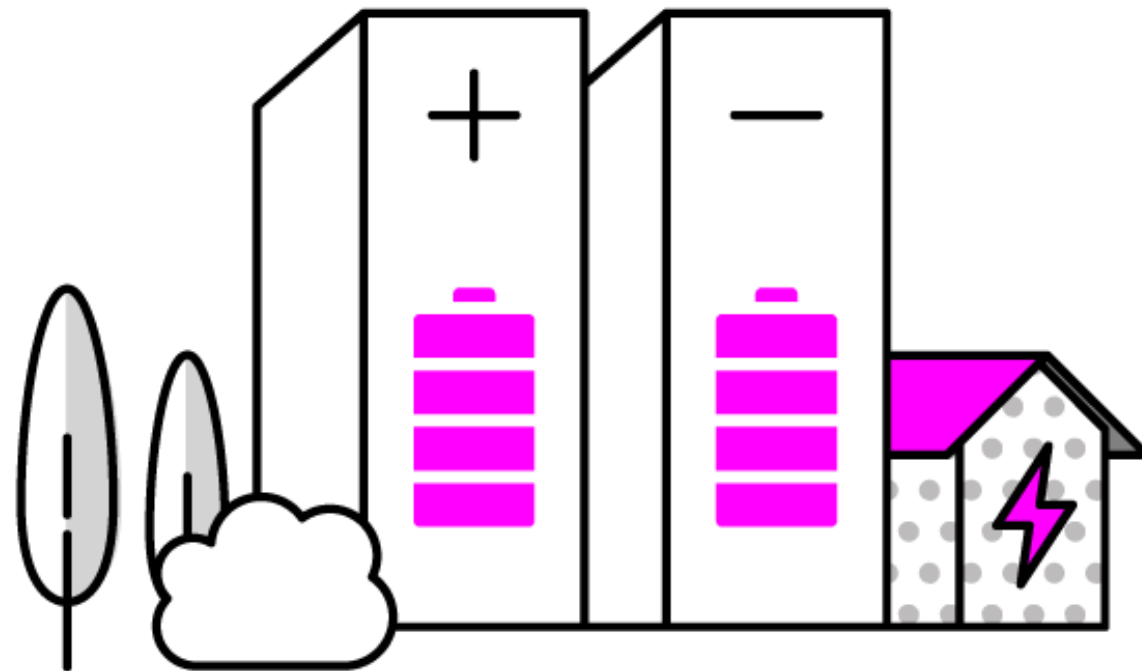
# Energy Limited Assets

## Submitting MEL/MIL – interactions with the 30-minute rule

The 30-minute MEL/MIL redeclaration rule guidance recommends that:

- Battery BMUs should declare their MEL and MIL open-ended such that it reflects the capacity to follow a Bid Offer Acceptance (BOA) which ramps from the current Physical Notification (PN) to the MEL or MIL and remains at the MEL or MIL for a duration of 30 minutes before ramping back to the Physical Notification. Ramping rate to be the RunUp Rate (RUR) or Run-Down Rate (RDR) as applicable.

- If a BOA is issued to MEL/MIL, the State of Energy should be recalculated, and the MEL or MIL should be redeclared as soon as possible starting from the point at which the current MEL/MIL level could not be sustained if the BOA were to be extended. This redeclaration will be a minimum of 32 minutes from the first point of instruction (30 minutes duration and 1- minute ramp either side) but may be longer.

When holding a reserve contract, and state of energy changes within the contracted period, following this guidance absolutely may cause the unit to fail reserve availability performance monitoring.

We recommend adding a bullet point to this rule:

- *Where the energy limited BMU holds a firm Reserve contract (Balancing, Quick or Slow Reserve) and has sufficient energy remaining to deliver the contracted capacity for the remainder of the service window then the MEL/MIL redeclaration should indicate this capability and be reduced on the settlement period boundary to reflect a future 30-minute capability for dispatch. This approach avoids incorrect failing of the firm Reserve contract when the BMU has enough energy remaining to deliver for the remainder of the contracted window.*

