



Economic Regulation Authority

Procedure Change Proposal: Benchmark Reserve Capacity Price

[EEPC_2025_01]

13 November 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.

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Invitation to make submissions

Submissions are due by 4:00pm WST, Thursday, 11 December 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:

Email: publicsubmissions@erawa.com.au

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

Keira Robinson
Ph: 08 6557 7959
info@erawa.com.au

Media Enquiries

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

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Executive summary

In Western Australia's Wholesale Electricity Market (WEM), the Reserve Capacity Mechanism is used to signal opportunities for investment in capacity to meet system reliability requirements. The Benchmark Reserve Capacity Prices (BRCPs) are used, along with the level of excess capacity in the WEM and reserve capacity requirements, to determine reserve capacity prices.

The BRCPs must reflect the fixed costs of developing and operating a hypothetical Benchmark Capacity Provider. The Flexible BRCP and Peak BRCP comprise annualised capital costs and annual fixed operating and maintenance (O&M) costs, expressed per unit of Flexible Capacity Credit and Peak Capacity Credit that is expected to be assigned to the capacity provider.¹

In October 2025, the Coordinator of Energy determined both the Flexible and Peak Benchmark Capacity Providers are lithium Battery Energy Storage System (BESS) with 200-megawatt (MW) injection and 1,200-megawatt hour (MWh) storage capacity (i.e. 6-hour BESS) connected at a 330-kilovolt (kV) transmission line on the Clean Energy Link – North.^{2,3}

The ERA must review the WEM Procedure outlining the method to determine the BRCP to reflect the Coordinator's changes to the Benchmark Capacity Providers. Any amendments to the WEM Procedure must be consistent with the State Electricity Objective, ESM Rules, the *Electricity Industry Act 2004* and *Electricity Industry (Wholesale Electricity Market Regulations) 2004*.⁴ Prior to amending a WEM Procedure, the ERA must publish a procedure change proposal for stakeholder feedback.⁵

The ERA must determine the BRCPs prior to 16 March 2026 for the 2026 Reserve Capacity Cycle.⁶ As a result, the ERA must review the WEM Procedure so it can be applied to the ERA's 2026 BRCPs determination.⁷

Call for submissions

This procedure change proposal outlines the ERA's reasons for amending the WEM Procedure to reflect the Coordinator's change to the Benchmark Capacity Providers. We invite stakeholder feedback on the proposed changes.

The ERA sought advice from GHD, Landgate and Western Power to develop this procedure change proposal and identify the material differences in cost components and estimation method between a 4-hour BESS and 6-hour BESS. GHD's report is provided in Appendix 4.

¹ A capacity credit is a notional unit equivalent to 1 megawatt (MW) of capacity provided by a facility during a capacity year that reflects the contribution of facility to meeting the reliability standard of the system. Capacity suppliers receive payments consistent with the number of capacity credits they hold, and in return, commit to providing their capacity to AEMO in a capacity year. The capacity payments provide incentives for investment when the system requires new capacity.

² The Coordinator of Energy issued its determination on 30 September 2025, followed by an addendum on 9 October 2025. See: Energy Policy WA, 2025, *Review of the Benchmark Capacity Providers: Coordinator of Energy Determination* ([online](#)); Energy Policy WA, 9 October 2025, *2025 Review of Benchmark Capacity Providers: Coordinator of Energy Determination, Addendum*, ([online](#)).

³ Previously, both Peak and Flexible Benchmark Capacity Providers were a 200 MW / 800 MWh (i.e. 4-hour) lithium BESS connected at a 330 kV line near Kwinana or Pinjar.

⁴ Electricity System and Market Rules (WA), 30 October 2025, Rule 2.9.3(a) ([online](#)).

⁵ Ibid, Rule 2.10.7.

⁶ Ibid, Rule 1.68.1.

⁷ Ibid, Rule 1.68.2.

We propose to retain the following aspects of the existing Procedure:

- Lithium iron phosphate as the BESS sub-chemistry, given it remains the benchmark for reliability and market acceptance for BESS in Australia.
- Capital cost and fixed O&M cost components, as these cost drivers are typical of BESS facilities.
- Annualisation period of 15 years, as the approach to plant life and operational assumptions remain unchanged and aligns with investors' expectations and typical project financing periods.
- Rate of return: a nominal pre-tax weighted average cost of capital (WACC), with annual parameters being reviewed and fixed parameters remaining the same.
- An annuity tilt of 1.0 to provide certainty to investors and mitigate the variability of yearly changes in cost.

The material changes proposed to the WEM Procedure are:

- Design specifications of the BESS as required by the Coordinator's determination (i.e. 1,200 MWh storage capacity).
- Greater land size of 7.3 hectares to accommodate the larger facility.
- Change in the location as required by the Coordinator's determination (i.e. eight identified areas along the transmission line on the Clean Energy Link – North).

The ERA is seeking stakeholder feedback on the amendments as proposed in this paper, including the draft new WEM Procedure provided in Appendix 2. The ERA will consider this feedback in developing the procedure change report and updated WEM Procedure, which will take effect on a date specified by the ERA in January 2026.

1. Introduction

This procedure change proposal is published as part of the ERA's review of the WEM Procedure that outlines the method to determine the Benchmark Reserve Capacity Prices. This paper outlines the ERA's proposed amendments to the WEM Procedure for stakeholder consultation.⁸ This paper is structured as follows:

- The rest of Chapter 1 provides background information on the BRCPs, the current WEM Procedure, policy reforms and the procedure change process.
- Chapter 2 discusses the scope of the ERA's review of the WEM Procedure.
- Chapter 3 outlines the various components of the WEM Procedure. Section 3.1 outlines proposed changes to the WEM Procedure, while section 3.2 outlines components of the WEM Procedure that are proposed to remain unchanged.

The draft proposed WEM Procedure is provided in Appendix 2.

