



Government of **Western Australia**  
Department of **Mines, Industry Regulation and Safety**  
**Energy Policy WA**

# Final Rule Change Report Method used for the assignment of Certified Reserve Capacity to Intermittent Generators (RC\_2019\_03)

Standard Rule Change Process

21 September 2023

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Method used for the assignment of Certified Reserve Capacity to Intermittent Generators  
(RC\_2019\_03)*

**Energy Policy WA**

Level 1, 66 St Georges Terrace  
Perth WA 6000

Locked Bag 100, East Perth WA 6892  
Telephone: 08 6551 4600

[www.energy.wa.gov.au](http://www.energy.wa.gov.au)  
ABN 84 730 831 715

*Enquiries about this report should be directed to:*

Telephone: 08 6551 4600  
Email: [energymarkets@dmirs.wa.gov.au](mailto:energymarkets@dmirs.wa.gov.au)

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# 1. The Rule Change Proposal, Process and Timeline

On 17 December 2020, the Economic Regulation Authority (ERA) submitted a Rule Change Proposal titled 'Method used for the assignment of Certified Reserve Capacity to Intermittent Generators' (RC\_2019\_03).

Intermittent Generators are assigned Certified Reserve Capacity (CRC) based on the Relevant Level Methodology (RLM). This Rule Change Proposal sought to replace the current RLM with a new method that was recommended by the ERA following its 'Review of the method used to assign capacity to Intermittent Generators 2018' (RLM Review).<sup>1</sup>

This proposal was processed using the Standard Rule Change Process, described in section 2.7 of the Wholesale Electricity Market (WEM) Rules.

The Rule Change Proposal was submitted to the Rule Change Panel, and the Panel extended the timeframe for processing the proposal under clause 2.5.10 of the WEM Rules on several occasions. Extension Notices were published on:

- 20 January 2021;
- 12 April 2021;
- 30 June 2021.
- 2 March 2021;
- 11 June 2021; and

The timeline for assessing this Rule Change Proposal was initially extended to give AEMO time to review the Rule Change Proposal and to draft a submission. The timeline was then extended to allow the Rule Change Panel sufficient time to assess the proposal and prepare the Draft Rule Change Report. Following publication of the Draft Rule Change Report, the Rule Change Panel granted further extensions to provide it with additional time to consider the complex issues raised in the consultation on the Draft Rule Change Report.

Responsibility for administration of the WEM Rules was transferred from the Rule Change Panel to the Coordinator of Energy (Coordinator) on 1 July 2021, at which point the Coordinator became responsible for processing RC\_2019\_03.

The Coordinator granted two further extensions on 31 December 2021 and 31 December 2022 to provide it with sufficient time to consider RC\_2019\_03, and a related Rule Change Proposal titled 'Capacity Credit Allocation for Intermittent Generators' (RC\_2018\_03), in light of the Coordinator's Reserve Capacity Mechanism (RCM) Review.<sup>2</sup>

The Coordinator has now concluded the RCM Review,<sup>3</sup> which has addressed the matters considered by RC\_2019\_03, among other things. The Review Outcomes have been published in the information papers at the conclusion of Stages 1 and 2 of the RCM Review.

<sup>1</sup> Full information on the ERA's RLM Review is available at <https://www.erawa.com.au/electricity/wholesale-electricity-market/methodology-reviews/review-of-method-used-to-assign-capacity-to-intermittent-generators-2018>.

<sup>2</sup> Full information on RC\_2018\_03 is available at [Rule Change: RC\\_2018\\_03 \(www.wa.gov.au\)](https://www.wa.gov.au/government/document-collections/rule-change-rc-2018-03).

<sup>3</sup> Full information on the RCM Review is available at <https://www.wa.gov.au/government/document-collections/reserve-capacity-mechanism-review>, including the Scope of Work for the review, the *Reserve Capacity Mechanism Review Stage 1 Consultation Paper*, the *Reserve Capacity Mechanism Review: Information Paper (Stage 1) and Consultation Paper (Stage 2)*, submissions to both consultation papers and the *Reserve Capacity Mechanism Review: Information Paper (Stage 2)*.

WEM Amending Rules were drafted under Stage 3 of the RCM Review to implement the Review Outcomes from Stages 1 and 2. The draft WEM Amending Rules were published on 14 September 2023 and submissions on the draft Amending Rules are due by 5:00 PM (AWST) on 19 October 2023.<sup>4</sup>

The Minister for Energy is expected to make the WEM Amending Rules in late 2023.

The key dates for progressing this Rule Change Proposal are:



This Final Rule Change Report has been developed under clause 2.7.7A(b) of the WEM Rules on the basis that the stakeholder has read all of the related documents, including the Rule Change Proposal, the first period submissions, the Draft Rule Change Report and the second period submissions.

The Rule Change Notice and all other documents related to this Rule Change Proposal can be found on the Coordinator's website at [Rule Change RC\\_2019\\_03 \(www.wa.gov.au\)](http://www.wa.gov.au).