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# Energy Limited Assets

## Submitting MEL/MIL – interactions with he 30-minute rule and PBR/PWR monitoring
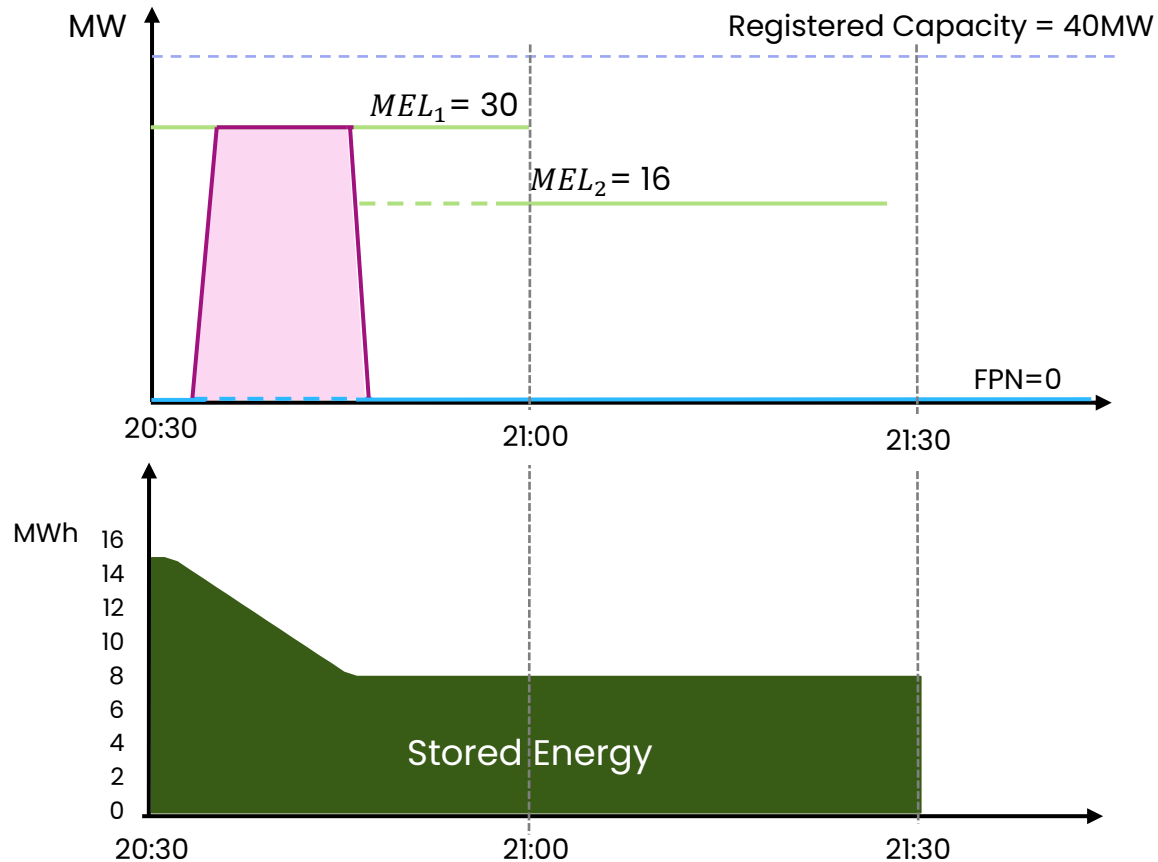


This BMU needs to have at least 15MWh of stored energy in the battery at 20:30 to deliver a 30MW Offer for 30 minutes (as per the BR contract).

**In this example:**

The unit has 15MWh of stored energy at 20:30.

It receives and delivers on an Offer for 30MW for 13 minutes (including a 1-minute ramp on either side).

Under the 30-minute rule the unit would submit a new MEL* (16MW) to be effective from 20:47 to reflect its new 30-minute capability.

This causes the unit to fail reserve contract performance monitoring, despite the unit having adequately managed its state of energy at the start of the contracted period.

**We recommend that reserve contracted units should delay the effective from time of their revised MEL to the start of the next SP.**

# Data and Transparency

**Registered Service Providers will be required to submit Operational Data, as outlined in the Service Terms.**

No performance data needs to be submitted by contracted BR providers, NESO will use its own data to performance monitor the units at a 30-minute granularity. Operational data should be submitted via BM systems (e.g. EDT/EDL).

Details of the BR auction results including a breakdown of each Sell Order, NESO's Buy Order and results summaries is available on the data portal

EAC- Auction Results | National Energy System Operator

Details of unit dispatch can be found via the Dispatch Transparency dataset or through the Elexon website.

# Get in touch

Email us with your views on this guidance document:

box.futureofbalancingservices@neso.energy

And one of our team members will get in touch

Access our current Reserve documents here:

Balancing Reserve

Quick Reserve

Slow Reserve

Short Term Operating Reserve

Connect with us on social media:

