Economic Regulation Authority

Energy Offer Price Floor review 2025

Draft determination

5 March 2025

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Economic Regulation Authority

Level 4, Albert Facey House

469 Wellington Street, Perth WA 6000

Telephone 08 6557 7900

Email info@erawa.com.au

Website www.erawa.com.au

This document can also be made available in alternative formats on request.

National Relay Service TTY: 13 36 77

Invitation to make submissions

Submissions are due by 4:00 pm WST, Thursday, 3 April 2025

The ERA invites comment on this paper and encourages all interested parties to provide comment on the matters discussed in this paper and any other issues or concerns not already raised in this paper.

We would prefer to receive your comments via our online submission form https://www.erawa.com.au/consultation

You can also send comments through:

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Post: Level 4, Albert Facey House, 469 Wellington Street, Perth WA 6000

Please note that submissions provided electronically do not need to be provided separately in hard copy.

All submissions will be made available on our website unless arrangements are made in advance between the author and the ERA. This is because it is preferable that all submissions be publicly available to facilitate an informed and transparent consultative process. Parties wishing to submit confidential information are requested to contact us at info@erawa.com.au.

For further information please contact

General Enquiries

Jesse Barker
Ph: 08 6557 7900
info@erawa.com.au

Media Enquiries

Ph: +61 428 859 826
media@erawa.com.au

Contents

List of appendices

Executive summary

The Wholesale Electricity Markets (WEM) has undergone major reform in recent years, with a new market starting on 1 October 2023. In the new WEM, the Real-Time Market and the Short-Term Energy Market (STEM) share a ceiling price and floor price that restrict the range of bids that can be offered into each market. The ceiling price aims to prevent the abuse of market power by limiting the maximum offer price a facility can make.

The Energy Offer Price Floor is the lowest price that electricity can be offered into each market and aims to allow for generators to bid at negative prices that reflect the value they place on being dispatched.

Pre-reform, the Energy Offer Price Floor market function was called the Minimum STEM Price and was set at -$1,000 per Megawatt-hour (MWh). The ERA's two previous reviews of the Minimum STEM price concluded that this value was appropriate. When the new WEM commenced operation, the Energy Offer Price Floor carried over the -$1,000/MWh value.

The ERA's review includes assessing how often the Real-Time Market cleared at the Energy Offer Price Floor. Since 1 October 2023, the Real-Time Market has cleared at the Energy Offer Price Floor less than 1 per cent of the time (44 30-minute intervals out of 23,424 total intervals).

The 44 intervals where the market did clear at the price floor all occurred under low demand conditions. The days when these intervals occurred were mild temperature, non-cloudy days which favour the production of rooftop solar electricity and does not generally see high demand for household heating or cooling. The effect is a significant reduction in daytime demand for grid supplied electricity, particularly between 10:00am and 2:00pm, which puts downwards pressure on the price of wholesale electricity that can lead to the market clearing at the floor price.

A key characteristic of the new WEM is co-optimisation of the Real-Time Market with essential system service markets, that are needed to ensure the safe and reliable production of electricity. The Real-Time Market will clear at the Energy Offer Price Floor when the quantity of electricity bid at the floor is equal to or greater than total demand, less electricity generated from the procurement of essential system services. The same conditions that cause low demand in the Real-Time Market can also create high essential system service requirements. This occurrence contributed to some of the intervals clearing at the floor price during this review period.

Rule changes that came into effect on 20 November 2024 have lessened the amount of electricity generation needed in the procurement of those essential system services and will likely result in the Real-Time Market clearing at the floor less often.

To make this draft determination, the ERA has balanced its assessment of the historical instances of Energy Offer Price Floor dispatch intervals with a future-focused assessment of the South West Interconnected System's (SWIS) generation fleet and considered how the results align with the overarching principles set out in the Electricity System and Market Rules (previously called the WEM Rules).

The ERA's draft determination is that the Energy Offer Price Floor remains appropriate and does not need to change. Based on the assessment criteria in the market rules, although the market has had one or more dispatch intervals settle at -$1,000/MWh, the instances were not related to the floor price's value being too high. Coupled with little change in the composition of the WEM's generation fleet during the review period, there is no case for changing the floor price. It is unlikely that a change to the Energy Offer Price Floor will be needed until the existing

high cycling generators experience significant upgrades or deterioration that materially alters their cycling costs, or for all of these generators to retire from the WEM.

1. Introduction

This report contains the ERA's draft determination on whether the current Energy Offer Price Floor value of -$1,000 per MWh is appropriate. Although this is the ERA's first review of the Energy Offer Price Floor, it is essentially a continuation of the ERA's previous reviews of the Minimum STEM Price in the pre-1 October 2023 WEM. The Energy Offer Price Floor inherited the same value as the Minimum STEM Price when the new WEM market commenced.