<sup>4</sup> The draft Amending Rules are available at [Reserve Capacity Mechanism Review \(www.wa.gov.au\)](http://www.wa.gov.au).

## 2. The Coordinator's Decision

The Coordinator's final decision is to reject the Rule Change Proposal.

### 2.1 Reasons for the Coordinator's Decision

The Coordinator has made a final decision to reject RC\_2019\_03 because the issues raised in this Rule Change Proposal were addressed by the RCM Review and will be implemented by the draft WEM Amending Rules currently undergoing public consultation.

The Coordinator, in consultation with the Market Advisory Committee (MAC), has conducted the RCM Review under clause 2.2D.1 of the WEM Rules.<sup>5</sup> The RCM Review has addressed the issues raised in the Rule Change Proposal regarding the allocation of CRC to Intermittent Generators. The Coordinator:

- consulted on the appropriate method for allocating CRC to Intermittent Generators in the *Reserve Capacity Mechanism Review: Stage 1 Consultation Paper* – referred to hereafter as the 'Stage 1 Consultation Paper';<sup>6</sup>
- confirmed the Review Outcomes from Stage 1 of the Review in the *Reserve Capacity Mechanism Review: Consultation Paper (Stage 2) and Information Paper (Stage 1)* – referred to hereafter as the 'Stage 1 Information Paper';<sup>7</sup> and
- made some further changes to the reserve capacity certification arrangements in Stage 2 of the RCM Review, as indicated in the *Reserve Capacity Mechanism Review: Information Paper (Stage 2)* – referred to hereafter as the 'Stage 2 Information Paper'.<sup>8</sup>

Review Outcomes 8 and 11 from the Stage 1 Information Paper deal with the allocation of CRC to Intermittent Generators and address the matters raised in RC\_2019\_03. The Minister for Energy is expected to make WEM Amending Rules to give effect to the outcomes of the RCM Review in late 2023.

The Coordinator considers that:

- the RCM Review addressed the issues raised in RC\_2019\_03, and the RCM Review took account of the Wholesale Market Objectives; and
- the RLM will be amended as a result of the RCM Review and it would be impractical to make further changes to the RLM at this time, as making such changes would come at a cost and will have no benefit.

The detailed analysis regarding the Coordinator's decision is provided in section 6 of this report.

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<sup>5</sup> The MAC established the RCM Review Working Group (RCMRWG) to support the RCM Review. Further information on the RCMRWG is available at <https://www.wa.gov.au/government/document-collections/reserve-capacity-mechanism-review>, including the Terms of Reference for the RCMRWG, membership of the RCMRWG, and the meeting papers and minutes for all RCMRWG meetings.

<sup>6</sup> <https://www.wa.gov.au/system/files/2022-08/EPWA%20-%20Reserve%20Capacity%20Mechanism%20review%20-%20consultation%20paper%201.pdf>.

<sup>7</sup> [https://www.wa.gov.au/system/files/2023-05/epwa\\_reserve\\_capacity\\_mechanism\\_review\\_information\\_and\\_consultation\\_paper.pdf](https://www.wa.gov.au/system/files/2023-05/epwa_reserve_capacity_mechanism_review_information_and_consultation_paper.pdf).

<sup>8</sup> [https://www.wa.gov.au/system/files/2023-08/reserve\\_capacity\\_mechanism\\_review\\_-\\_information\\_paper\\_stage\\_2.pdf](https://www.wa.gov.au/system/files/2023-08/reserve_capacity_mechanism_review_-_information_paper_stage_2.pdf).

## 3. Proposed Amendments

### 3.1 The Rule Change Proposal

This section provides a summary of Rule Change Proposal RC\_2019\_03. The full Rule Change Proposal can be found on the Coordinator's website.

On 4 June 2018, the ERA commenced an RLM Review, as required by clauses 4.11.3C, 4.11.3D and 4.11.3E of the WEM Rules.

The ERA completed the RLM Review in March 2019, and in its final report stated that the current RLM has several shortcomings and does not provide a reasonable forecast of the capacity contribution of Intermittent Generators to the reliability in the South West Interconnected System (SWIS).

On 17 December 2020, the ERA submitted RC\_2019\_03 to the Rule Change Panel. RC\_2019\_03 sought to replace the current RLM with a new RLM that is consistent with the ERA's recommendations from its RLM Review.

The Rule Change Proposal included analyses indicating that most Intermittent Generators would receive a higher CRC under the ERA's proposed RLM than under the current RLM.<sup>9</sup>

The ERA proposed to base the new RLM on the concept of effective load carrying capability (ELCC). The ELCC of a Facility (or group of Facilities) represents the amount of load that can be added to a system if this Facility was added to the system, without increasing the system's loss of load expectation (LOLE). This means that the ELCC is determined as the firm capacity that could replace the assessed Intermittent Generators, without changing the system's LOLE.

The ERA proposed to:

- determine an ELCC for the whole fleet of Intermittent Generators;
- allocate the fleet's ELCC between different groups of Intermittent Generators based on the Facilities' technology type; and
- determine the Relevant Level of the individual Intermittent Generators by allocating the groups' ELCCs between the relevant Facilities based on their relative performance during selected Trading Intervals.