X

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# Appendix

# A. Performance Monitoring – Examples

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# Example 1 – using price bands to manage state of energy (30-minute rule)
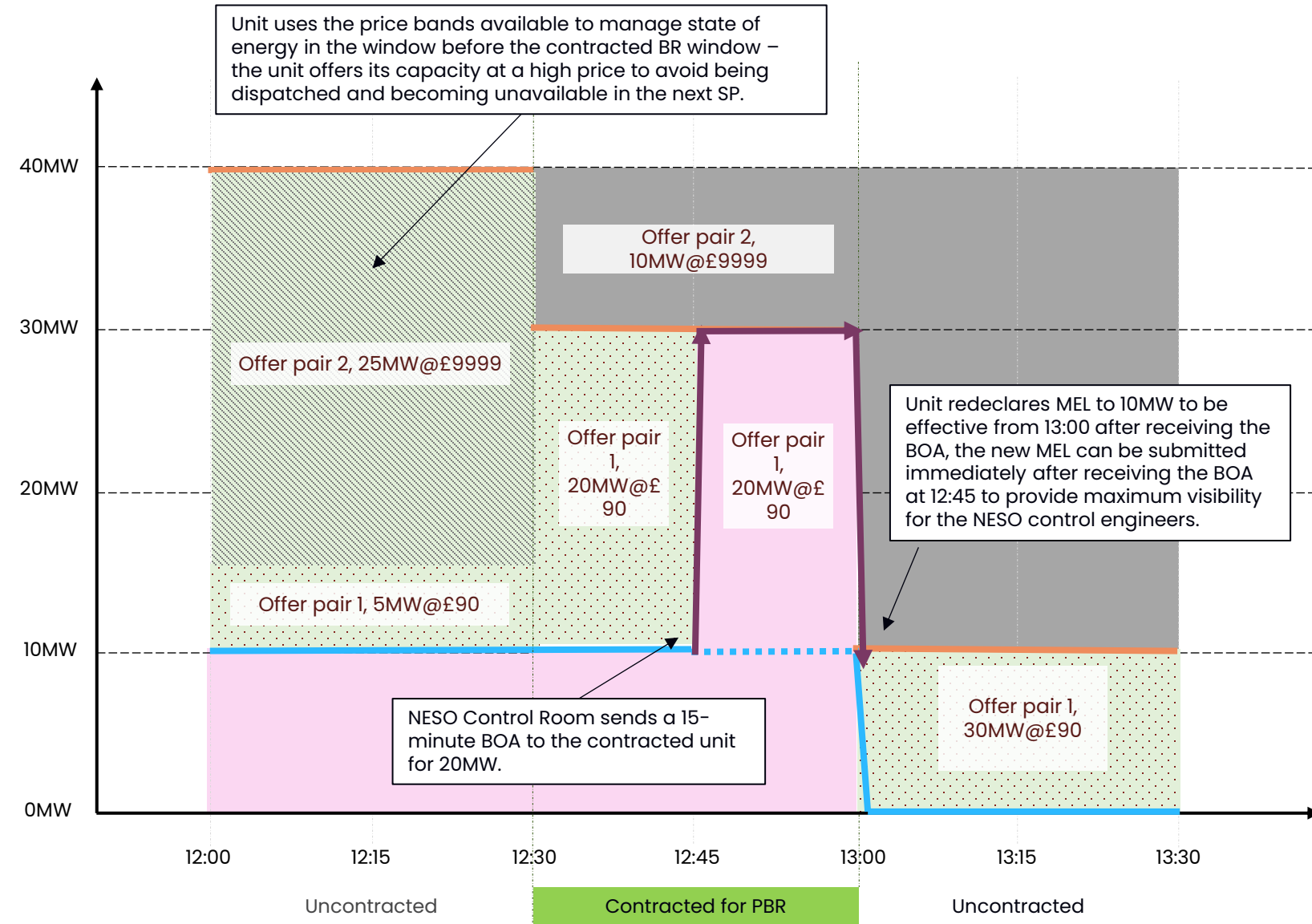


Unit uses the price bands available to manage state of energy in the window before the contracted BR window – the unit offers its capacity at a high price to avoid being dispatched and becoming unavailable in the next SP.

Offer pair 2, 10MW@£9999

Offer pair 2, 25MW@£9999

Offer pair 1, 20MW@£90

Offer pair 1, 20MW@£90

Offer pair 1, 5MW@£90

Unit redeclares MEL to 10MW to be effective from 13:00 after receiving the BOA, the new MEL can be submitted immediately after receiving the BOA at 12:45 to provide maximum visibility for the NESO control engineers.

NESO Control Room sends a 15-minute BOA to the contracted unit for 20MW.

Offer pair 1, 30MW@£90

Uncontracted · Contracted for PBR · Uncontracted

**Legend:** FPN, MEL, BOA, Delivered energy, Available for BOA

**Unit characteristics**
- The BESS has a maximum generation capacity (GC) of 40MW.
- The unit has submitted a run up rate of 40MW/minute. (although is assumed to ramp instantaneously)
- The unit does not have any response contracts.
- The unit is contracted for 20MW of Positive Balancing Reserve in BR Service Window 28.
- **At 12:00 the unit has 20MWh of stored energy available for discharge.**
- Settlement metering for SP26 (12:30 – 13:00) = 9.9MWh (a small under delivery)

**Unit revenue**
- The clearing price for SP26/SW28 in the DA BR auction was £15/MW/hour. For the contracted window the provider expects to be paid (£15*20)/2 = £150.
- The offer price of £9999/MWh for Offer pair 2 protects the provider from incurring an IVC penalty for not having available PBR capacity in SW28 due to state of energy limitations.

# Example 1 – performance monitoring

**Performance check (PBR) SP26:**

*Availability*
→ MEL − FPN ≥ 20MW
→ (30 − 10) ≥ 20
→ **CORRECT**

*Utilisation*
→ Settlement Metered volume − FPN volume >= Expected Output*0.95
→ 9.9 − 5 ≥ (5)*0.95
→ **CORRECT**

*Time to full delivery*
→ Contracted quantity / Run up Rate + NTO <= 10 minutes
→ (20 / 40) + 2 <= 10
→ 2.5 <= 10
→ **CORRECT**

*Flexible dispatch*
→ FPN ≥ SEL (if FPN >0)
→ SEL= 0MW for this BESS BMU
→ **CORRECT**

This unit has slightly underdelivered: Settlement Metering = 9.9MWh but FPN + Offer volume = 10MWh. However, this is within the 5% tolerance and so there is no impact on the units' availability payments for BR. Any BOA under delivery may still be penalised under the BSC.

**Unit revenue**
- The unit passed all 4 of the performance monitoring checks.
- BR Availability payment = £150
- BM Offer payment = 20MW*0.25hour*£90/MWh = £450

- Total revenue (BOA + BR availability payments) from 12:00 – 13:30 = £600

# Example 2 – Commercial Unavailability and the Incremental Volume Cost (IVC)

The BESS has only priced its upwards volume within 1 price band. It is dispatched for its full volume for 18 minutes.

Previous MEL had reflected 30 minutes of capacity + planned generation within that next 30 minutes

Unit resubmits MEL as the stored energy in the BESS is reduced. This means that the unit is no longer able to provide the full contracted Positive BR in SP26. The "30-minute" MEL shows the capability of the unit to deliver a 30-minute BOA for the next 30 minutes based on the remaining stored energy in the BESS.