The Energy Offer Price Floor is designed to allow for generators to bid at negative prices that reflect the value they place on being dispatched. Effectively, bidding at the floor price reflects that a generator would be willing to pay to continue generating, provided the expected payment is less than the cost to shut down and restart, subject to any technical limitations such as minimum down times.[1]

The price floor supports an efficient market by allowing facilities to price themselves low enough to reflect their willingness to pay to be dispatched before other generators. For example, facilities with large shut down and start-up costs may want to be dispatched and kept running to avoid incurring these costs.

1.1 Changes from the pre-reform to post-reform market

The new WEM commenced on 1 October 2023. The WEM reforms were implemented to address a range of issues arising from the energy transformation in the SWIS. Pre-reform, the balancing market was a simplified gross pool dispatch, but now the Real-Time Market is a co-optimised dispatch mechanism designed to obtain the lowest overall cost for consumers.

In the post-reform market, the system is designed to co-optimise across the Real-Time Market and essential system services, called Frequency Co-optimised Essential System Services (FCESS) markets to find the lowest cost for consumers whilst maintaining system security. FCESS services support the safe and secure operation of the power system and are procured through the Real-Time Market.[2] The dispatch algorithm is designed to find the combination of prices across all markets to supply energy and FCESS across the network at the least cost, while still respecting network losses and constraints.[3]

1.2 Impact of the entry of batteries since the 2022 Minimum STEM Price review

In the 2022 Minimum STEM Price review, the ERA expected that the introduction of large battery storage to the WEM over the following years would reduce instances of the market clearing at the Minimum STEM Price.[4] The ERA expected that the effect of high rooftop solar output on reducing demand in the middle of the day would be more than offset by increased demand from batteries charging during these periods when electricity prices are typically at their lowest.

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1 The minimum level of generation is the minimum amount of electricity a generator must generate for stable operations. The minimum down time is the amount of time that a generator must remain offline between shutdowns and restarts.

2 AEMO. 2023. *Wholesale Electricity Market Design Summary*. p.50 (online).

3 AEMO. 2023. *Wholesale Electricity Market Design Summary*. p.85 (online).

4 Economic Regulation Authority, 2022, *Minimum STEM price review 2022 – Final determination report*, p. 17 (online).

However, the entry of battery capacity has been slower than expected, while solar penetration has continued at pace, resulting in ongoing decreases to minimum demand forecasts. The Australian Energy Market Operator's (AEMO) most recent Electricity Statement of Opportunities report shows that minimum demand is forecast to decline across the 10-year outlook period and that solar will continue to create minimum demand issues during the middle of the day when their output is at peak.[5]

In the future batteries may have a greater offsetting impact on the frequency of Energy Offer Price Floor intervals.

1.3 Energy Offer Price Floor review principles

The ERA's Energy Offer Price Floor review must apply the following principles:

> 2.26.2D. In conducting a review required by clause 2.26.2C, the Economic Regulation Authority must apply the following principles:
>
> (a) the Economic Regulation Authority must only revise the value of the Energy Offer Price Floor if it determines that the current value of the Energy Offer Price Floor is not appropriate under clause 2.26.2E;
>
> (b) if the Economic Regulation Authority determines that the current Energy Offer Price Floor is not appropriate under clause 2.26.2E, the revised value for the Energy Offer Price Floor must:
>
> i. allow for the Real-Time Market for energy to clear without the Reference Trading Price being equal to the Energy Offer Price Floor in most circumstances; and
>
> ii. subject to clause 2.26.2D(b)(i), limit the exposure of Market Participants to Reference Trading Prices that are reasonably likely to materially adversely affect the financial viability of a prudent Market Participant.

The assessment period for this review is from 1 February 2022 to 31 January 2025.

When making its determination under clause 2.26.2D(a) on whether the current Energy Offer Price Floor is appropriate, the ERA must consider the criteria set out in clause 2.26.2E. This requires the ERA to consider:

- If the Real-Time Market has cleared at the Energy Offer Price Floor in one or more Dispatch Intervals due to the floor price being too high.
- If there has been any change in the generation fleet that is likely to result in the Energy Offer Price Floor value being materially too low or too high.

In the event that the ERA determines that the Energy Offer Price Floor is not appropriate, then a second step is triggered requiring the ERA to determine a new Energy Offer Price Floor based on the method in the Electricity System and Market Rules (market rules). As the ERA's draft determination is that the Energy Offer Price Floor value remains appropriate, there is no need to proceed with the second step of determining a new price.

[5] AEMO, 2024, *2024 Wholesale Electricity Market Electricity Statement of Opportunities.*, p.43 (online).

The ERA's draft determination is outlined in Chapter 2 and stakeholders are invited to provide submissions on the ERA's draft determination by 3 April 2025.[6] The ERA will prepare and publish its final determination by 1 June 2025.[7]

[6] Wholesale Electricity Market Rules (WA), 1 February 2025, rule 2.26.2L(b) (online).

[7] Wholesale Electricity Market Rules (WA), 1 February 2025, rule 1.61.4 (online).