The ERA commissioned GHD to provide advice on BESS technical specifications, capital and fixed O&M costs and future cost estimation and adjustments. GHD's report is provided in Appendix 4.

1.1 Background

To ensure the reliable supply of electricity, generation needs to continuously meet consumer demand. To achieve this in Western Australia, the Reserve Capacity Mechanism provides an investment signal to install capacity in the South West Interconnected System (SWIS).

The Australian Energy Market Operator (AEMO) procures capacity two years in advance of a Capacity Year.⁹ AEMO uses the Planning Criterion to conduct the Long-Term Projected Assessment of System Adequacy outlined in ESM Rules to establish the reserve capacity targets, which is the level of capacity required to maintain system reliability.¹⁰

AEMO then invites capacity suppliers to offer their capacity and assigns Capacity Credits to those suppliers consistent with their estimated contribution to meeting the Planning Criterion.¹¹ Capacity suppliers receive payments consistent with the number of Flexible Capacity Credits and Peak Capacity Credits they hold, and in return, commits to making that capacity available over the associated Capacity Year. If a Capacity Credit holder does not make the capacity available that is associated with those credits, they must pay refunds.¹²

⁸ To amend a WEM Procedure, the ERA must publish a procedure change proposal which includes the proposed amendment to the WEM Procedure and the reasons for the amendment. Electricity System and Market Rules (WA), 30 October 2025, Rule 2.10.6, ([online](#)).

⁹ A Capacity Year commences on 1 October each year. For example, the 2028/29 Capacity Year commences on 1 October 2028. Electricity System and Market Rules (WA), 30 October 2025, Rule 4.6.1 and 4.6.1A, ([online](#)).

¹⁰ Electricity System and Market Rules (WA), 30 October 2025, Rule 4.5.9, ([online](#)).

¹¹ A capacity credit is a notional unit equivalent to 1 MW of either peak capacity or flexible capacity provided by a facility during a Capacity Year. A Facility can hold peak Capacity Credits and flexible Capacity Credits for the same MW of capacity, but it cannot hold more flexible Capacity Credits than peak Capacity Credits. For example, a facility with 100 MW nameplate capacity could receive up to 100 MW of peak Capacity Credits and 100 MW of flexible Capacity Credits. Each product has separate peak and flexible reserve capacity obligation quantities.

¹² Except in the case of planned outages which have been authorised by AEMO. Refunds are not paid for planned outages.

The ESM Rules specify a Peak Reserve Capacity Price curve and Flexible Reserve Capacity Price curve to calculate the price of their respective Capacity Credits, expressed in dollars per MW, per Capacity Year (\$/MW/Year).¹³ The Capacity Credit prices depend on the BRCPs, the level of excess capacity in the WEM and the reserve capacity targets required to meet the Planning Criterion.¹⁴

The ERA determines the BRCPs annually using a WEM Procedure that outlines the method and process we follow.¹⁵ The ERA must also review the WEM Procedure at least once every five years or within one year of the Coordinator of Energy's determination of the Benchmark Capacity Providers.^{16,17}

To conduct its review of the WEM Procedure, the ERA must:

- Ensure the WEM Procedure is consistent with the State Electricity Objective, ESM Rules, the *Electricity Industry Act 2004* and *Electricity Industry (Wholesale Electricity Market Regulations) 2004*.¹⁸
- Follow the procedure change process outlined in the ESM Rules and a WEM Procedure.^{19,20} These obligations are summarised in section 1.4.

1.2 Current WEM Procedure

The current WEM Procedure outlines the method to determine the BRCPs based on the expected cost incurred to develop a lithium iron phosphate BESS with 200 MW injection and 800 MWh (4-hour) BESS in Kwinana or Pinjar.

The BRCPs calculation estimates the following components:

- Total capital cost comprising engineering, procurement and construction costs, transmission interconnection costs, fixed fuel cost, land cost, a contingency margin, and cost of capital.
- Fixed O&M costs for the reference facility and the transmission interconnection including fixed network access charges and insurance costs.

These cost components are annualised through a 15-year annuity using a discount rate – currently set equal to the weighted average cost of capital (WACC). The BRCPs are then calculated by dividing the annuity amount by the amount of Capacity Credits expected to be assigned to the reference facility.

¹³ Electricity System and Market Rules (WA), 30 October 2025, Rule 4.29.1, ([online](#)).

¹⁴ The calculation of the BRCP, together with its application in the determination of capacity price, seeks to balance the cost to consumers of procuring Capacity Credits against the benefits to consumers of improving the reliability of electricity supply. Coordinator of Energy, 2023, *BRCP Reference Technology Review, Consultation paper*, p. 9, ([online](#)).

¹⁵ Electricity System and Market Rules (WA), 30 October 2025, Rule 4.16.9.

¹⁶ Ibid, Rule 4.16.9(b).

¹⁷ The Coordinator of Energy determined the Benchmark Capacity Providers on 30 September 2025. See: Energy Policy WA, 2025, *Review of the Benchmark Capacity Providers: Coordinator of Energy Determination* ([online](#)).

¹⁸ Electricity System and Market Rules (WA), 30 October 2025, Rule 2.9.3(a) ([online](#)).

¹⁹ Ibid, Rule 2.10.

²⁰ Energy Policy WA, 2021, *WEM Procedure: Procedure Administration*, ([online](#)).

1.3 Coordinator of Energy's determination of Benchmark Capacity Providers

On 30 September 2025, the Coordinator determined that both Flexible and Peak Benchmark Capacity Providers must be a lithium BESS with 200 MW injection and 1,200 MWh (6-hour) energy storage, and a 330 kV connection.²¹ On 9 October 2025, the Coordinator published an addendum to its determination and specified the location of the Benchmark Capacity Providers to along the Clean Energy Link – North.^{22,23}

The Coordinator also determined that the BRCPs will be calculated on a gross cost of new entry (CONE) basis, consistent with the current approach to determine the BRCPs.