Offer pair 1, 40MW @£90

Offer pair 1, 40MW@£90

Offer pair 1, 40MW@£90

The gap between MEL and MIL shows the total available capacity of the unit as this unit can deliver BR Through-Zero.

Uncontracted

Contracted for PBR

Uncontracted

**Unit characteristics**
- The BESS has a maximum generation capacity (GC) of 40MW.
- The unit has submitted a run up rate of 40MW/minute. (although is assumed to ramp instantaneously)
- The unit does not have any response contracts.
- The unit is contracted for 20MW of Positive Balancing Reserve in BR Service Window 28.
- At 12:00 the unit has 20MWh of stored energy available for discharge.
- Settlement metering for SP26 (12:30 – 13:00) = 0MWh

FPN

MEL

BOA

Delivered energy

Available for BOA

**Unit revenue**
- The clearing price for SP26/SW28 in the DA BR auction was £10/MW/hour. For the contracted window the provider expects to be paid (£10*20)/2 = £100.
- The offer the unit received at 12:00 allowed total revenue of 40*0.3*£90 = £1,080.

# Example 2 – performance monitoring

**Performance check (PBR) SP26:**

*Availability*
  → MEL − FPN ≥ 20MW
  → (16 − 0) ≥ 20
  → **INCORRECT**

*Availability Type Check (only conducted when a unit fails the Availability Check)*
  → If MEL − MIL ≥ 20MW
  → 16 − (−40) ≥ 20
  → 56 ≥ 20 → **COMMERCIAL UNAVAILABILITY**

If a unit is deemed to be commercially unavailable for BR, then the Incremental Volume Cost (IVC) penalty is applied.

*Utilisation* → **PBR NOT CHECKED**

***Time to full delivery*** → **CORRECT**

*Flexible dispatch* → **CORRECT**

**Unit revenue**
- The unit failed the check on availability. 100% of the BR availability is withheld.

- BR Availability payment = £0

- Incremental Volume Cost for PBR was calculated as £55/MW/SP for this SP.

- Total IVC charge = £55*20 = −£1100

- BM Offer payment = £1,080

- Total revenue from BR & BM from 12:00 – 13:30 = **−£20**

**Note:**
To avoid incurring this penalty charge the unit should structure price bands to avoid being dispatched in the uncontracted window immediately before their contracted window.
It may be difficult to price in the impact of an IVC penalty charge as it is calculated ex post based on actions taken within the specific settlement period in question.