### 3.2 The Rule Change Panel's Initial Assessment of the Proposal

The Rule Change Panel decided to progress this Rule Change Proposal based on its preliminary assessment that the proposal raised a valid issue, and that due consideration should be given to whether the proposal would allow the Market Rules to better address the Wholesale Market Objectives.

On 20 April 2021, the Panel published its Draft Rule Change Report for RC\_2019\_03. The draft decision was to accept the Rule Change Proposal in a modified form including several changes to the ERA's proposed RLM.

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<sup>9</sup> The analysis in the Rule Change Proposal was based on models that did not reflect all aspects of the proposed RLM.

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The Rule Change Panel granted further extensions to the Rule Change Process following publication of the Draft Rule Change Report to provide it with sufficient time to consider the complex issues raised in the consultation on the Draft Rule Change Report.

On 1 July 2021, responsibility for the administration and rule-making functions for the WEM Rules was transferred from the Rule Change Panel to the Coordinator of Energy. As a result, the Coordinator became responsible for progressing this Rule Change Proposal.

## 4. Consultation

Section 4 of this Final Rule Change Report provides summaries of all consultation conducted with respect to RC\_2019\_03, including:

- consultation that was conducted with the MAC and the Coordinator's response to the views of the MAC; and
- submissions made in the first and second submission periods and the Coordinator's response to the issues raised in those submissions.

Although a summary of these consultations is presented below, the Coordinator has considered each matter raised in making its decision on RC\_2019\_03.

### 4.1 Pre-Rule Change Proposal

A summary of the consultation undertaken regarding this Rule Change Proposal prior to transfer of the proposal to the Coordinator is provided in section 5.1 of the Draft Rule Change Report.

### 4.2 The Market Advisory Committee and Further Analysis by the Rule Change Panel

A summary of the consultation conducted with the MAC regarding this Rule Change Proposal prior to publication of the Draft Rule Change Report can be found in section 5.2 of the Draft Rule Change Report.

#### MAC Workshops

The Rule Change Panel published its Draft Rule Change Report for RC\_2019\_03 on 20 April 2021. The draft decision was to accept the Rule Change Proposal in a modified form, including using the 'Delta Method' to allocate CRC rather than the allocation approach proposed by the ERA.

The Draft Rule Change Report included analyses indicating that, under the Delta Method:

- some Intermittent Generators would receive more CRC and some less CRC than under the current RLM; and
- some Intermittent Generators would receive more CRC and some less CRC than under the ERA's proposed RLM.

The Rule Change Panel held two MAC workshops to facilitate stakeholder discussion of its draft decision, including on:

- 10 May 2021 to discuss the Delta Method; and
- 11 May 2021 to discuss the proposed WEM Amending Rules.

Three presentations were made at the 10 May 2021 workshop, including from:

- The Rule Change Panel support team, covering calculation of the fleet's ELCC, volatility of the ELCC, the target LOLE, determination of the Relevant Levels for individual facilities, treatment of small facilities, the RCM timeline, and next steps for processing RC\_2019\_03;
- Alinta Energy, covering its views of the implications of the Delta Method in general and on individual generators; and
- the ERA, covering its views of the implications of the Delta Method.

At the 10 May 2021 MAC workshop, several stakeholders raised concerns about the volatility of the CRC allocations under the Delta Method. The Rule Change Panel recognised that the results of the Delta Method were likely to be volatile because:

- the performance of the Intermittent Generators is highly volatile, including during the system stress events;<sup>10</sup> and
- CRCs under the Delta Method are driven by the performance of the Intermittent Generators during a small number of system stress events.

Market Participants with Intermittent Generators raised concerns that a poor performance during one or more of the few system stress events can negatively affect the CRC of an Intermittent Generator for several Reserve Capacity Cycles.

AEMO, on the other hand, raised concerns that a good performance during one or more of the few system stress events can overinflate the CRC of an Intermittent Generator for several Reserve Capacity Cycles, thus placing system reliability at risk.

The presentations and minutes from this workshop are available on the Coordinator's website.

### MAC Meetings prior to 1 July 2021

At the 8 June 2021 MAC meeting:

- The Chair indicated that a final decision on RC\_2019\_03 may not be made in time for the 2021 Reserve Capacity Cycle.
- Mrs Papps (Alinta) suggested that, based on stakeholder feedback, changes needed to be made to the Delta Method and asked what the plan was for further consultation.
- The Chair noted that the Rule Change Panel's analysis to date indicated that the underlying volatility in both the fleet ELCC and the Delta Method allocations was caused by the peakiness of the SWIS and the volatility of some Intermittent Generators. The Delta Method was not the cause of that volatility.
- Mrs Papps suggested that the ex-ante inclusion of a locational price signal for Intermittent Generators ahead of the Network Access Quantity (NAQ) process appeared to be inconsistent with the treatment of Scheduled Generators, the rights of which under constrained access were being protected.
- Ms Ryan (Energy Policy WA (EPWA)) noted that the Energy Transformation Taskforce did not have a view on the appropriate method for allocating CRC to Intermittent Generators when it designed the NAQ framework.