1.4 The procedure change process

The ERA must publish a procedure change proposal that includes the proposed amended drafting for the WEM Procedure and the reasons for those amendments.²⁴ The ERA must seek feedback on its proposal.²⁵ Anyone can make a submission to the ERA using the form provided in Appendix 1.

The ERA may seek advice from the Market Advisory Committee (MAC) when conducting this review.²⁶ The MAC may provide feedback to the ERA through meetings or by delegating its role to a working group of Rule Participants and other stakeholders.²⁷

After considering stakeholder feedback on its proposal, the ERA must publish a procedure change report that outlines:

- The wording of amendments to the WEM Procedure and the reasons for the amendments.
- All submissions received before the submissions due date, a summary of these submissions, and the response of the ERA to the issues raised in those submissions.
- A summary of the views expressed by the MAC or, if the MAC has delegated its role to consider the procedure change proposal to a working group, a summary of the views expressed by that working group.
- A proposed date and time for the amendments to commence, which must, in the ERA's opinion, allow enough time after the date of publication of the procedure change report for rule participants to implement the changes required.²⁸

²¹ Energy Policy WA, 30 September 2025, *2025 Review of the Benchmark Capacity Providers: Coordinator of Energy Determination*, ([online](#)).

²² Energy Policy WA, 9 October 2025, *2025 Review of Benchmark Capacity Providers: Coordinator of Energy Determination, Addendum*, p. 1 ([online](#)).

²³ Western Power, Clean Energy Program, Clean Energy Link – North, ([online](#)).

²⁴ Electricity System and Market Rules (WA), 30 October 2025, Rules 2.10.5B and 2.10.6, ([online](#)).

²⁵ The consultation period must be at least 20 business days. The ERA can extend the consultation period at its discretion by publishing a notice of extension. Electricity System and Market Rules (WA), 30 October 2025, Rules 2.10.7, 2.10.17 and 2.10.18, ([online](#)).

²⁶ Ibid, Rule 2.10.9.

²⁷ Ibid, Rule 2.3.17.

²⁸ Ibid, Rules 2.10.10 and 2.10.12B, 2.10.13.

1.4.1 Engagement with the Market Advisory Committee

At the MAC meeting on 4 September 2025, the ERA Secretariat sought the MAC's views on whether it would convene a working group to inform the BRCP WEM Procedure review.²⁹ The MAC Chair consulted with MAC members, ultimately deciding that the MAC would provide feedback to the ERA directly at a future MAC meeting.

At the MAC meeting on 16 October 2025, the ERA Secretariat discussed the proposed scope and timeline for the WEM Procedure review.³⁰

The ERA will discuss this proposal with the MAC at its upcoming meeting on 20 November 2025 and include the MAC's feedback in its procedure change report.

1.4.2 Call for submissions

The ERA is seeking stakeholder feedback on its proposed amendments to the WEM Procedure.

Stakeholders are encouraged to seek clarification or further details on the contents of this WEM Procedure if required. The ERA Secretariat will host an industry stakeholder workshop during the consultation period.

The ERA intends to complete its review by mid-January 2026 so the updated WEM Procedure is in effect for the ERA's determination of the 2026 BRCPs, which applies to the 2028/29 Capacity Year and must be completed by 16 March 2026.³¹

To support its review of the WEM Procedure, the ERA is particularly interested in receiving responses to the questions presented throughout the paper, which are also listed below.

²⁹ Market Advisory Committee, 4 September 2025, Meeting Minutes – Item 6(d), ([online](#)).

³⁰ Market Advisory Committee, 16 October 2025, Meeting Minutes – Item 6, ([online](#)).

³¹ Electricity System and Market Rules (WA), 30 October 2025, Rules 1.68.1, ([online](#)).

Questions for stakeholders

General questions from ‘Procedure Change Proposal – Submission Form’:

1. Please provide your views on the procedure change proposal, including any objections or suggested revisions.
2. Please provide an assessment on whether the Procedure Change Proposal is consistent with the State Electricity Objective and the ESM Rules.
3. Please indicate if the procedure change proposal will have any implications for your organisation (for example changes to your IT or business systems) and any costs involved in implementing these changes.
4. Please indicate the time required for your organisation to implement the changes, should they be accepted as proposed.

Specific questions for this procedure review:

5. Is the proposed approach to ensure the Benchmark Capacity Providers receive their full capacity credit allocation by requiring the build to account for derating and non-operational degradation (i.e. “oversizing”), still reasonable?
6. Is it reasonable for the WEM Procedure to *not* specify the degree of sizing required for the Benchmark Capacity Providers to achieve 200 MW of injection capacity and 1,200 MWh of energy storage?
7. Is estimating the land costs as a single, average land cost based on average land prices across the Clean Energy Link – North a reasonable approach for determining land costs?
8. Is lithium iron phosphate BESS still a reasonable lithium sub-chemistry, and should it continue to be specified in the Procedure?
9. Is the current approach to estimate capital costs reasonable to account for all capital costs associated with the Benchmark Capacity Providers?
10. Are the fixed operation and maintenance (O&M) cost components outlined in the WEM Procedure still appropriate?
11. Is the approach to estimate and adjust costs to apply as of 1 April of Year 3 of the Reserve Capacity Year appropriate?

2. Scope of the ERA's review

To scope this review, the ERA considered the purpose of the RCM in providing appropriate price signals for capacity providers to participate in the RCM and ensure there is sufficient capacity in the SWIS.