2. ERA's draft determination

The ERA's draft determination is that the Energy Offer Price Floor is appropriate at its current value of -$1,000/MWh. The ERA's analysis of the review criteria under the market rules, including the objectives of the Energy Offer Price Floor, do not indicate that the Energy Offer Price Floor is too high or too low.

The ERA has applied the principles set out in clause 2.26.2D and the criteria in clause 2.26.2E of the market rules in making this draft determination.

The ERA's analysis of the criteria in clause 2.26.2E shows that:

- From 1 October 2023, the market cleared at the Energy Offer Price Floor in 0.44 per cent of five-minute dispatch intervals (614 times). While the Real-Time Market has cleared at the floor more often than the last review, the market has cleared above the Energy Offer Price Floor in more than 99.56 per cent of dispatch intervals.

- There has not been a significant change in the generation fleet, nor has there been a material change in relevant generators' cycling costs over the review period that would lead to the current Energy Offer Price Floor value being too high or too low.

The ERA's draft determination is that the current Energy Offer Price Floor allows the Real-Time Market to clear above it in most circumstances. Additionally, the ERA has not been provided any evidence to date that shows how the current Energy Offer Price Floor will result in market participants being exposed to prices that will materially threaten their financial viability or the efficient operation of the market.

Stakeholders are invited to provide submissions on this draft determination by 3 April 2025.[8] The ERA will then consider all stakeholder submissions before it prepares and publishes its final determination.

[8] Wholesale Electricity Market Rules (WA), 1 February 2025, rule 2.26.2L(b) (online).

3. Criterion 1 – Dispatch intervals where the Real Time Market cleared at the Energy Offer Price Floor

Criterion 1 requires assessing whether:

> (a) the Real-Time Market for energy has cleared at the Energy Offer Price Floor in one or more Dispatch Intervals due to, in the Economic Regulation Authority's reasonable opinion, the Energy Offer Price Floor being too high.[9]

The review period, spanning from 1 February 2022 to 31 January 2025, covers both the old Balancing Market, and the new WEM. Due to the changes in the duration of the dispatch intervals from 30 minutes in the Balancing Market to five minutes in the new WEM, data has been transformed to ensure comparability across the review period. The ERA's assessment of Criterion 1, including these methodological changes, is detailed in this chapter.

3.1 Dispatch intervals clearing at the Energy Offer Price Floor

Between the start of the new market on 1 October 2023 to 31 January 2025, the Real-Time Market cleared at the Energy Offer Price Floor 614 times from a total of 140,544 five-minute dispatch intervals. This represents 0.44 per cent of dispatch intervals for the period.[10] That is, the Real-Time Market cleared 99.56 per cent of dispatch intervals above the Energy Offer Price Floor.

When compared to the previous Balancing Market, which had 30-minute trading intervals, this equates to 44 of the 23,424 30-minute trading intervals, or 0.19 per cent of the review period in the new WEM. While this reflects an increase from the prior review period, 0.19 per cent of trading intervals clearing at the Energy Offer Price Floor still represents a very small proportion, demonstrating the rarity of this occurrence.[11]

There has been an increase in instances of the Real-Time Market clearing at the floor price compared to the previous Balancing Market. Of the 44 trading intervals that cleared at the Energy Offer Price Floor between 1 October 2023 to 31 January 2025, 75 per cent (33 intervals) occurred on weekends when demand is expected to be low (Table 2). Most floor price trading intervals occurred during shoulder months, which is when demand is expected to be low and on days with optimal conditions for solar generation (see Appendix 2). Low demand can lead to the market settling at the Energy Offer Price Floor because the total amount of electricity priced at -$1,000/MWh can meet the total demand.

Additionally, all floor price trading intervals that cleared at the floor were recorded between 10:00am and 1:00pm, with 95 per cent of dispatch intervals at -$1,000/MWh recorded between 10:00am and 2:00pm when solar generation is expected to be at its highest. Strong home rooftop solar generation contributes to lowering demand for electricity from the grid, which in turn creates the conditions when floor prices are most likely to occur.

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9 Wholesale Electricity Market Rules (WA), 1 February 2025, rule 2.26.2E(a) (online).

10 A Dispatch Interval means each 5 minute period commencing at 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 and 55 minutes past the hour - Wholesale Electricity Market Rules (WA), 1 February 2025, Glossary, p.746. (online).

11 A Trading Interval means a period of 30 minutes commencing on the hour or half-hour during a Trading Day - Wholesale Electricity Market Rules (WA), 1 February 2025, Glossary, p.793. (online).

Table 1: Percentage of trading intervals that cleared at the Energy Offer Price Floor and days of the week they occurred (1 October 2023 to 31 January 2025)

Day	Total trading intervals that cleared at -$1,000/MWh	Percentage of trading intervals that cleared at -$1,000/MWh (%)
Monday	0	0
Tuesday	3	7
Wednesday	0	0
Thursday	8	18
Friday	0	0
Saturday	10	23
Sunday	23	52
Total	**44**	**100**

Source: *ERA analysis of market data*

Continued growth of rooftop solar has contributed to the rapid decline in minimum operational demand. A new record low of 511 MW was recorded in November 2024, and AEMO now estimate new minimum demand scenarios declining towards 0 MW in 2028/29.[12]

The ERA has identified a relationship in the new WEM between the conditions that favour the Real-Time Market clearing at the floor and how electricity is dispatched to meet FCESS requirements, this is discussed below.

