

Balancing Reserve

Pricing Proposal

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Context

This pricing proposal is submitted under the methodology approved by the Authority on 20th May 2022¹. It references argument and analysis submitted to the Authority by the ESO in December 2019 to seek a derogation from the requirements under Article 6(4) for Balancing Mechanism activations for the purposes of energy balancing.

This is particularly relevant for the Balancing Reserve service as dispatch of contracted service providers will be undertaken through Bid Offer Acceptances (BOAs) through the Balancing Mechanism (BM). Prior to the introduction of day ahead procurement of Balancing Reserve, reserve holding for balancing purposes and activation of held reserves has been achieved solely through the BOAs in real time.

Therefore, it is recommended to read the arguments put forward in the Appendix to the December 2019 Art 6(4) derogation request² (henceforth referred to as the “Dec 2019 request”) alongside this pricing proposal pro forma. The Dec 2019 request assessed BM actions against the following criteria: homogeneity, competition and perfect/full information as well as providing useful supporting evidence on implementation costs and ESO strategy.

All evidence and assumptions used for the analysis in the Dec 2019 request have been considered and where there is reason to believe that they may no longer be valid this has been noted and addressed.

Pricing Proposal – Balancing Reserve

Criteria	Assessment
Homogeneity	<p><i>Balancing Reserve utilisation is not homogeneous.</i></p> <p>Control room engineers will consider the following factors <i>alongside</i> submitted utilisation prices when dispatching units to deliver balancing reserve:</p> <ul style="list-style-type: none"> • Speed of delivery

¹ Ofgem Decision Letter, (May 2022), Decision to approve proposal from the Electricity System Operator for an alternative pricing methodology for settlement of balancing energy for specific balancing products (nationalgrideso.com)

² <https://www.nationalgrideso.com/document/188141/download>

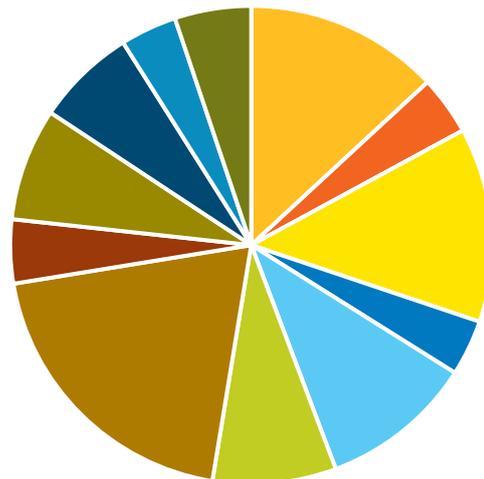
	<p>Faster ramping units may be more effective at solving real time energy imbalances than slow ramping units.</p> <ul style="list-style-type: none"> • Duration of Service It may be more economic to instruct a shorter duration unit or a longer duration unit depending on the length of time control engineers expect an energy imbalance to persist for. Contracted units are allowed to submit different duration parameters as per the Grid Code. • Location Units will not be dispatched if doing so would exacerbate an existing network constraint. <p>It is also possible that Balancing Reserve contracted providers could be dispatched for system reasons rather than for energy balancing.</p> <p>Their overall decision will deliver the most economic and efficient outcome with the information available to them during real time operation.</p> <p>This finding supports a Pay-As-Bid utilisation price.</p> <p><u>Interaction with the conclusions of the Dec 2019 request</u></p> <p>The Dec 2019 request cited that “<i>the BM provides energy for both constraint/system management and for energy balancing purposes drawn from one merit order</i>”. This will remain true following the introduction of day ahead procurement of Balancing Reserve as contracted BR providers could be dispatched for energy reasons or to support constraints with actions flagged appropriately. It is unlikely that contracted BR providers would be sent a BOA for voltage or inertia reasons as contracted BR providers will typically be generating to be able to provide the BR service and therefore can provide voltage and inertia support with no additional energy instructions.</p> <p>The value of a combined merit order is that it delivers more options to the control room and therefore allows for lower total costs than a world where contracted BR providers were held purely for energy balancing and couldn’t be used to meet other needs. In practice, during periods of low demand, or during periods of high network congestion there may not be sufficient flexibility available on the system to facilitate the full sterilisation of balancing Reserve for energy only actions. Combined with this, part of the Balancing Reserve design is to be able to provide additional Mandatory Frequency Response in real time, which may require positioning instructions, which are not pure energy balancing.</p> <p>The Dec 2019 request states “<i>Forcing the ESO to take unique actions for system operator actions and energy balancing is neither efficient nor practical in operational terms.</i>” This statement remains true once BR has been introduced.</p> <p>Deriving a utilisation clearing price in real time that only applied for Balancing Reserve dispatch whilst retaining a combined merit order would either sterilise contracted BR provider capabilities, leaving the Control Room unable to use them to support other system needs or the BR utilisation clearing price would be polluted by actions taken for non-BR reasons. Adopting a Pay-As-Clear utilisation price for BR whilst the BM remains a combined merit order stack would mean consumers lose out on lower cost solutions and end up paying more.</p>
<p>Full Information</p>	<p><i>Full information is not available to support dispatch pricing decisions in real time.</i></p> <p>ESO’s daily reserve holding requirements (in MW) will be published ahead of the auction. The full auction results, which includes both accepted and rejected bids together with their volume and price, will be shared on the ESO Data Portal after assessment is completed.</p> <p>However, during real time operation utilisation pricing decisions cannot be informed by full information when a system disturbance happens (or actions are taken preventatively to manage an anticipated disturbance). Control room engineers continuously assess the</p>