The ERA considers that the objective of its review, consistent with its previous review, is to update a WEM Procedure to annually determine Flexible BRCP and Peak BRCP that:

- Reflects the Coordinator of Energy's determination of the Benchmark Capacity Providers, including the technical parameters and location of the technology.
- Can be used in conjunction with the capacity demand curve used to determine the Reserve Capacity Price.
- Includes:
 - All reasonable and material costs expected to be incurred in the development of the Benchmark Capacity Providers, including capital expenditure and fixed O&M costs incurred in developing and operating the facility in the WEM.
 - A reasonable method to annualise costs which suitably aligns with investor's practice in raising funds and developing the Benchmark Capacity Providers.
- Allows the ERA to undertake a technical bottom-up cost evaluation of the entry of the Benchmark Capacity Providers in the SWIS for the relevant Capacity Year.
- Is clear and unambiguous in its interpretation; provides certainty to industry on how the BRCPs will be determined annually; and complements energy market reforms.
- Is consistent with the State Electricity Objective, ESM Rules, the *Electricity Industry Act (2004)* and WEM Regulations.

The ERA sought technical advice from GHD, Landgate and Western Power to inform its review and identify the material changes to the BRCPs calculation expected due to the change in Benchmark Capacity Providers. This informed the assessment of which cost components must be updated. The ERA also considered if the change in reference technology changes investors' expectations of future cashflows, and how that may affect the method to annualise costs in the BRCP calculation.

2.1 Matters outside the ERA's scope

As part of this review, the ERA has not reviewed the parameters of the BRCP that are within the Coordinator of Energy's determination of Benchmark Capacity Providers, such as the appropriateness of the reference technology, its technical parameters and location.³²

The ERA has not considered a BESS investor's expected revenue streams from the Real-Time Market or Frequency Co-optimised Essential System Services markets that could offset the BESS's capital costs. This is in line with the Coordinator's determination that the BRCPs

³² Electricity System and Market Rules (WA), 30 October 2025, Rule 4.16.12, ([online](#))

must be calculated on a gross CONE basis and to not consider expected revenues from participation in the Real-Time Market.³³

Given the Coordinator has determined an unconstrained network location for the Benchmark Capacity Providers along the Clean Energy Link – North, the application of the network access quantities will not affect the allocation of Capacity Credits to the Benchmark Capacity Provider, and subsequently the method to determine the BRCPs.³⁴

2.2 Summary of proposed changes

Chapter 3 outlines components of the current WEM Procedure that will be updated and those that will remain the same to determine the 2026 BRCPs.

Given the Coordinator's determination that both Flexible and Peak Benchmark Capacity Providers are the same reference technology, the ERA will apply the same method to determine both Flexible BRCP and Peak BRCP, consistent with the current approach.^{35,36} As a result, a reference to the BRCPs in the WEM Procedure is a reference to both the Flexible BRCP and the Peak BRCP, unless particularly expressed.

The ERA proposes the following changes to the WEM Procedure:

- BESS technical specifications and operating assumptions to give effect to the Coordinator's determination of the Benchmark Capacity Providers. This is further discussed in section 3.1.1.
- Land size as a component of capital cost: The ERA proposes to increase the expected land size to 7.3 hectares. This is based on advice from GHD to account for a larger BESS area. This is further discussed in section 3.1.2.
- Change in the location as required by the Coordinator's determination (i.e. eight identified areas along the transmission line on the Clean Energy Link – North).

The ERA proposes the following aspects remain unchanged in the WEM Procedure:

- Lithium iron phosphate as the BESS sub-chemistry, given it remains the benchmark for reliability and market acceptance for BESS in Australia.
- Capital cost and fixed O&M cost components, as these cost drivers are typical of BESS facilities.

³³ Energy Policy WA, 2025, *2025 Review of the Benchmark Capacity Providers: Coordinator of Energy Determination*, p. 4, ([online](#)).

³⁴ The network access quantity is a new element of the RCM that provides a cap on the amount of Capacity Credits a facility can receive based on the available network capacity at the relevant connection point. AEMO determines each facility's network access quantity. See: Electricity System and Market Rules (WA), 30 October 2025, Clause 4.15, ([online](#)).

³⁵ Facilities receiving Flexible Capacity Credits must meet all the same requirements as Peak Capacity Credits and the ramping requirements as determined by the Coordinator of Energy. These include a requirement for daily generation, a ramp rate of 100 per cent of capacity in 30 minutes, 30 minutes start time and minimum online generation of 25 per cent. A facility can receive both peak and flexible Capacity Credits. *Wholesale Electricity System and Market Rules (WA)*, 30 October 2025, Rule 4.20.5A(a), ([online](#)).

³⁶ The design specification and assumptions are summarised in section 3.1.1 of this paper and detailed in GHD's report. GHD's draft report is provided in Appendix 4. See: GHD's draft report is provided in Appendix 4, *Benchmark Lithium BESS costs, WEM Procedure - BRCP Update*, Report for the Economic Regulation Authority, p.5.

- An annuity tilt of 1.0 to provide certainty to investors and mitigate the variability of yearly changes in cost.
- Annualisation of capital costs over a 15-year period, consistent with investors' expectations and provides the certainty for investors.³⁷
- Discount rate of the weighted average cost of capital (WACC). BESS-specific WACC parameters (for example, equity beta) were derived when the reference technology changed from an open cycle gas turbine to a BESS in 2024 and remain unchanged.³⁸

Table 1 presents a summary of the current operational assumptions for the flexible and peak capacity providers that will be retained and those that will be updated.

Table 1: Summary of proposed changes to the WEM Procedure

Parameter	Current WEM Procedure	Proposed WEM Procedure
BRCP Requirements		
Capacity	200 MW Injection	Retained
Operational duration	4 hours (800 MWh)	6 hours (1,200 MWh)
Operating temperature	41°C	Retained
Lithium sub-chemistry	Lithium-iron phosphate (LFP)	Retained
BESS technical life (years)	Up to 20 years (warranty may be shorter)	Retained
Finance term	15 years	Retained
Land requirements	6.5 hectares	7.3 hectares
Operational assumptions		
Peak	1 cycle per day, full charge and discharge	Retained
Flexible	1 cycle per day, full charge and discharge	Retained

Source: GHD report (Appendix 4).