### Further Analysis by the Rule Change Panel

On 30 June 2021, the Rule Change Panel published an Extension Notice deferring the publication of the Final Rule Change Report because the Rule Change Panel was to be wound up on 1 July 2021 and the Coordinator was to take responsibility for processing RC\_2019\_03. This Extension Notices contained some further analysis by the Rule Change Panel.

The Rule Change Panel's assessment of the current RLM had not changed since the publication of the Draft Rule Change Report but it provided some additional observations about the current RLM that were relevant to the issues raised by stakeholders regarding its draft decision.

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<sup>10</sup> The Rule Change Panel's analysis indicated that the performance of individual wind farms during system stress events ranges from between 0%-40% to between 0%-90% of Nameplate Capacity.

The Extension Notice included a summary of the Rule Change Panel's analysis of the volatility of the CRC allocations under the Delta Method, suggested options to address the volatility and made recommendations for further analysis. The Extension Notice stated that the Rule Change Panel considered that:

- some mitigation of this volatility may be necessary; and
- further analysis is needed to make a final decision on RC\_2019\_03.

The analysis in the Extension Notice indicated that, if most of the newer Intermittent Generators have historical interval meter data for a five-year reference period, most Intermittent Generators will receive less CRC under the current RLM than they would under the Delta Method.

## MAC Meetings after 1 July 2021

At the 10 August 2021 MAC meeting:

- The MAC deliberated on whether RC\_2019\_03 (and two other Rule Change Proposals) should be put on hold while the Coordinator undertakes the RCM Review.
- Ms Ryan discussed the relationship between RC\_2019\_03 and the RCM Review, and made the following key points:
  - the current RLM had deficiencies;
  - assessing RC\_2019\_03 outside of the RCM Review would be a challenge because the ERA did not design its proposed RLM for the system that is transitioning to a higher level of renewable penetration, which was the intent for the RCM Review;
  - it was preferable to not make multiple changes to the RLM; and
  - a final decision on RC\_2019\_03 was not achievable before the first quarter of 2022, so a new RLM could not be applied for the 2023 Reserve Capacity Cycle.
- The MAC noted some of the strengths and weaknesses of the ERA's proposed RLM and the Delta Method, and agreed that further consideration needs to be given to the 'interaction effect' and 'saturation effect' that the Delta Method was trying to address.
- Two MAC members – Mrs Papps and Ms White (Collgar) – expressed concerns with delaying progression of RC\_2019\_03.

At its meeting on 21 September 2021, the MAC discussed a recommendation by the MAC Secretariat to put RC\_2019\_03 (and two other Rule Change Proposals) on hold until the RCM Review is substantially complete:

- the following MAC members and observers endorsed putting RC\_2019\_03 on hold: Mr Maticka (AEMO), Mr Sharafi (AEMO), Ms Jabiri (Western Power), Mr Keay (Expert Consumer Panel), Mr Schubert (Expert Consumer Panel), Mr Gaston (Change Energy), Mr Peake (Perth Energy), Mr Kurz (Bluewaters), Mr Froad (Bright Energy), Mr Huxtable (Water Corporation) and Mr Sarawat (ERA); and
- the following MAC members and observers did not endorse putting RC\_2019\_03 on hold: Mrs Papps, Mr Edwards (Metro Energy), Ms Jo-Anne Chan (Synergy), and Ms White.

At the 2 November 2021 MAC meeting, the Chair noted that the Coordinator had decided to defer RC\_2019\_03 and that the matters raised in this Rule Change Proposal will be addressed as part of the RCM Review.

The Coordinator commenced the RCM Review in January 2022 and all information relating to this review is available on the Coordinator's website.<sup>3</sup>

The MAC established an RCM Review Working Group (RCMRWG) to support the RCM Review and the RCMRWG commenced its meetings on 1 February 2022. Detailed minutes and papers of the MAC and RCMRWG meetings are available on the Coordinator’s website.<sup>11</sup>

At its meeting on 1 March 2022, the MAC discussed the modelling methodology, assumptions and scenarios for the RCM Review, including the development of the methods to assign CRC, with the intent to design one method to assign CRC for all generation technologies.

At the 5 April 2022 MAC meeting:

- Mr Sharafi and Mrs Papps noted the importance of simplicity and transparency for any new method to assign CRC.
- EPWA indicated that different options to apply ELCC will be presented to the RCMRWG for feedback and further analysis.

At the 17 May 2022 MAC meeting, EPWA noted that the methods for assigning CRC will be assessed as part of the RCM Review and that it is in scope to look at whether capacity with different characteristics should be remunerated differently.