	<p>volume needed and instruct the service manually (which means no clear utilisation requirements for BR can be defined and shared beforehand). This makes Pay-As-Clear utilisation pricing difficult to manage for market participants.</p> <p>Dispatch data will be available through the usual Elexon channels post event.</p> <p><u>Interaction with the conclusions of the Dec 2019 request</u></p> <p>The Dec 2019 request included a view on data relating to BM bids and offers and concluded that whilst data was fully available, the timing of data availability proves a problem in supporting real time Pay-As-Clear price discovery.</p> <p>The introduction of Balancing Reserve will provide no new data flows that can solve this problem and therefore this conclusion is still valid.</p> <p><i>“ ... there is significant data available to the market post-event – including the bid and offers provided, the bids and offers accepted, technical characteristics, and the price and volume paid. However, due to the real-time nature of the activities of the ESO, whilst these guide market parties in general trends, the specifics in a given settlement period cannot be fully known until real-time, in a timescale in which market parties cannot effectively respond.”</i></p>						
<p>Competition</p>	<p><i>The Balancing Reserve market is expected to be competitive. The level of competition could increase further once smaller providers are able to enter the market in the future.</i></p> <p>To assess the level of competition to be expected in the daily Balancing Reserve market we created three cases: Summer High Case, Summer Base Case and Max Participation. More details about the three cases can be found in the Appendix.</p> <p>1. HHI & Market Concentration</p> <p>The Herfindahl Hirschman Index (HHI) of market concentration was calculated for each of the three cases.</p> <table border="1" data-bbox="456 1294 1535 1361"> <thead> <tr> <th>Summer High Case</th> <th>Summer Base Case</th> <th>Max Participation</th> </tr> </thead> <tbody> <tr> <td>1104</td> <td>1099</td> <td>1251</td> </tr> </tbody> </table> <p>In all cases the HHI was below 1500. This indicates a competitive marketplace. The full breakdown of company market shares used to calculate the HHI values is below.</p>	Summer High Case	Summer Base Case	Max Participation	1104	1099	1251
Summer High Case	Summer Base Case	Max Participation					
1104	1099	1251					