³⁷ Economic Regulation Authority, 2024, *Procedure Change Report: Benchmark Reserve Capacity Prices [EEPC_2024_01]*, 26 July 2024, p. 35 ([online](#)).

³⁸ Ibid, p. 38 ([online](#)).

3. Review of the WEM procedure

3.1 Procedural elements proposed to be updated

3.1.1 BESS energy storage

The Coordinator determined that both Flexible and Peak Benchmark Capacity Providers must provide 200 MW of injection capacity and 1,200 MWh of energy storage. Given the Benchmark Capacity Providers are BESSs, which are classified as electric storage resources in the ESM Rules, they are expected to receive Capacity Credits based on their ability to operate and discharge electricity over the six-hour obligation period at an ambient temperature of 41 degrees Celsius.^{39,40}

The ERA proposes to retain its approach to ensure that the Benchmark Capacity Providers receives its expected capacity credits (200 MW) by ensuring that the build is sufficient to allow it to provide the required power capability and energy capacity on its first day of operation, that is, on 1 October in Year 3 of a Reserve Capacity Cycle.

This requires “oversizing” the BESS to account for:

- Capacity degradation caused by “calendar fade” and high ambient temperatures.⁴¹
- Power capacity characteristics that can vary based on the requirements in the ESM Rules.⁴²

The ERA maintains that the WEM Procedure will *not* specify the sizing required to achieve the required energy and power capacity, given the energy and power capacity requirements can vary based on BESS design, technological maturity and the ESM Rule requirements. This is consistent with GHD’s recommendation.⁴³

The ERA proposes that the WEM Procedure will specify that the Benchmark Capacity Providers must have installed capacity and energy storage to provide 200 MW of injection capacity with 1,200 MWh of energy storage at 1 October of Year 3 of the Reserve Capacity Cycle.

Proposed amendment

- Clause 2.1.6(c) require the Benchmark Capacity Providers to have enough energy storage capacity to enable 1,200 MWh charge and discharge on 1 October of Year 3 of the Reserve Capacity Cycle.

³⁹ Electricity System and Market Rules (WA), 30 October 2025, Rules 4.10.1(fA)(ii), 4.11.3 and 4.11.3A, ([online](#)).

⁴⁰ Australian Energy Market Operator, 2025, *Wholesale Electricity Market Electricity Statement of Opportunities*, p. 11 ([online](#)).

⁴¹ Calendar fade occurs where a battery incurs time-based degradation, which is degradation that results irrespective of whether or how the battery is operated. This is further explained in GHD’s report.

⁴² For instance, the ESM Rules specify certain voltage stability requirements and generator performance standards that require the BESS to ensure sufficient reactive power at the point of connection and continuous control of reactive power compensation. Electricity System and Market Rules (WA), 30 October 2025, Rules A12.4.2, A12.3.3.3, ([online](#)).

⁴³ GHD’s draft report is provided in Appendix 4. See: GHD, 2025, *Benchmark Lithium BESS costs, WEM Procedure BRCP Update*, Report for the Economic Regulation Authority, p.6.

Questions for stakeholders

5. Is the proposed approach to ensure the Benchmark Capacity Providers receive their full capacity credit allocation by requiring the build to account for derating and non-operational degradation (i.e. “oversizing”), still reasonable?
6. Is it reasonable for the WEM Procedure to *not* specify the degree of sizing required for the Benchmark Capacity Providers to achieve 200 MW of injection capacity and 1,200 MWh of energy storage?

3.1.2 Land costs

The current WEM Procedure outlines the approach to estimate land costs, which is based on a 6.5-hectare land area in the Pinjar and Kwinana regions. At present, the land cost estimate is based on the average land cost of the two regions as provided by Landgate.

The ERA evaluated if the current land size and method to estimate land costs is appropriate.

3.1.2.1 Size

The capital cost of a Benchmark Capacity Provider must include land costs, which generally includes the cost of land that is sufficient to accommodate the BESS, a substation, and transmission network connection assets such as the Western Power substation and buffer zones.

GHD advised that a larger land size is required, primarily due to additional battery containers required for a 200 MW, six-hour BESS (1,200 MWh).

The ERA proposes to amend the land size specified in the WEM Procedure to 7.3 hectares, based on the expected increase in the BESS facility area (3.8 hectares).⁴⁴ GHD and Western Power advised that land size for the BESS substation, connecting assets to the Western Power substation, including the Western Power substation, and all buffer zones remain the same as the existing Procedure (3.5 hectares).

3.1.2.2 Method to estimate land cost

As noted earlier, the Coordinator has determined that the Benchmark Capacity Providers must be located on a 330kV transmission line located on the Clean Energy Link – North.⁴⁵

The ERA considers the current approach to estimate a single, average land cost based on average land prices across the location determined by the Coordinator remains appropriate.⁴⁶

The ERA proposes the WEM Procedure be updated to specify a single land cost based on the average land price of the following eight locations on the Clean Energy Link – North:

⁴⁴ GHD’s draft report is provided in Appendix 4. See: GHD, 2025, *Benchmark Lithium BESS costs, WEM Procedure BRCP Update*, Report for the Economic Regulation Authority, pp 8-9.

⁴⁵ The Coordinator of Energy determined the Benchmark Capacity Providers on 30 September 2025 and made an addendum to the location of the determination on 9 October 2025. See: Energy Policy WA, *2025 Review of the Benchmark Capacity Providers: Coordinator of Energy Determination* ([online](#)), and Energy Policy WA, *2025 Review of the Benchmark Capacity Providers: Coordinator of Energy Determination Addendum* ([online](#)).