At the 28 June 2022 MAC meeting:

- EPWA noted that the current Availability Classes do not capture the capabilities that will be important in the future. It was proposed to replace Availability Classes with Capability Classes based on firmness of the capacity, including:
  - Class One: unrestricted firm capacity (capacity with no fuel/availability limitations, including current scheduled generators);
  - Class Two: restricted firm capacity (capacity with fuel/availability limitations, including Electric Storage Resources, Demand Side Programmes (DSPs) and Intermittent Generation with firming components); and
  - Class Three: non-firm capacity (Intermittent Generators with no firming components).
- EPWA noted that the RCMRWG supported this proposal but had sought clarification on the impact of new entrants in Class One on Capacity Credits for Facilities in Classes 2 and 3, whether Class 1 should be prioritised over Classes 2 and 3, the complexity of the proposal, and the treatment of hybrid facilities.
- EPWA noted that CRC allocation methods will continue to be controversial and that the RCMRWG was concerned with the complexity and volatility of some options. EPWA indicated that three options were being considered:
  - Option One: ELCC for Intermittent Generation only;

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<sup>11</sup> The RCMRWG consulted on the details of the RCM Review, including the RLM and allocation of CRC to Intermittent Generation. The results of the RCMRWG deliberations were reported to the MAC for review, consideration and confirmation. See footnote 5 for more information on the RCMRWG.

This Final Rule Change Report does not replicate the details of the RCMRWG’s deliberations regarding the RLM and allocation for Intermittent Generators – this information can be found in meeting papers and minutes for the RCMRWG meetings on:

- 17 February 2022;
- 2 June 2022;
- 15 December 2022; and
- 17 March 2022;
- 16 June 2022;
- 16 February 2023.
- 5 May 2022;
- 21 July 2022;

This report summarises the MAC consideration of the RCMRWG deliberations regarding the RLM and CRC allocation for Intermittent Generation.

- Option Two: a probabilistic approach for all types of capacity; and
- Option Three: a deterministic approach for intermittent facilities and DSPs based on a predetermined set of intervals.
- Mrs Papps re-presented Alinta’s volatility concerns with the Delta Method and supported considering the third option.
- Mr Sharafi indicated that AEMO supports an ELCC approach that is designed to be simple and transparent.
- EPWA encouraged stakeholders to come up with credible alternatives because time was of the essence. Mrs Papps indicated that Alinta was modelling an option and would present it to the MAC.
- The Chair noted that the MAC generally supported the direction that was being taken but that further work was to be done on several issues, including the options for CRC allocation.

At its meeting on 23 August 2022, the MAC reviewed a draft of the Stage 1 Consultation Paper. Proposal 17 from the draft of the Stage 1 Consultation Paper was that “the methodology to assign CRC to facilities in each of the different Capability Classes will differ by class”. The MAC’s comments on Proposal 17 were as follows:

- EPWA noted that the RCMRWG generally supported using different methods to assign CRC to the different Capability Classes, but it indicated that further work was needed on some issues, including Individual Reserve Capacity Requirements (IRCR).
- EPWA noted that a recommendation had not been made on CRC allocation for Capability Class 3 and that three alternatives were being considered:
  - the Delta Method;
  - a proposal from Alinta (Alinta had provided modelling results); and
  - a proposal from Collgar (Collgar had provided modelling results).
- EPWA indicated that the selected methodology must be an accurate representation of the capacity that would be available during peak intervals, and that it is difficult to design a method that represents what will be achieved in a 10% probability of exceedance (POE) event.
- Ms White suggested that the Delta Method should be eliminated because of its volatility.
- EPWA noted that, to be comparable, the options must be modelled on the same basis, using the same data, and that EPWA will replicate Alinta’s and Collgar’s modelling and publish the inputs, method and results.

The Stage 1 Consultation Paper was published on 29 August 2022 and is available on the Coordinator’s website.

### Conceptual Design Proposal 17

The methodology to assign CRC to facilities in each of the different Capability Classes will differ by class as follows:

- Class 1: Expected output at projected 10% POE peak ambient temperature;
- Class 2: Expected output at projected 10% POE peak ambient temperature, adjusted for required availability duration; and
- Class 3: To be confirmed in stage two of the RCM review.

The Stage 1 Consultation Paper presented and sought comments on three options for allocating CRC to Intermittent Generators:

- an ELCC approach: using ELCC to set the fleet CRC and the Delta Method to allocate the fleet CRC between Intermittent Generators (like the approach in the Draft Rule Change Report);
- a non-probabilistic approach: assigning CRC based on performance of the Intermittent Generators during a pre-determined set of intervals that represent system stress situations (like the current RLM); and
- a hybrid approach: using ELCC to set the fleet CRC and allocating the fleet CRC between Intermittent Facilities based on their performance during a pre-determined set of intervals (a modified version of Collgar's proposal).

At the 11 October 2022 MAC meeting:

- The MAC noted that several submissions on the Stage 1 Consultation Paper commented on the options to allocate CRC to Intermittent Generators, and in particular:
  - raised concern that the three identified methods may lead to volatility of outcomes; and
  - sought further investigation of Collgar's proposal, without amendments.
- EPWA advised that, following the closure of submissions on the Stage 1 Consultation Paper, the Coordinator met with the Australian Energy Council (AEC) and its local members. The AEC considered that the modified Collgar method would lead to unacceptable volatility from an investment point of view.
- EPWA indicated that, because of those discussions and the submissions on the Stage 1 Consultation Paper:
  - further analysis would be done on the Delta Method, the Collgar method and the modified Collgar method;
  - the key objective would be to demonstrate that the selected method does not compromise reliability; and
  - the next step would be to look at options to reduce volatility.