# Example 3 – contracted response capability (30 minute rule)
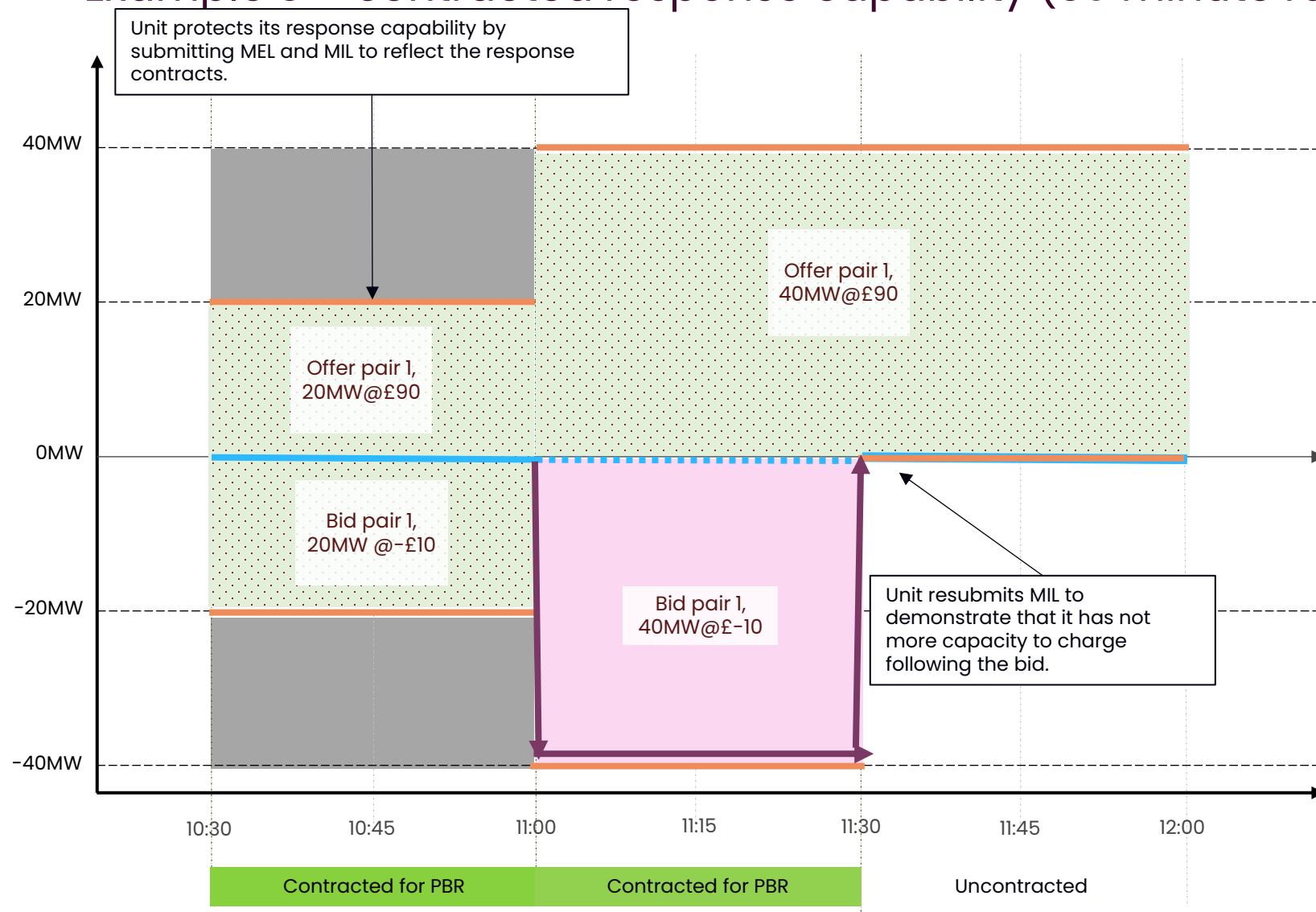


Unit protects its response capability by submitting MEL and MIL to reflect the response contracts.

Offer pair 1, 40MW@£90

Offer pair 1, 20MW@£90

Bid pair 1, 20MW @-£10

Bid pair 1, 40MW@£-10

Unit resubmits MIL to demonstrate that it has not more capacity to charge following the bid.

**Unit characteristics**
- The BESS has a maximum generation capacity (GC) of 40MW.
- The unit has submitted a run up and run down rate of 40MW/minute. (although is assumed to ramp instantaneously)
- The unit has a DCL and DCH contract for EFA 3 each for 15MW.
- The unit is contracted for 20MW of Positive Balancing Reserve in BR Service Window 25.
- At 10:30 the unit has 20MWh of stored energy available for discharge.
- Settlement metering for SP22 (10:30 – 11:00) = 0MWh [high and low response contracts cancel each other out in this example]
- Settlement metering for SP23 (11:00 – 11:30) = -20MWh

| FPN | Delivered energy |
| MEL | Available for BOA |
| BOA | |

Contracted for PBR | Contracted for PBR | Uncontracted

# Example 3 – contracted response capability (30 minute rule)

**Performance check (PBR) SP23:**

*Availability*
→ MEL − FPN ≥ 20MW
→ (40 − 0) ≥ 20
→ **CORRECT**

*Utilisation*
→ Settlement Metered volume >= (BOA + FPN volume)*0.95
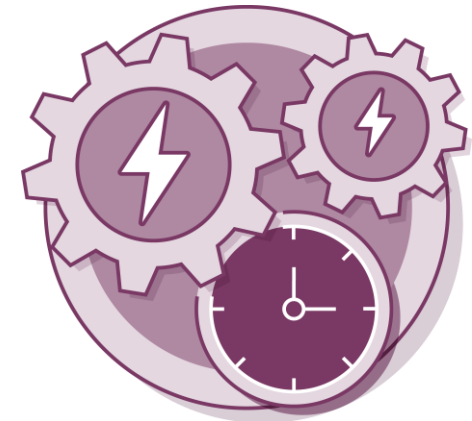→ net negative BOA volume → **PBR NOT CHECKED**

*Time to full delivery*
→ Contracted quantity / Run up Rate + NTO <= 10 minutes
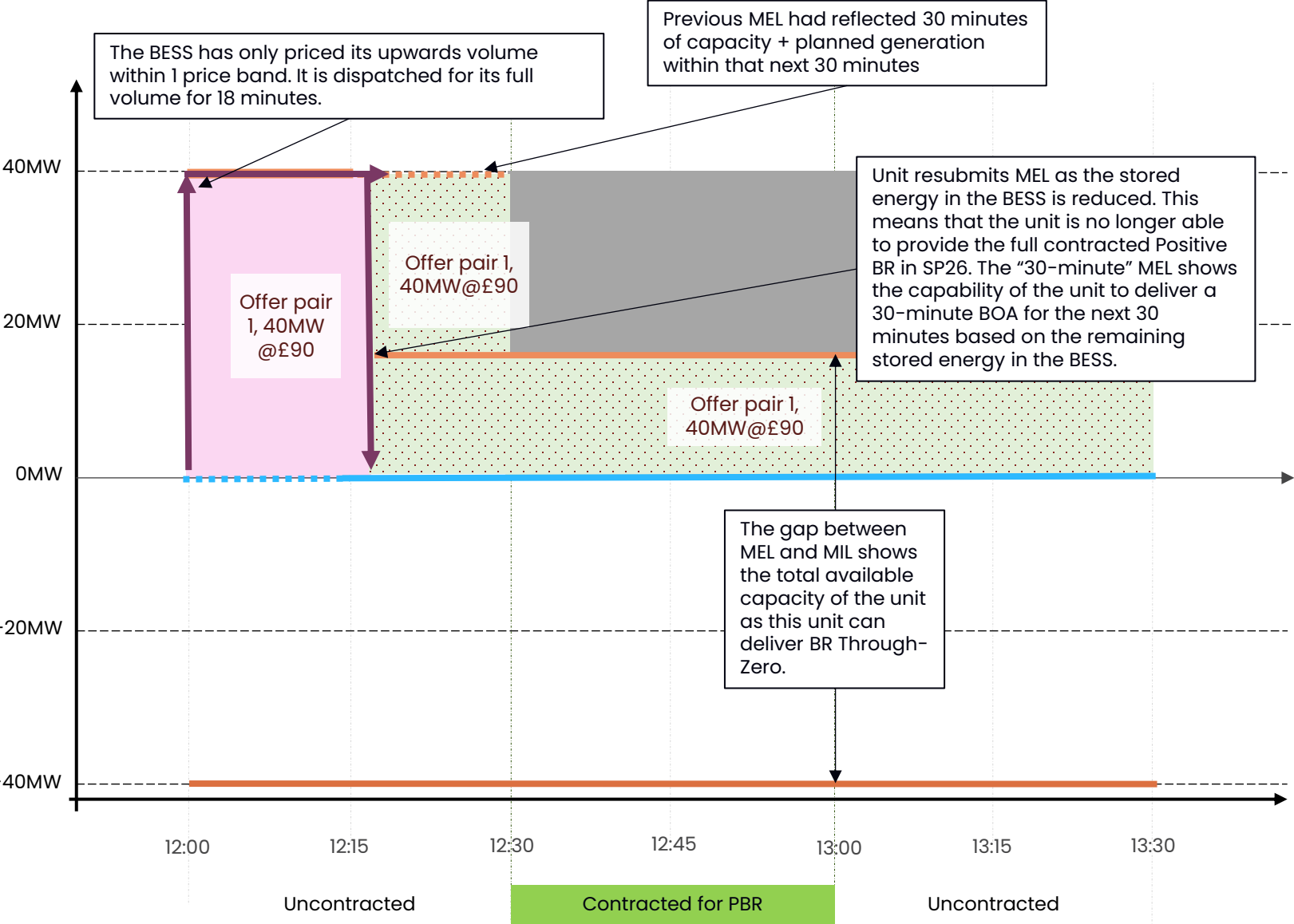→ (20 / 40) + 2 <= 10
→ 2.5 <= 10
→ **CORRECT**