	Summer High Case	Summer Base Case	Max Participation
Company	Market Share %	Market Share %	Market Share %
SSE	13.84	13.54	11.82
ESB	3.62	5.20	3.11
Uniper	11.76	6.88	20.80
Intergen	4.58	2.37	4.39
Drax	9.68	12.22	9.06
VPI	7.67	9.82	7.38
RWE	19.49	20.06	19.95
First Hydro	3.08	4.70	5.19
EP	9.42	7.51	5.89
Triton Power	8.49	6.63	5.07
Seabank Power	3.17	4.11	4.10
UK Transition Power	5.19	6.97	3.22

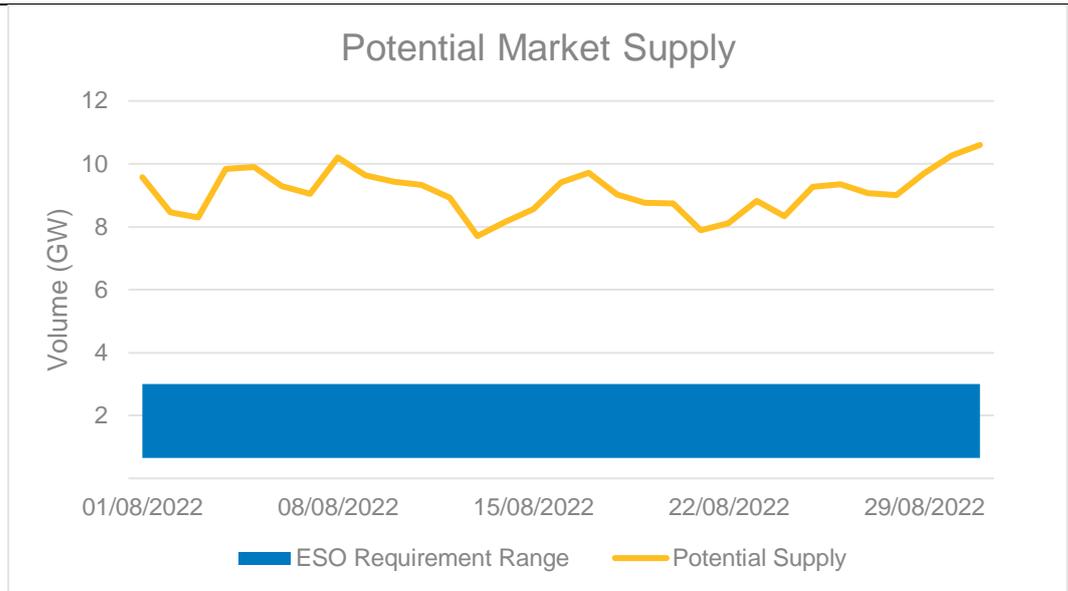
Average Market Shares in a 'Balancing Reserve' market

- SSE
- ESB
- Uniper
- Intergen
- Drax
- VPI
- RWE
- First Hydro
- EP
- Triton Power
- Seabank Power



2. Level of market supply

This chart shows that for the August example used, the headroom/footroom available from this eligible cohort does vary depending on weather conditions and plant availability. However, it is always comfortably above our maximum requirement.



Interaction with the conclusions of the Dec 2019 request

The Dec 2019 request calculated HHI using data from the 2018 calendar year. The above charts used a snapshot of data from August 2022 augmented with expected BR participants who might have been on outage or due to commission in the future.

It is likely that in the intervening time period some company ownership has changed which can have a significant impact on the resulting HHI number.

The Dec 2019 request reported a range of HHI values with a mean value of 2680. The methodology used in the analysis would be affected by plant outages in individual periods rather than taking a longer month view like this pricing proposal does for the Summer High and Base cases enclosed above.

This is likely to produce more uncompetitive periods and is based on accepted volumes rather than the volumes that were available which is not necessarily representative of the true size of the marketplace.