3.2 Relationship between co-optimisation and floor price intervals prior to November 2024 rule changes

In the post-reform market, the same mild weather conditions that create low demand scenarios in the Real-Time Market are also likely to create high demand for FCESS, which are necessary to ensure system security, and which can influence the trading interval price. For example, high solar generation leads to greater demand in FCESS markets as solar is an intermittent technology that requires greater contingencies be in place in case generation is rapidly and suddenly disrupted.

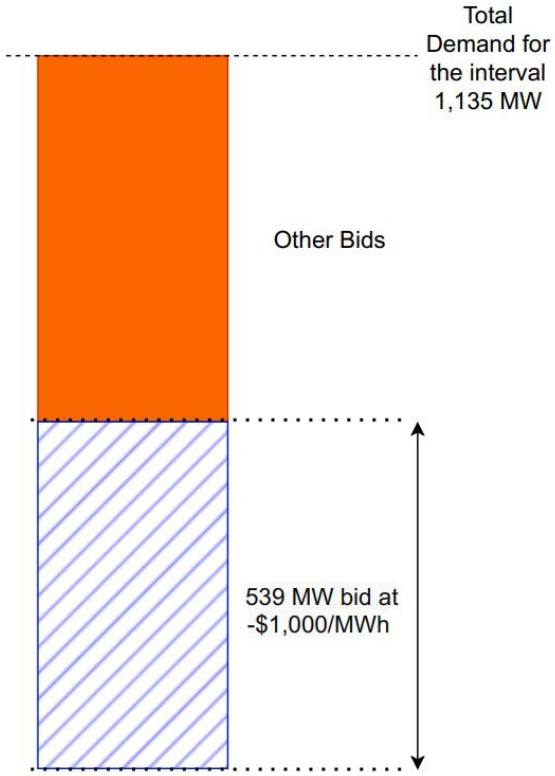
This process can be illustrated using an actual trading interval from 15 June 2024 when energy demand in the Real-Time Market was 1,135 MW, with 539 MWs bid at -$1,000/MWh. If dispatch considered only the energy market in its optimisation, the market would clear at the point where all 1,135 MW was met, using only the cheapest bid electricity in the merit order (see Figure 1).

In this example, the 1,135 MW of electricity demand was met by around 760 MW of electricity that was generated to meet FCESS requirements (see Figure 2), leaving only 369 MW to be

[12] AEMO, 2024, *2024 Wholesale Electricity Market Electricity Statement of Opportunities,* p.44 (online).

met through the normal merit order market mechanism.[13] As a result, the Real-Time Market cleared at the floor (see Figure 3).

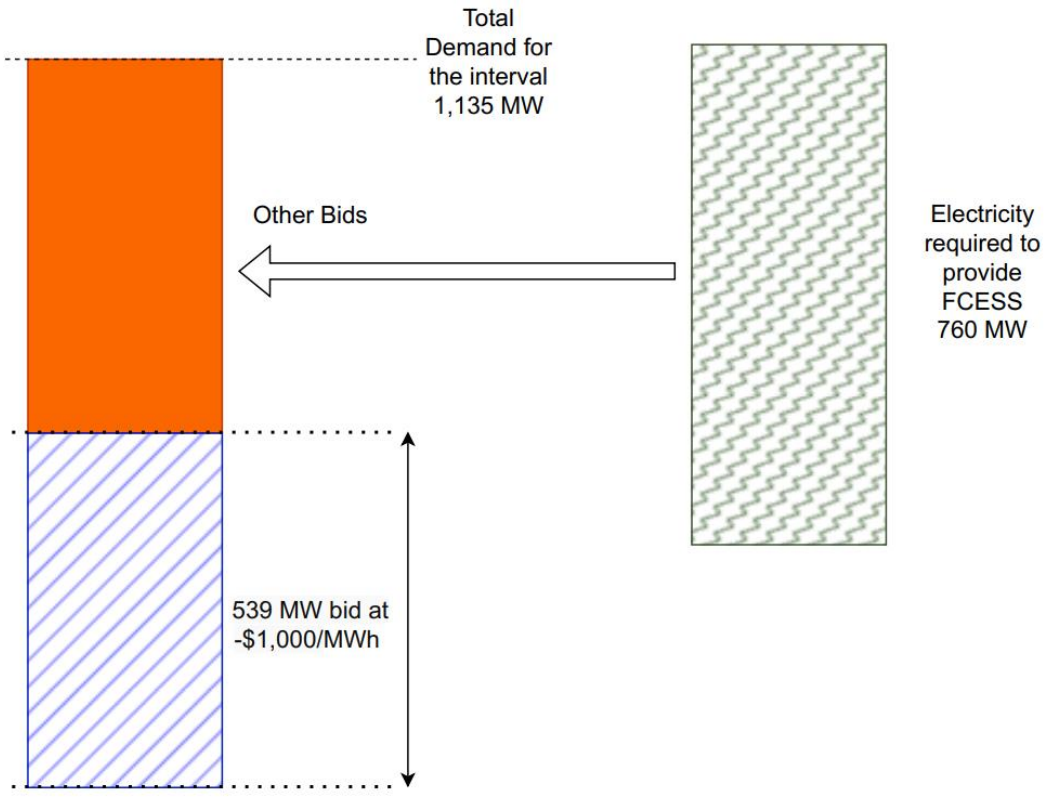
Figure 1: 11:30 am, 15 June 2024 trading interval – demand and electricity bid at the floor price