*Flexible dispatch*
→ FPN ≥ SEL (if FPN >0)
→ SEL= 0MW for this BESS BMU
→ **CORRECT**

**Unit revenue**
- The unit passed all 4 of the performance monitoring checks.
- BR Availability payment = £270
- BM bid payment = -40MW*0.5hour*-£10/MWh = £200
- DCL revenue for 10:30 − 11:00 = 15MW*0.5hour*£0.58/MW/hr = £4.35
- DCH revenue for 10:30 − 11:00 = 15MW*0.5hour*£1.98/MW/hr = £14.85

- Total revenue from ESO from 10:30 − 12:00 = £489.20

# Example 4 – ramp rate checks



The unit spends 10 minutes ramping at 1.3MW/minute until it reaches Elbow 3 (233MW). Followed by 3 minutes ramping at 30MW/minute until it reaches the BOA flat top.

Offer pair 1, 180MW@£87

Offer pair 1, 180MW@£87

Bid pair 1, 20MW@£25

The unit is armed for MFR at 13:00, the response energy delivered is adjusted against the FPN before comparison against the expected output. This adjustment is made using Applicable Balancing Services Volume Data (ABSVD).

Run up Rate 3

2

Run up Rate 1

400MW
300MW
200MW
100MW
0MW

12:00   12:15   12:30   12:45   13:00   13:15   13:30

Contracted for PBR   Contracted for PBR   Contracted for PBR

**Unit characteristics**
- This CCGT unit has a maximum generation capacity of 400MW and a SEL of 200MW.
- The unit is contracted for 50MW of Positive BR
- Settlement metering for SP25 (12:00 – 12:30) = 110MWh
- Settlement metering for SP26 (12:30 – 13:00) = 139.08 (2dp)MWh
- Settlement metering for SP27 (13:00 – 13:30) = 161.5MWh
- ABSVD for SP27 (13:00 – 13:30) = 5MWh

Ramp Rates and Elbow Points:
- Run up Rate 1: 10MW/min (0 – 200)
- Run up Rate 2: 1.3MW/min (200 – 233)
- Run up Rate 3: 30MW/min (233 – 400)

Where run up Elbow 2 is 200 and Elbow 3 is 233.

—————— FPN

—————— MEL

—————→ BOA

Delivered energy

Available for BOA
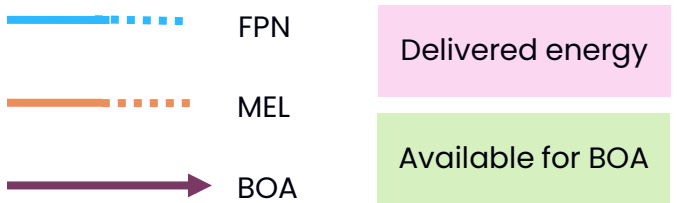
# Detailed example 4 – ramp rate checks

**Performance check (PBR) SP25, 26, 27**

Availability
→ MEL − FPN ≥ 50MW
→ (400 − 220) ≥ 50
→ **CORRECT**

Time to full delivery
→ Contracted quantity at Rate 2 / Run up Rate 2 + Contracted quantity at Rate 3 / Run up Rate 3 + NTO <= 10 minutes
→ (13 / 1.3) + (37 / 30) + 2 <= 10
→ 13.23̇ <= 10
→ **INCORRECT**

Flexible dispatch
→ FPN ≥ SEL (if generator)
→ 220 ≥ 200
→ **CORRECT**

**Unit revenue**
- The total PBR contracted volume of 50 is split across 2 run up rates.
- This unit has overcommitted PBR volume achievable in 10 minutes from its 220MW FPN. It would have been better off operating from an FPN >=233 where it could take advantage of its faster ramp rates.
- The unit will not receive availability payment for the PBR contract in any of the contracted windows.