In conclusion, the differences in the HHI are due to differences in the methodology used and for the purposes of Balancing Reserve we expect competition between providers for both availability contracts and when it comes to utilisation in real time.

Implementation

To enable implementation, we need to be able to use a Pay-as-Bid payment mechanism for utilisation payments. We are able to implement Pay-as-Clear for availability payments through our new assessment tool development as this element of the service does not affect BM systems and data flows.

To fully benefit from the cost savings identified through procurement of Balancing Reserve in a firm capacity the market must be launched as soon as possible. This requires working with many of the existing systems and processes that we already have in place.

This constraint has influenced our design in several areas and also applies to the decision about the payment mechanism.

To be able to manually dispatch Balancing Reserve we need to use the existing BM Bid Offer Acceptance system which is Pay-as-Bid. It is not possible to change this system or to implement an alternative dispatching system in the time allowed.

	<p>The cost of implementing such a change to the BM or developing an alternative system and portal to facilitate the development of real time clearing prices would be significant.</p> <p>A comprehensive impact assessment of the costs and implications of moving BM energy dispatch to a Pay-As-Clear payment mechanism was produced by the ESO in May 2021.</p> <p>The purpose of the document was to describe and cost the impacts to the existing ESO balancing systems of implementing Article 6(4) of the CEP. The document analysed a set up very similar to the one that would be created by moving Balancing Reserve utilisation to Pay-As-Clear: a marginal price calculated for energy flagged actions with system flagged actions remaining Pay-As-Bid.</p> <p>The total implementation cost identified by this impact assessment was ~£60m (in 2021 prices).</p> <p>It would not be possible to optimise dispatch across pay-as-bid and pay-as-clear market structures and so this would also prevent economic and efficient dispatch.</p> <p><u>Interaction with the conclusions of the Dec 2019 request</u></p> <p>The Dec 2019 request touched on the implementation costs associated with introducing a Pay-As-Clear methodology providing a number of different categories where moving BM bid and offer payments to Pay-As-Clear would introduce additional cost and complexity.</p> <p>These categories included: code modifications, impacts to imbalance pricing and impact of BM parties to update their pricing strategies. There is no new information to suggest that these points are no longer relevant.</p>
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If Pay as Cleared is not the outcome, further detail is required.

Overall Assessment	Pay-as-bid
Description of measure proposed to minimise the use of the Specific product subject to economic efficiency	<p>The ESO does not have access to standard products at this time. This means that we are unable to use standard products to meet the need which the Balancing Reserve product fulfils. The recast Electricity Regulation states that the ESO may only use specific FCR products in an economically efficient manner, in line with our license obligations to manage the system safely and effectively. Our requirement setting and buy order methodology will minimise the use of this specific product and ensure that procurement is economic and efficient.</p>
A demonstration that the Specific balancing product does not create significant inefficiencies and distortions in the balancing market inside the scheduling area	<p>The introduction of Balancing Reserve procurement at day ahead of delivery serves will meet a need for access to flexibility that the ESO has previously met through instructions in the Balancing Mechanism. Moving BR procurement to day ahead of delivery will not introduce any new inefficiencies or distortions within the scheduling area.</p> <p>To utilise this Balancing Reserve service to full effect there is a need to align seamlessly with existing BM mechanics including dispatch mechanism.</p> <p>This means that BM bids and offers are the most appropriate mechanisms to dispatch and pay for Balancing Reserve in line with the existing routes to access Balancing Reserve in the BM. This provides certainty in revenue expectations for contracted BR providers that they can recover their marginal cost of utilisation and removes the risk of BR market participants baking their utilisation expectations into their availability submissions and distorting the pay-as-clear availability price signalling.</p> <p>Analysis commissioned from external consultants LCP forecast a consumer benefit over the next 3 years of between ~£100m and ~£1500m, with a central case of ~£900m. A key finding from the LCP work was that the value of expected BM revenue factored into wholesale market pricing strategies is likely to be lower as market expectations will adapt to fewer BM actions. This is due to market knowledge that ESO has secured a given volume of Balancing Reserve before the wholesale market runs. This could improve wholesale market operation as industry could plan better for their opportunity cost of not holding capacity for BM participation in real time and reduce distortions within the scheduling area.</p>
A demonstration that the Specific balancing product do not create significant inefficiencies and distortions in the balancing market outside the scheduling area	<p>ESO requirement and market results will be published so no inefficiencies and distortions in the balancing market outside the scheduling area are</p>