At the 15 November 2022 MAC meeting:

- The MAC discussed the inherent volatility of Intermittent Generators and agreed that further analysis was needed on certifying Intermittent Generators.
- EPWA noted that:
  - the volatility of the CRC outputs was caused by fleet output volatility in times of system stress;
  - fleet performance varies significantly from year-to-year and within the year in high-stress intervals; and
  - the fleet's best performance was in the year with the lowest peak demand.
- EPWA noted that the fleet was outperforming its RLM Capacity Credits in most years, which highlights that the current RLM is too conservative and creates an incentive to install more capacity than is needed.
- EPWA noted that it is looking for a CRC allocation method that reflects Facility performance in system stress intervals so that consumers are not forced to pay for capacity that is unavailable when it is needed.
- EPWA noted that:

- To protect system reliability, any option to minimise year-to-year volatility of CRC allocations for Intermittent Facilities, to provide certainty for investors, would need to smooth the volatility in a way that reduces the number of allocated Capacity Credits for a particular year rather than increasing them;
- Both the Hybrid Method and the Delta Method calculate a fleet CRC using ELCC and then different methods to divide the fleet CRC between Intermittent Generators; and
- One approach to avoid being overly generous when smoothing the CRC allocations to Intermittent Generators is to make the fleet CRC for the evaluation period a ceiling for the CRC that is allocated in any year.

At the 2 February 2023 MAC meeting:

- EPWA presented analysis that clearly showed that the volatility of CRC allocations is a result of the inherent volatility of Intermittent Generation.
- EPWA indicated that there are several ways to smooth year-to-year volatility in the fleet CRC that could improve certainty for investors. However, any method to reduce volatility must not give too much weight to Intermittent Generator performance in low stress periods, which would overinflate the fleet ELCC, reduce system reliability and increase costs to consumers.
- EPWA presented an approach to smooth the fleet ELCC that had been generally endorsed by the RCMRWG:
  - volatility due to unusually high performance in a single year can be mitigated by setting the fleet CRC to the lower of:
    - the fleet ELCC calculated for the whole period; or
    - the average of the fleet ELCCs calculated for each individual year of the period; and
  - the effect of low stress periods can be mitigated by removing the year with the lowest peak from the data used to calculate the fleet ELCC.
- EPWA indicated that:
  - it had proposed to the RCMRWG to calculate the fleet CRC using ELCC with the smoothing approaches indicated above and allocating the fleet CRC between Facilities using the Delta Method;
  - several RCMRWG members expressed a strong desire for a simpler method to allocate the fleet CRC between Facilities, based on Facility performance in specific intervals, so that investors could understand and apply the method themselves; and
  - EPWA responded by proposing to allocate the fleet CRC between Facilities based on their performance during the IRCR intervals, which are selected to represent system stress events.<sup>12</sup>
- EPWA noted there is no method to allocate CRC to Intermittent Facilities that will satisfy everyone, and that the method to calculate the fleet CRC cannot compromise the reliability requirements, but that the distribution of that fleet CRC across individual Facilities is a matter of finding a balanced approach.

<sup>12</sup> See section 2 and Outcome 1 from the Stage 2 Information Paper for more information on the revised method to set the IRCR intervals ([reserve capacity mechanism review - information paper stage 2.pdf \(www.wa.gov.au\)](https://www.wa.gov.au/government/publications/reserve-capacity-mechanism-review-information-paper-stage-2)).

- The Chair asked for modelling results for the proposed IRCR allocation approach to be presented to the MAC and indicated that the MAC would need to form a principle-based view on this method rather than a view based on commercial outcomes for individual generators.
- The MAC endorsed the RCMRWG's conclusions on the proposed method to determine the fleet CRC and agreed to consider the IRCR allocation method once modelling results were available.

At the 16 March 2023 MAC meeting:

- EPWA presented the analysis of the proposed IRCR method to allocate the fleet CRC to Intermittent Generators and indicated that the proposed method:
  - provides no obvious distortions;
  - is less volatile than the Delta Method; and
  - results in year-to-year changes that are influenced by both the fleet ELCC and Facility performance.
- The MAC members endorsed the proposed IRCR method for assigning CRC to Intermittent Generators.

### **4.3 The Rule Change Panel's and Coordinator's Response to the Market Advisory Committee**

Section 5.3, section 6 and Appendix A of the Draft Rule Change Report provides the Rule Change Panel's response to the MAC's advice that was provided prior to publication of the Draft Rule Change Report.

The MAC did not provide specific advice to the Coordinator regarding RC\_2019\_03 after publication of the Draft Rule Change Report but provided significant advice relevant to the Rule Change Proposal as part of the RCM Review. The Coordinator's response of the MAC's advice is presented in the Stage 1 Consultation Paper, the Stage 1 Information Paper and the Stage 2 Information Paper.