Source: ERA analysis of market data

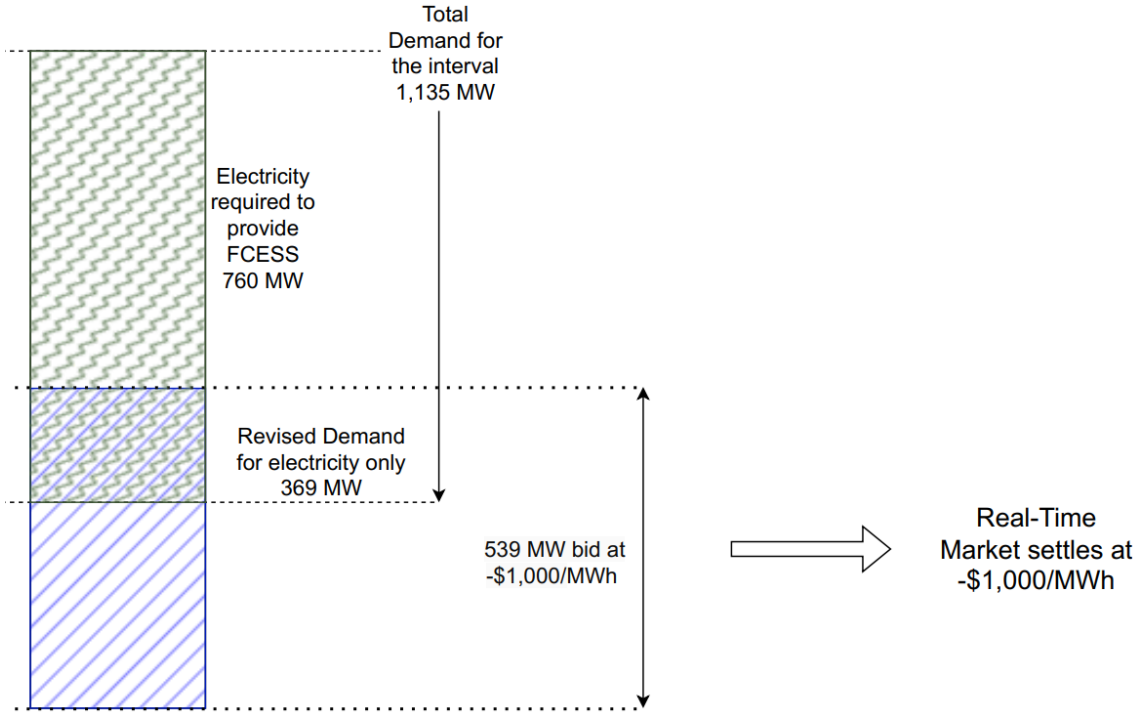
[13] The sum total of 790 MW and 369 MW is 6 MW less than 1,135 MW. This 6 MW amount related to network constraints and for the clarity of this example was excluded from the figures as it is immaterial.

Figure 2: 11:30 am, 15 June 2024 trading interval – electricity required to provide FCESS



Source: ERA analysis of market data

Figure 3: 11:30 am, 15 June 2024 trading interval – revised demand and Real Time Market price outcome