	<p>expected to be created by the introduction of this BR service.</p>
<p>Where applicable, the rules and information for the process for converting the balancing energy bids from Specific balancing product into balancing energy bids from standard balancing products. EU Regulation 2019/943</p>	<p>Not applicable to this Balancing Reserve service as there are no standard products currently in operation in GB.</p>

<p>Date of scheduled review</p>	<p>In accordance with the GB Pricing Proposal clause 3.8 a periodic review of the market for Balancing Reserve is scheduled for 3 years following the Go Live date of the service.</p> <p>Review date: 01 April 2026</p>
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Appendix: Defining the data set for competition analysis

Identifying eligible units

- Data for August 2022 (no wind, no nuclear, no interconnector, no demand BMUs).
- Pulled maximum MEL and average SEL value for each day.
- Identified difference between maximum daily MEL and average daily SEL for each daily pair.
- Selected maximum difference across the month.
- Removed all BMUs where maximum gap was <50MW, leaving 59 unique units.
- Included additional units who had 0MW MEL in August, adding 15 unique units, following manual checking.
- Searched company on BMRS, in TEC register, Google and CM register.

ESO balancing reserve requirement

Used a maximum winter requirement, regulating reserve for the run up to Darkness Peak, and a minimum winter requirement, regulating reserve for overnight 1a period.

This provided a range between 2.5GW and 400MW.

Cases

Summer High Participation Case

Some of our expected participants in the market will be unavailable to participate during the summer. This case includes a high participation summer case where all available units are online and enter the market.

Assumption	Points	Figure
Volume from participating units	<ul style="list-style-type: none"> • Data for August 2022 (no wind, no demand BMUs). • Pulled maximum MEL and average SEL value for each day. • Identified difference between maximum daily MEL and average daily SEL for each daily pair. • Selected maximum difference across the month. 	59 units 14.6 GW
Unavailable units	<ul style="list-style-type: none"> • Assumed volume from 14 units which did not submit MEL data in August 2022 were unavailable and did not participate. • Roosecote battery is assumed to be unable to deliver the service despite being large enough. 	15 units

Summer Base Participation Case

This case assumes that some of the units who are available have reduced MELs in line with the median MEL-SEL capacity.

Assumption	Points	Figure
Volume from participating units	<ul style="list-style-type: none"> • Data for August 2022 (no wind, no demand BMUs). • Pulled average MEL and average SEL value for each day. • Identified difference between mean average daily MEL and average daily SEL for each daily pair. • Selected median difference across the month. 	45 units 9.5GW
Unavailable units	<ul style="list-style-type: none"> • Assumed volume from 29 units which did not submit MEL data in August 2022 were unavailable and did not participate. • From median average headroom a further 14 units were no longer assumed to be participating. 	29 units

	<ul style="list-style-type: none"> Roosecote battery is assumed to be unable to deliver the service despite being large enough. 	
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Max Participation Case

This case assumes that all eligible units are fully available and choose to enter the market.

Assumption	Points	Figure
Volume from participating units	<ul style="list-style-type: none"> Data for full year. Headroom calculated as difference between capacity and SEL. 	74 units 17.3GW
Unavailable units	<ul style="list-style-type: none"> Roosecote battery is assumed to be unable to deliver the service despite being large enough as it doesn't have MFR capability. 	1 units