### **4.4 Submissions Received during the First Submission Period**

The first submission period for this Rule Change Proposal was between 18 December 2020 and 11 February 2021. The Rule Change Panel received submissions from:

- AEMO;
- Collgar Wind Farm; and
- Alinta;
- Synergy.

One submission was received out of session, from the AEC.

A summary of these submissions is provided in section 5 of the Draft Rule Change Report.

### **4.5 The Rule Change Panel's Response to Submissions Received during the First Submission Period**

The Rule Change Panel's assessment of the issues raised in the first period submissions is presented in sections section 6.1 and 6.2 of the Draft Rule Change Report.

## 4.6 Submissions Received during the Second Submission Period

The second submission period for this Rule Change Proposal was between 20 April 2021 and 19 May 2021. The Rule Change Panel received submissions from:

- AEMO;
- Alinta;
- Collgar Wind Farm;
- the ERA;
- Infrastructure Capital Group (ICG);
- Merredin Energy;
- Metro Power;
- Perth Energy; and
- Synergy.

One submission was received out of session, from the AEC.

AEMO supported the intent of the Draft Rule Change Report and agreed with the proposed framework to assess the ELCC for the fleet of Intermittent Generators.

AEMO encouraged the Rule Change Panel to explore solutions to mitigate the potential volatility in the ELCC of individual Facilities, as this would yield a more stable locational price signal for the investment in Intermittent Generators. AEMO suggested that the Delta Method could be used to allocate the fleet ELCC between Facility groups based on technology and location.<sup>13</sup>

AEMO noted that the rate of installation of behind-the-meter Electric Storage Resources (ESR) in the SWIS is accelerating and that this growth is expected to be exponential in the next five years. AEMO noted that uptake of behind-the-meter ESR is likely to change the SWIS demand profile and encouraged the Rule Change Panel to include provisions in the WEM Rules to amend the RLM if the uptake of behind-the-meter ESR has a major impact on future demand profiles.

Alinta objected to the draft decision to modify the ERA's Rule Change Proposal. Alinta considered that the changes made in the draft decision would significantly limit the sample size for calculating both the fleet ELCC and the ELCC for individual generators, distorting both the fleet and individual generators' capacity values. Alinta:

- objected to the Delta Method, and recommended that the Rule Change Panel adopt ERA's method to allocate the fleet ELCC to individual generators; and
- recommended that the Rule Change Panel determine the fleet ELCC as the median of the annual fleet ELCC results.

Collgar agreed that there are deficiencies in the existing RLM and supported the proposed Delta Method because it would send appropriate investment signals about the location of new facilities to support generation diversity across the network.

The ERA expressed concern that allocating Capacity Credits using the proposed Delta Method would not improve estimation of individual Facility's contribution to system reliability and suggested:

- allocating CRC to individual Facilities based on the average available capacity of Facilities during system reliability stress periods, after allocating the fleet ELCC to Facility groups based on their overall availability profile; or
- that the Delta Method could be applied to allocate the fleet ELCC to technology groups.<sup>14</sup>

<sup>13</sup> The Rule Change Panel assessed this alternative for the 2014-2021 Reference Period and the modelling results for this alternative, in comparison to the Delta Method, are summarised in the 30 June 2021 Extension Notice.

<sup>14</sup> The Rule Change Panel noted in its 30 June 2021 Extension Notice that an important source of the fleet interaction effect is the diversity within the wind technology group, and that it did not agree with any approach that groups wind farms without accounting for locational differences.

The ERA considered that the draft decision to scale CRC values in the Capacity Outage Probability Table (COPT) used in the RLM calculation is inconsistent with the WEM Rules.

The ERA noted that all Intermittent Generators contribute to system reliability and that it may be discriminatory to use different capacity valuation methods for Intermittent Generators, which may be inconsistent with the Wholesale Market Objectives.

The ICG accepted that changes are needed to address shortcomings in the existing RLM and supported the ERA's proposal. However, the ICG submitted that uncertainty remains regarding the Delta Method and considered that further evidence is needed to ensure that it will result in outcomes that are in the best interests of the market.

Merredin Energy requested that the Rule Change Panel consider the implications of its proposed changes to the RLM for existing generators and asked the Rule Change Panel to confirm that proposed changes account for the NAQ framework and the Capacity Uplift mechanism. If not, the Merredin Energy asked the Rule Change Panel to make recommendations on what changes to the WEM Rules and to transitional mechanisms could be made to ensure that dispatchable generation is not disadvantaged by changes to the RLM in a constrained network.

Metro Power strongly supported the Draft Rule Change Report.

Perth Energy was concerned that the Delta Method assigned similar Capacity Credits to two wind farms with substantially different capacities. Perth Energy considered that a methodology that produces such results would lead to perverse market outcomes. Perth Energy considered that:

- EPWA should develop a loss of load hours target, with appropriate consultation; and
- modelling should be undertaken to determine the capacity value of Intermittent Generators with the forecast demand set at the 1 in 10 year level in each future year.