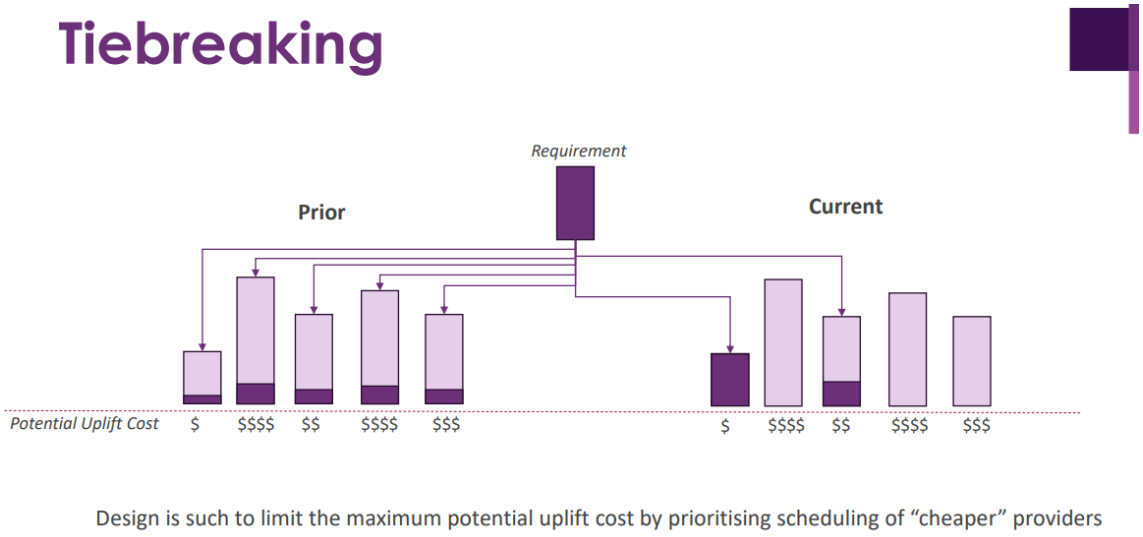


Source: ERA analysis of market data

This example is indicative of how dispatch worked for most of the review period in the post-reform market, where to meet FCESS requirements many generators accredited to provide FCESS bid at the same price, and all had to be dispatched due to the lack of a tiebreak method at the time. When this happened, each generator was brought in for the combined amount of their FCESS requirement and their minimum generation, resulting in a higher total electricity generated to meet FCESS requirements.

Rule amendments that came into effect on 20 November 2024 introduced tiebreak methods for how the dispatch process procures FCESS.[14] The intent of the rule amendment was to reduce the number of generators dispatched and prioritise dispatch of those with lower FCESS costs (see Figure 4). This amendment means that, if a similar scenario occurs to the example above, fewer generators would be brought in to meet the electricity required to provide FCESS. In effect this would reduce the amount of electricity that needs to be provided to service demand from FCESS which means that less will be displaced from the normal merit order mechanism.

Figure 4: Changes to FCESS tiebreaking methods from 20 November 2024 market rule changes



Source: AEMO. 3 December 2024. Real-Time Market Insights Forum. (online)

The new dispatch process means Real-Time Market demand would not be displaced to the same extent as in the example above and the market is now less likely to clear at the floor price. No dispatch or trading intervals have cleared at the floor from 12 November 2024 until the end of this review period. It is unlikely the scenario in the example above will occur again until after the peak summer period of 2025. The ERA expects that instances of the Real-Time Market clearing at the floor price are likely to decrease in the future.

Importantly, this identifies that the increased frequency of floor price intervals during this review period was not a result of the Energy Offer Price Floor value being set too high or low. Rather, it was because there was no mechanism for AEMO to differentiate between FCESS offers that bid at the same price at that time.

[14] Energy Policy WA. 2024. *Exposure Draft of WEM Amending Rules (FCESS Cost Review Amendments)*. p.1 (online).

3.3 Review period prior to new market start

For completeness, we also assessed the segment of the review period that occurred in the pre-reform market. From 1 February 2022 to 30 September 2023, only three intervals cleared at the -$1,000/MWh price floor. These results are consistent with previous reviews of the Minimum STEM price. Additional details regarding these intervals are included in Appendix 4.

3.4 Conclusion

This criterion requires the ERA to consider if one or more dispatch intervals cleared above the floor price due to the Energy Offer Price Floor being set too high.

From 1 October 2023 the market cleared at the Energy Offer Floor Price in 614 dispatch intervals and 44 trading intervals. In part, the increase may be attributed to the changes of the post-reform market. As five-minute dispatch intervals were only introduced from 1 October 2023, there is no historic comparative data to assess these against.

The increase in percentage of trading intervals clearing at the floor price, 0.19 per cent compared to 0.01 per cent in the previous review, indicates that there has been an increase across the review periods. This is likely the result of a faster increase in solar generation in the SWIS, leading to a sharper reduction in system low demand than anticipated in 2022 and the dispatch process for FCESS prior to the 20 November 2024 rule change.

The continual decline in minimum operational demand reflects progressively lower average demand in the middle of the day, which is likely resulting in the increased frequency of intervals clearing at the floor compared to the level we anticipated in our 2022 review. The entrance of battery storage has not reduced the frequency of floor price intervals as much as anticipated. However, batteries may have helped to offset the increase from being even larger.

At this point, the ERA considers the increase in frequency of intervals clearing at the floor price is not a reflection of the floor price being too high. Despite the increase, the Real-Time Market is still clearing above the Energy Offer Floor Price almost all of the time. This is in line with the overarching principle in the market rules that the value needs to allow for the Real-Time Market to clear above the Energy Offer Price Floor in most circumstances.