**Performance check (PBR) SP25**
*Utilisation*
→ Expected output = 0
→ **NOT CHECKED**

**Performance check (PBR) SP26**
*Utilisation*
→ Settlement metering − FPN volume ≥ Expected output * 95%
→ 139.08 − 110 ≥ −29.08*0.95
→ **CORRECT**

**Performance check (PBR) SP27**
*Utilisation*
→ ABS(161.5 − (110 + 5)) ≥ ABS(51.5*0.95)
→ **CORRECT**

**ABSVD volume has been applied to make an adjustment to the FPN volume. This removes the effect of response energy from the check.**

# Detailed example 5 – dispatch flexibility
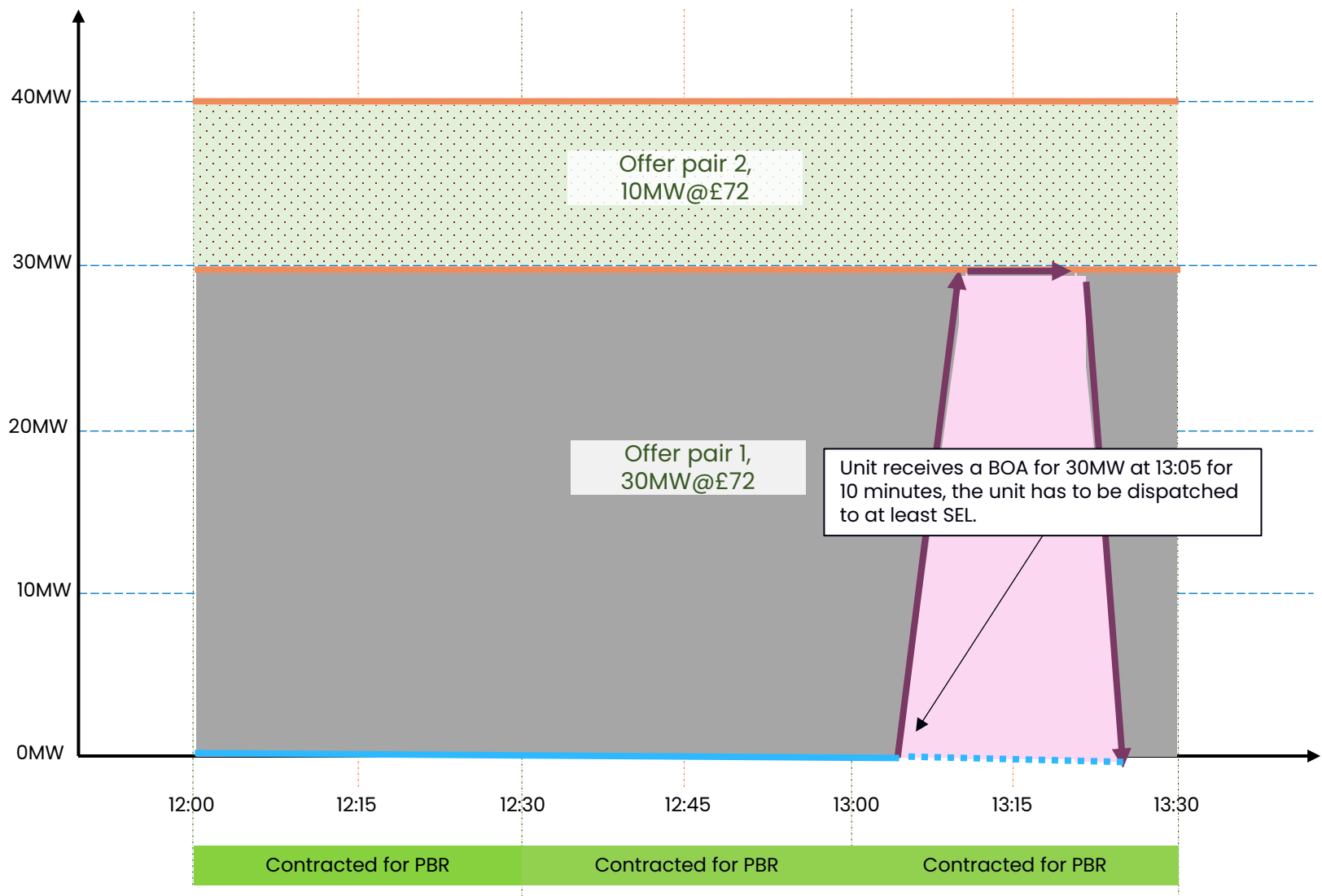


**Unit characteristics**
- This BM unit has a maximum generation capacity of 40MW and a SEL of 30MW.
- The unit has submitted a run up and run down rate of 8MW/minute.
- The unit is contracted for 10MW of Positive Balancing Reserve
- Settlement metering for SP25 (12:00 – 12:30) = 0MWh
- Settlement metering for SP26 (12:30 – 13:00) = 0MWh
- Settlement metering for SP27 (13:00 – 13:30) = 3.2MWh

Offer pair 2, 10MW@£72

Offer pair 1, 30MW@£72

Unit receives a BOA for 30MW at 13:05 for 10 minutes, the unit has to be dispatched to at least SEL.