⁴⁶ For the 4-hour BESS, the ERA calculated a single average price based on generic prices across both the Pinjar and Kwinana regions. The ERA proposes to retain the method of averaging a single land cost across the eight locations on the Clean Energy Link- North regions

1. Three Springs
2. Eneabba
3. Badgingarra
4. Cataby
5. Gingin
6. Muchea
7. Pinjar
8. Neerabup

Proposed Amendment

- Clause 3.5.4 and 3.5.7 require the ERA to estimate land costs to accommodate the Benchmark Capacity Providers based on the average land cost on the eight locations on the Clean Energy Link North.
- Clauses 3.5.4 and 3.5.5 require the land valuer to assess the Clean Energy Link - North locations and estimate land costs of a 7.3-hectare area within each of these locations.

Question for stakeholders

7. Is estimating the land costs as a single, average land cost based on average land prices of eight regions across the Clean Energy Link – North a reasonable approach for the WEM Procedure?

3.2 Procedural elements proposed to be retained

3.2.1 BESS sub-chemistry

The Coordinator determined that the Peak and Flexible Benchmark Capacity Providers must be a lithium BESS. Lithium battery cells consist of various sub-chemistries.⁴⁷ Battery chemistries affect the characteristics of a BESS, including cost, cycle life, operational characteristics, and the investor's expected cashflows.

The ERA sought advice from GHD if the current sub-chemistry specified in the BRCP Procedure – lithium iron phosphate (LFP) – remains appropriate.

GHD advised that the LFP sub-chemistry remains an investors' technology of choice and has the best technical characteristics – such as cost, life span, safety risk, performance and energy density – compared to other lithium sub-chemistries.⁴⁸ GHD also noted that there is a high adoption of LFP in major grid-scale BESS projects across Australia. GHD recommended that

⁴⁷ For instance, common lithium sub-chemistries include nickel manganese cobalt (NMC). GHD's draft report is provided in Appendix 4. See: GHD, 2025, *Benchmark Lithium BESS costs, WEM Procedure - BRCP Update*, Report for the Economic Regulation Authority, p 6.

⁴⁸ GHD's draft report is provided in Appendix 4. See: GHD, 2025, *Benchmark Lithium BESS costs, WEM Procedure - BRCP Update*, Report for the Economic Regulation Authority, p.6.

the sub-chemistry be reviewed by August 2027 given the speed of technological advancement.⁴⁹

The ERA proposes to retain LFP as the sub-chemistry in the WEM Procedure, and will review the appropriateness of specifying LFP as the sub-chemistry in future reviews of the WEM Procedure.

Questions for stakeholders

8. Is lithium iron phosphate BESS still a reasonable lithium sub-chemistry, and should it continue to be specified in the Procedure?

3.2.2 Capital costs

GHD advised that there are various other capital cost components, apart from land cost, of the Benchmark Capacity Providers.⁵⁰ These cost components are not expected to vary materially between a four-hour and six-hour BESS, although they may vary in quantum.

As a result, the ERA does not propose to change the following existing capital cost components as specified in the WEM Procedure:

- Direct and upfront costs involved in:
 - Connecting and registering a BESS to the SWIS so it can operate in the WEM. These include:
 - Network connection agreement with Western Power.⁵¹
 - Market registration and certification of reserve capacity with AEMO.
 - Obtaining a generation licence from the ERA.
 - Obtaining environmental and development approvals associated with the development and construction of the BESS.
 - Obtaining project management and owner's engineer services, which include costs incurred by the BESS developer on feasibility studies, construction management and project management.
 - Legal, financing and insurance costs incurred in the development and construction of the BESS.
- Supply and installation costs:
 - Battery containers or enclosures that typically include racks of battery modules, thermal management systems such as air conditioning or liquid cooling, control equipment, and a fire suppression system.

⁴⁹ GHD's draft report is provided in Appendix 4. See: GHD, 2025, *Benchmark Lithium BESS costs, WEM Procedure - BRCP Update*, Report for the Economic Regulation Authority, p.6.

⁵⁰ Ibid, p.10.

⁵¹ The BESS proponent must negotiate a network connection agreement with Western Power – and AEMO, which reviews certain aspects of the agreement – by developing a high-level concept design with a breakdown of shared assets and connection assets. BESS procurement and construction can generally begin after the network connection agreement is formed. GHD's draft report is provided in Appendix 4. See: GHD, 2025, *Benchmark Lithium BESS costs, WEM Procedure - BRCP Update*, Report for the Economic Regulation Authority, p. 11.

- Power conversion systems that typically include multiple inverters placed near the battery containers.
- Electrical and control balance of plant that are infrastructure costs incurred in developing the Benchmark Capacity Providers and typically include all enabling electrical infrastructure, cables, conduits, transformers, switchgear, protection and control equipment for the BESS and its substation.
- Civil balance of plant that are infrastructure costs incurred in developing the Benchmark Capacity Providers that typically includes the foundations, transformer bunds, and equipment pads for the BESS and its substation.
- Installation labour and temporary equipment hire that typically includes local construction labour to develop the site and install the BESS, as well as the hiring of temporary equipment during the BESS construction phase.
- Transmission connection costs, which generally include the costs incurred to connect the facility to Western Power's transmission network and all associated infrastructure, such as:
 - A 330 kV transmission substation that can serve as the dedicated 330 kV connection point for the BESS and connect to Western Power's transmission network.
 - A BESS substation that can step up the system voltage of the BESS (33 kV) to Western Power's network voltage (330 kV).
 - The connecting transmission lines.⁵²

Questions for Stakeholders

9. Is the current approach to estimate capital costs reasonable to account for all capital costs associated with the Benchmark Capacity Providers?