4. Criterion 2 – Changes in the SWIS's generation fleet

The ERA must assess changes in the generation fleet and determine if the current Energy Offer Price Floor is too high or too low to allow the RTM to clear above the Energy Offer Price Floor in most circumstances. The scope of the assessment for this criterion includes:

> (b) there has been a change in the generation fleet in the SWIS that, in the Economic Regulation Authority's reasonable opinion, is likely to result in:
>
> iii. the current Energy Offer Price Floor being materially lower than necessary to achieve the criterion in clause 2.26.2D(b)(i), including, but not limited to, an upgrade or the retirement of a Facility with high cycling costs; or
>
> iv. the current Energy Offer Price Floor being too high to achieve the criterion in clause 2.26.2D(b)(i), including, but not limited to, the increase of cycling costs due to deterioration or ageing of a Facility.[15]

4.1 Generator fleet changes

4.1.1 New facilities

The following facilities joined the WEM during the review period:

- Collie_ESR1 (200 MW) (Battery)
- Flatrocks_WF1 (75 MW) (Windfarm)
- Kwinana_ESR1 (100 MW) (Battery)
- Kwinana_ESR2 (225 MW) (Battery)
- SBSolar1_Cunderdin_PV1 (128 MW Solar with 55 MW Battery).

None of these new facilities offer electricity at the Energy Offer Price Floor, neither do they have an incentive to do so. For example, batteries will prefer to charge the more negative the electricity price. Additionally, renewable generation rebates are well above the Energy Offer Price Floor value, meaning those facilities would be incurring significant costs if they bid at the floor price. Consequently, this cohort of new facilities are unlikely to influence those generators willing to offer at the Energy Offer Price Floor, nor has the ERA received any evidence showing a change in those facilities willing to bid at the floor.

4.1.2 Decommissioned and unavailable facilities

Over the review period, the following facilities have been decommissioned or are expected to be decommissioned:[16]

- Kalamunda_SG (1.3 MW)
- Muja_G5 (195 MW)

[15] Wholesale Electricity Market Rules (WA), 1 February 2025, rule 2.26.2E(b) (online).

[16] The size of each plant is based on their capacity credits prior to being decommissioned.

- Muja_G6 (193 MW) – Muja_G6 has been operating in reserve outage mode since 1 October 2024 and is expected to be decommissioned in April 2025.

The East Rockingham waste to energy power plant (25 MW) was expected to provide capacity however the facility is in insolvency proceedings making the future ability of this facility to provide capacity uncertain.[17]

4.1.3 Upgrades and retirements of high cycling cost generators

The retirement of Muja G5 and the upcoming Muja G6 retirement remove two of the high cycling cost generators from the SWIS. These retirements have not affected the willingness of other high cycling cost generators to bid at the Energy Offer Price Floor value of -$1,000/MWh as those generators' cycling costs have not changed significantly. As their cycling costs have not changed much (a slight increase – see section 4.1.4), the willingness of these generators to bid at the floor remains unchanged.

4.1.4 Increases in generator cycling costs

A generator's cycling costs includes the costs the market participant incurs to shut down and restart a generator and the forgone revenue from offering electricity if it had not shut down. These costs are derived from considering:

- The cost of fuel, variable operating costs, and maintenance costs.
- The time the generator takes to shut down, the time it must remain out of service before it can restart and the time it takes for the generator to ramp back up to its minimum stable generating level.
- The opportunity costs that a generator would incur during these shutdown, minimum downtime and restart times (for example, unearned revenue due to the generator being shut down) and any associated cost savings.

A generator's cycling costs will influence a market participant's bidding behaviour, that includes the amount of electricity that it is willing to offer at the Energy Offer Price Floor value of -$1,000/MWh. Generators may price some of their electricity at the floor even when forecast prices are low as the costs of shutting down and cycling the generator can be substantially more than the loss from generating electricity at negative prices.

If generators with high cycling costs experience material changes to their cycling costs, then this could indicate that the current Energy Offer Price Floor may no longer be appropriate. For example, if a generator is upgraded which reduces the cost and/or time that it takes to shut down and restart, then during low-demand trading intervals, the generator may be willing to offer electricity at a higher price than the current Energy Offer Price Floor or be more willing to decommit to reduce its financial risk. If this happens to generators with high cycling costs that offer at the Energy Offer Price Floor, the Energy Offer Price Floor value may be unnecessarily low.

Conversely, if cycling costs for relevant generators have increased (for example, due to an increase in restart and shutdown costs), then the current Energy Offer Price Floor may be set too high, as generators cannot bid low enough to demonstrate how willing they are to not shut down. An indication of this is if the market settles at the Energy Offer Price Floor more often.

[17] Vieira I., 29 October 2024, ' Rockingham waste-to-energy plant in administration', *BusinessNews*, (online) [accessed 7 February 2025].

The ERA's method for assessing this criterion is to consider whether there have been material changes to generator cycling costs – that is, shutdown and restart costs and the associated shutdown, offline and restart times – during the review period. The ERA examined the relevant generators (those with high cycling costs) that typically bid some of their electricity at the Energy Offer Price Floor over the review period and if there had been changes to those facility's cycling costs. The ERA also considered new generators that were added to the SWIS during the review period and whether these new generators had high cycling costs that were relevant to the assessment of this criterion. Similarly, the ERA considered the retirement of high cycling cost generators and the remaining facilities that are willing to bid at the -$1,000/MWh Energy Offer Price Floor.