Contracted for PBR   Contracted for PBR   Contracted for PBR

FPN

MEL

BOA

Delivered energy

Available for BOA
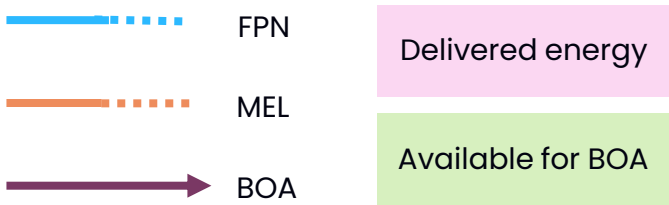
# Detailed example 5– dispatch flexibility

**Performance check (PBR) SP25, 26, 27**

Availability
→ MEL − FPN ≥ 10MW
→ (40 − 0) ≥ 10
→ **CORRECT**

Time to full delivery
→ Contracted quantity / Run up Rate + NTO <= 10 minutes
→ (10 / 8) + 2 <= 10
→ 3.25 <= 10
→ **CORRECT**

Flexible dispatch
→ FPN ≥ SEL (if generator)
→ 0 ≥ 30
→ **INCORRECT**

**Performance check (PBR) SP25, 26**
*Utilisation*
→ Expected output = 0
→ **NOT CHECKED**

**Performance check (PBR) SP27**
*Utilisation*
→ 3.2 − 0 ≥ 3.2*0.95
→ **CORRECT**

**Unit revenue**
- This unit has failed the dispatch flexibility check as it cannot be dispatched incrementally between its FPN of 0MW and its SEL of 30MW. This means that the contracted reserve is not flexible.
- The unit should deliver Positive Balancing Reserve from its SEL of 30MW, it could then be incrementally dispatched between FPN=SEL=30MW and its MEL of 40MW.
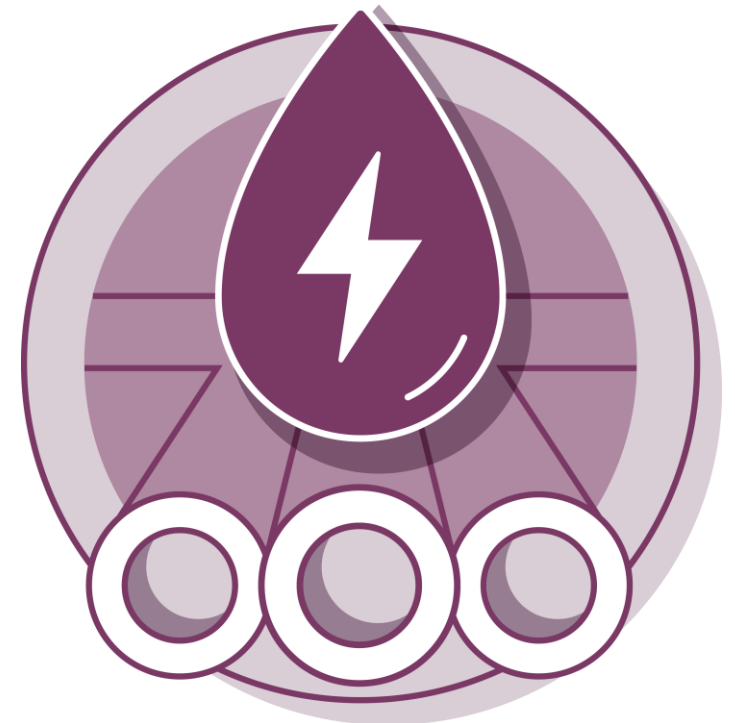- The unit will not receive availability payment for the PBR contract in any of the contracted windows.

# B. Acronyms

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# Acronyms

| | | | | |
|---|---|---|---|---|
| ABSVD | Applicable Balancing Services Volume Data | D* | DCH, DCL, DMH, DML, DRH and DRL collectively |
| API | Application Program Interface | DA | Day Ahead |
| AVAL | Settlements Code for Availability | DCH/DCL | Dynamic Containment High/Low |
| BESS | Battery Energy Storage Systems | DEP | Digital Engagement Platform |
| BM | Balancing Mechanism | DMAT | De Minimus Acceptance Threshold |
| BMU | Balancing Mechanism Unit | DMH/DML | Dynamic Moderation High/ Low |
| BOA | Bid Offer Acceptance | DRH/DRL | Dynamic Regulation High/Low |
| BOD | Bid Offer Data | EAC | Enduring Auctions Platform |
| BR | Balancing Reserve | EBGL | European Balancing Guidelines |
| BSC | Balancing and Settlements Code | EDL | Electronic Data Logging |
| CCGT | Combined Cycle Gas Turbine | EDT | Electronic Data Transfer |

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# **Acronyms**

| | | | | |
|---|---|---|---|---|
| EFA | Electricity Forward Agreement | | OBP | Open Balancing Program |
| EoD | Event of Default | | PA | Power Available |
| GC | Grid Code | | PN | Physical Notification |
| FPN | Final Physical Notification | | QR | Quick Reserve |
| IVC | Incremental Volume Cost | | SEL | Stable Export Limit |
| IVCP | Settlements Code for IVC Penalty | | SIL | Stable Import Limit |
| MEL | Maximum Export Limit | | SMP | Single Markets Platform |
| MIL | Maximum Import Level | | SP | Settlement Period |
| MNZT | Minimum Non-Zero Time | | SR | Slow Reserve |
| MZT | Minimum Zero Time | | STOR | Short Term Operating Reserve |
| NTB | Notice to Bid | | SW | Service Window |
| NTO | Notice to Offer | | SEL | Stable Export Limit |

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