3.2.3 Fixed O&M costs

The ERA sought advice from GHD on fixed O&M cost components of the BESS.⁵³ GHD advised that fixed O&M costs are largely unchanged from the current Procedure:

- Service, inspection and preventative maintenance of the BESS, which typically include costs of electrical testing, inspections and preventative maintenance on the primary and secondary electrical equipment, structures, footing, buildings and civil items as well costs of section, inspection and preventative maintenance of inverter stations, battery modules, racks, energy management system, earthing and protection.
- Fixed costs for corporate overheads and various consulting services, which typically include superannuation contributions, work cover contributions, technical engineering support, ongoing legal and regulatory costs.
- Local government rates.

⁵² The ERA has proposed adding "Any other reasonable fixed transmission capital costs" to the existing list of transmission capital costs, to future proof the Procedure for any transmission network upgrades.

⁵³ GHD's draft report is provided in Appendix 4. See: GHD, 2025, GHD's draft report is provided in Appendix 4. See: GHD, 2025, *Benchmark Lithium BESS costs, WEM Procedure - BRCP Update*, Report for the Economic Regulation Authority, p14.

- Site security services for monitoring and oversight of the BESS.
- Fixed O&M costs of transmission connection assets, which include overheads, hire equipment and labour costs for routine maintenance of the connection switchboard and transmission line.
- Transmission storage service charges for use of the Western Power network.⁵⁴

As a result, the ERA does not propose any changes to the fixed O&M cost components as identified in the current Procedure.

Questions for stakeholders

10. Are the fixed O&M cost components outlined in Section 5.1 of the WEM Procedure still appropriate?

3.2.4 Annualisation

The BRCP's annualisation approach allows an annual payment to be determined over the project to ensure the return of capital (depreciation) and return on capital (financing costs). The annualisation calculation requires the determination of the following four factors to allocate capital and financing costs over the project's life:

- capital costs (sections 3.1.2 and 3.2.2)
- annuity period (section 3.2.4.1)
- rate of return (3.2.4.2)
- annuity tilt (section 3.2.4.3).

3.2.4.1 Annuity period

The BRCP is based on the annualised capital cost of the Benchmark Capacity Providers, which requires an estimate of the period to annualise costs over the annuity period. The annuity period represents the period over which capital charges are recovered. The greater the annuity period, the lower the annual payment will be and the longer it will take for an investor to recover the return of capital (depreciation) and return on capital (financing costs).

The ERA proposes to retain the current 15-year annuity period (Clause 2.2.3(a)(ii)) in the WEM Procedure.

The ERA has considered the guardrails of the BESS technology's end of the warranty period and expected technical life. The ERA acknowledges that the 15-year period may expose investors to risk if the warranty life is shorter, which can occur depending on the type of warranty and the operation of the battery. However, the 15-year period does not unduly extend capital recovery well into the future to some uncertain technical life – given that the BESS is still a maturing technology – which may act as a disincentive to investment. A 15-year annuity

⁵⁴ A BESS must pay to access and use the Western Power network. The Western Power 2025-26 Price List sets out the charges for users connected to its network. Western Power price list sets out the price of their transmission services charges, ([online](#)).

period also aligns with investors' expectations and typical project financing periods, while also remaining consistent with the current WEM Procedure's annuity period.

3.2.4.2 *Rate of return*

The rate of return provides for the funding costs required by investors to provide investment capital for the project and compensates investors for the risk of committing funds. The rate of return is usually determined based on calculating debt and equity costs on a benchmark basis and weighting those costs to form a WACC.

The WACC's purpose in the BRCP determinations:

- Represents a long-term required rate of return.
- Is used in an annuity calculation to calculate an annual compensation amount to the investor for capital costs over the life of the asset.
- Is updated annually to reflect efficient financing costs at a point in time.

The ERA proposes to retain a nominal pre-tax WACC and the following WACC parameters as per the current WEM Procedure:

- Annual components, which require review each year and comprise the risk free rate, debt risk premium and corporate tax rate.
- Fixed components, which are fixed in the WEM procedure. These components include the market risk premium, equity beta, debt issuance costs, franking credit value and gearing ratio.

3.2.4.3 *Annuity tilt*

The current BRCP Procedure uses a constant annuity for the recovery of capital costs via an annualisation process. The payment consists of a return of capital (depreciation) and a return on (financing costs) capital. A constant annuity provides the same annual payment for the life of the annuity.

The tilt acts as a mechanism to address investors' expectations of future decreases in BESS capital costs, due to technological advances and manufacturing economies of scale, to appropriately incentivise investment in capacity.

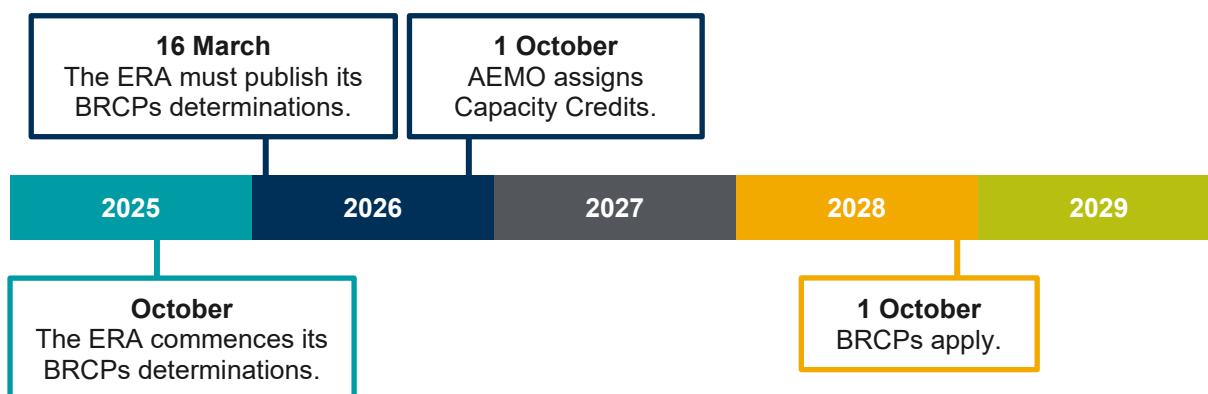
The ERA proposes that the tilt factor remain fixed at 1.0 as per the current WEM Procedure in Section 4.1. This provides more certainty to investors and is not unduly affected by the variability of yearly changes in cost. BESS costs are likely to stabilise as the BESS technology matures.