The ERA reviewed information from generators with high cycling costs, which showed that their cycling costs had slightly increased over the review period. The ERA observed that these generators were still offering quantities at -$1,000/MWh, indicating the cost increases were not material enough to change their willingness to bid at the floor price. Consequently, we concluded that there has not been a material change in generators' cycling costs that would indicate that the Energy Offer Price Floor is set too high or too low.

4.2 Conclusion

This criterion requires the ERA to assess changes in the generation fleet and determine whether the current Energy Offer Price Floor is too high or too low.

Given that there were no material changes in the relevant generators' cycling costs over the review period and there has not been a significant change in the generators that continue to bid at the current Energy Offer Price Floor, there are no compelling reasons that indicate that the -$1,000/MWh value is too high or too low.

Appendix 1 List of Tables

Appendix 2 List of Figures

Appendix 3 Demand period and weather conditions during Energy Offer Price Floor trading intervals

As discussed earlier in this report, the increased frequency of 30-minute trading intervals that cleared at the Energy Offer Price Floor were likely more impacted by the market dynamics and weather conditions on the day than being an indicator of the floor value being set too high. The below table sets out the relevant day, demand period (as determined by AEMO) and weather conditions of each day a trading interval cleared at the -$1,000/MWh Energy Offer Price Floor.

All 44 intervals occurred between 10:00am and 1:30pm.

This reflects that most trading intervals that cleared at the Energy Offer Price Floor occurred on days or during periods of known lower operational demand, and when conditions for solar generation were favourable. Together these characteristics make it more likely for the Real-Time Market to clear at the floor price.

Table 2: Dates with trading intervals that cleared at the Energy Offer Price Floor (1 October 2023 to 31 January 2025)

Days with Energy Offer Price Floor trading intervals	Total trading intervals that cleared at -$1,000/MWh	Demand period[18]	Daily Maximum Temperature (C)[19]	Rain (mm)[20]
Sunday, 4 February 2024	1	Operational Maximum (Peak)	25.5	0.2
Saturday, 1 June 2024	4	Operational Minimum	25.8	0
Saturday, 15 June 2024	4	Operational Minimum	22.7	0
Sunday, 30 June 2024	2	Operational Minimum	19.3	0
Saturday, 27 July 2024	1	Operational Minimum	20.4	2.4
Thursday, 12 September 2024	1	Shoulder month	26.9	0
Sunday, 22 September 2024	3	Shoulder month	24.6	0
Sunday, 6 October 2024	2	Shoulder month	23.5	0
Tuesday, 8 October 2024	1	Shoulder month	21.8	0
Thursday, 10 October 2024	4	Shoulder month	28.0	0
Sunday, 13 October 2024	8	Shoulder month	25.4	0
Saturday, 26 October 2024	1	Shoulder month	22.5	0
Sunday, 3 November 2024	7	Shoulder month	22.4	0.8
Thursday, 7 November 2024	3	Shoulder month	21.6	0.2

[18] Based on operational maximum (peak) and minimum demand definitions as outlined in AEMO, 2024, *2024 Wholesale Electricity Market Electricity Statement of Opportunities,* p.99 (online).

[19] Bureau of Meteorology, 'Daily Weather Observations', (online) [accessed 11 February 2025].

[20] Ibid.

Days with Energy Offer Price Floor trading intervals	Total trading intervals that cleared at -$1,000/MWh	Demand period[18]	Daily Maximum Temperature (C)[19]	Rain (mm)[20]
Tuesday, 12 November 2024	2	Shoulder month	24.1	0
Total trading intervals	**44**			

Source: ERA analysis of market data and Bureau of Meteorology data.

Appendix 4 Pre-reform trading intervals that cleared at the Energy Offer Price Floor

The review period for this initial Energy Offer Price Floor Review extends from the last Minimum STEM Price review on 1 February 2022 to 31 January 2025. This means data spans across the pre- and post-reform market. While most of the analysis in this determination is focused on the post-reform market, for completeness the ERA has also considered any trading intervals that cleared at the Energy Offer Price Floor up to the end of the pre-reform market.

Analysis of the period from 1 February 2022 to 30 September 2023 identified three 30-minute trading intervals that cleared at the floor price of -$1,000/MWh.

Table 3: Trading intervals that cleared at the Energy Offer Price Floor (1 February 2022 to 30 September 2023)

Date	Interval	Demand (MW)	Reference Trading Price ($/MWh)	Daily Maximum Temperature (C)[21]	Rain (mm)[22]
Sunday, 16 October 2022	12:00	605	-1,000	21	0
Thursday, 20 April 2023	12:30	1,012	-1,000	25.5	0
Monday, 25 September 2023	12:00	581	-1,000	21	0

Source: ERA analysis of market data and Bureau of Meteorology data.

21 Bureau of Meteorology, 'Daily Weather Observations', (online) [accessed 11 February 2025].

22 Ibid.