3.2.5 *Cost estimation and adjustment method*

The BRCPs are based on the annualised cost estimate of the Benchmark Capacity Providers that are constructed to provide capacity to the SWIS for a Capacity Year commencing approximately two years into the future.

For the 2026 Reserve Capacity Cycle, the ERA must publish the Benchmark Reserve Capacity Prices prior to 16 March 2026.⁵⁵ The ERA must review the WEM Procedure within the timeframe required to meet this deadline.⁵⁶ The BRCP applies from 1 October in Year 3 (Figure 1).⁵⁷

Figure 1: Simplified timeline of the 2026 Reserve Capacity Cycle



Source: ERA interpretation of ESM Rules.

To receive revenue from Capacity Credits, a facility must be available from 1 October of a reserve Capacity Year. However, an investor is likely to schedule completion of the construction of the new facility a few months in advance of 1 October, to account for any construction overruns and allow for facility commissioning.⁵⁸

For computational simplicity, the ERA proposes to retain the assumption that capital works are completed by 1 April of a reserve Capacity Year (that is, six months in advance of the date that the BRCP applies). This is consistent with the assumption in the current WEM Procedure.

The BRCP determinations must account for cost changes between the date of the BRCP determination and when the BRCPs apply. This analysis will depend on the nature of the cost estimation approach and whether the costs are reasonably expected to change over time.⁵⁹ For instance, construction labour costs are expected to vary year on year due to changes in wages and inflation.⁶⁰

The current WEM Procedure specifies that the ERA must adjust:

- Capital costs using a reasonable adjustment method where the costs are reasonably expected to change over time between the date of the ERA's determination and 1 April of Year 3 of the Reserve Capacity Cycle. The determination of capital costs as of 1 April assumes that capital outflows are largely incurred in advance of the Benchmark Capacity Providers commencing operation and receiving revenue from Capacity Credits on 1 October.

⁵⁵ Electricity System and Market Rules (WA), 30 October 2025, Rule 1.68.1, ([online](#)).

⁵⁶ Ibid, Rule 1.68.2.

⁵⁷ Electricity System and Market Rules (WA), 30 October 2025, Chapter 4, ([online](#)).

⁵⁸ Electricity System and Market Rules (WA), 30 October 2025, Rule 3.21A, ([online](#)).

⁵⁹ Ibid, Rule 4.16.4.

⁶⁰ GHD suggested various cost drivers and suggested data sources for cost escalation. GHD's draft report is provided in Appendix 4. See: GHD, 2025, *Benchmark Lithium BESS costs, WEM Procedure - BRCP Update*, Report for the Economic Regulation Authority, p13

- Fixed O&M costs using a reasonable adjustment method where the costs are reasonably expected to change over time between the date of the ERA's determination and 1 October of Year 3 of the Reserve Capacity Cycle. The determination of fixed O&M costs as of 1 October assumes that these costs will be incurred after the Benchmark Capacity Providers commence operation and start receiving revenue from Capacity Credits on 1 October.

The approach to cost adjustment in the current WEM Procedure will be retained so that estimates for capital costs are made as of 1 April and fixed O&M costs as of 1 October in Year 3 of the Reserve Capacity Cycle.

Questions for stakeholders

11. Is the approach to estimate and adjust costs to apply as of 1 April of Year 3 of the Reserve Capacity Year still appropriate?

Appendix 1 WEM procedure change proposal submission form

Anyone can make a submission relating to a Procedure Change Proposal during the period indicated for public submissions.

Submissions can be made using the WEM Procedure Change Proposal submission form provided overleaf.⁶¹ Page i of this proposal provides further guidance on how to make a submission to the ERA.

⁶¹ Energy Policy WA, 2025, *WEM Procedure changes*, ([online](#)).

WHOLESALE ELECTRICITY MARKET

Submission to Procedure Change Proposal

EEPC_2025_01

WEM Procedure: Benchmark Reserve Capacity Prices

Submitted by

Name:

Phone:

Email:

Organisation:

Address:

Date submitted:

Submission

Clause 2.10.7 of the Electricity System and Market Rules provides that any person may make a submission for a Procedure Change Proposal (including proposals developed by AEMO, the Economic Regulation Authority, the Coordinator of Energy or a Network Operator) by completing this Procedure Change Submission form.

Submissions should be provided by email to the nominated contact in the call for submissions published with the Procedure Change Proposal.

Please provide your views on the Procedure Change Proposal, including any support, objections, or suggested revisions.

Please provide an assessment of whether the Procedure Change Proposal will better facilitate the achievement of the State Electricity Objective and the Electricity System and Market Rules.

Please indicate if the Procedure Change Proposal will have any implications for your organisation (for example changes to your IT or business systems/processes) and any costs involved in implementing the changes.

Please indicate the time required for your organisation to implement the change, should it be accepted as proposed.

Appendix 2 Proposed WEM Procedure (draft)

The proposed draft of the updated *WEM Procedure: BRCP* (version 9) is available on the ERA's website ([online](#)).

Appendix 3 Current WEM Procedure

The current *WEM Procedure: BRCP* (version 8) is available on the ERA's website ([online](#)).

Appendix 4 GHD draft report

The ERA engaged GHD to provide advice on the cost components, estimation method and drivers of BESS technologies for the purpose of reviewing and updating the WEM Procedure.

GHD's draft report is available on the ERA's website ([online](#)).

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