Synergy did not support retention of the current RLM and agreed with some of the principles underlying the changes in the Draft Rule Change Report. However, it considered that the changes are likely to give rise to critical issues that may adversely impact the Wholesale Market Objectives if they are not adequately addressed in a timely manner.

Synergy recommended adopting the Delta Method for the 2021 Reserve Capacity Cycle, as drafted in the Draft Rule Change Report, but that a clause should be inserted into the WEM Rules to mandate a review of the allocations to individual Facilities to reduce volatility, for implementation before the 2022 Reserve Capacity Cycle.

Synergy indicated that it had not identified any fundamental issues with the Delta Method but noted that any outcome that is driven by three Trading Intervals is sub-optimal. Synergy suggested introducing a clause to allow AEMO to scale historical system demand, at its discretion.

Synergy did not recommend the implementation of the Rule Change Proposal as drafted and noted its preference for the Delta Method, so long as the volatility issue is addressed. Synergy noted that, irrespective of the option chosen, the adopted mechanism should be refined in the subsequent years when the tight timeframe is not a concern.

Synergy and AEMO raised concerns that the system demand profiles used in the RLM may need to be adjusted to not only account for the impact of behind-the-meter solar PV, but also for other forms of Distributed Energy Resources (DER), including the operation of ESR and electric

vehicles.<sup>15</sup>

The AEC indicated that its members have diverse views on the Delta Method and that some have raised specific concerns, including:

- the limited sample size for calculating the ELCC for individual generators;
- the volatility in CRC allocations that is likely to result from relying on a limited sample size;
- the potential for the contribution of Intermittent Generators to be incorrectly valued due to the small data set and volatility, at a time when most new entry is expected to be by Intermittent Generators; and
- the adverse impacts on the Wholesale Market Objectives.

The AEC encouraged the Rule Change Panel to adopt an approach that maximises the number of intervals used to allocate the ELCC for individual generators and encouraged further stakeholder engagement to review the allocation of the fleet ELCC to individual generators to reduce volatility and the flow-on impacts.

### Responses to Questions in the Draft Rule Change Report

The Rule Change Panel sought stakeholder views on the following specific issues in the Draft Rule Change Report:

- (1) What is the latest acceptable time for the publication of CRC and Capacity Credit assignments, and why?
- (2) Is the proposed 10 MW nameplate capacity threshold appropriate for grouping small Facilities for the allocation of the Fleet ELCC, as outlined in section 6.1.8 of the Draft Rule Change Report, and if not, why and what alternative do you suggest?
- (3) Is it appropriate to allow AEMO to include any small Facilities with a nameplate capacity above a selected threshold in the small Facility groups for the purpose of allocating the fleet ELCC, if AEMO considers that the Facility may otherwise not be assessed appropriately due to rounding issues?
- (4) Do stakeholders have any concerns about the proposed requirement for AEMO to publish the historical output for all Candidate Facilities, including relevant estimates from AEMO and the estimated output from independent expert reports for Trading Intervals before a Facility's full operational date, and if so, what are the concerns?

In response to Question (1):

- AEMO estimated that it would need seven to nine Business Days to assess CRC using the Delta Method and potentially more time due to the additional steps associated with proposed Facilities and the calculation of multiple COPTs. AEMO proposed extending the time for notification of CRC assignments and subsequent events by 12 days so that the Capacity Credit and NAQ assignments would be published on the same day – the last Business Day on or before 12 October of Year 1 of the Reserve Capacity Cycle.<sup>16</sup>
- Synergy supported adjustments to the timelines for the publication of the CRC and Capacity

<sup>15</sup> The Rule Change Panel noted in the 30 June 2021 Extension Notice that it agreed with Synergy's and AEMO's concerns and recommended that the Coordinator consider additional changes to allow AEMO to adjust the system demand profile used in the RLM to reflect the impacts of BESS and electric vehicle penetration in the SWIS.

<sup>16</sup> The Rule Change Panel indicated in the 30 June 2021 Extension Notice that it agreed that AEMO is likely to require additional time to complete the new RLM calculations and recommended that the Coordinator extend the timeframe.

Credit assignments to allow for the proposed RLM process to occur. However, Synergy noted that the total number of assigned Capacity Credits are required in the determination of the Reserve Capacity Price, so any delays should be kept to a minimum. In subsequent discussions with the Rule Change Panel, Synergy confirmed that it had no concerns with a 12-day extension of the relevant deadlines.

In response to Question (2):

- AEMO raised concerns about the proposed method of grouping of Non-Scheduled Facilities to allocate the fleet ELCC using the Delta Method.<sup>17</sup> AEMO indicated that it is important to consider whether using a threshold of 10 MW to group small Facilities results in an inequitable allocation of the group ELCC to individual small Facilities within the group and encouraged the Rule Change Panel to carry out further analysis to confirm whether:
  - variability among individual small Candidate Facilities in the non-biogas group would materially impact on the allocation of the group ELCC to the individual small Facilities; and
  - it is feasible to group small Candidate Facilities using a smaller threshold while considering their geographical locations.
- Synergy supported the 10MW nameplate capacity threshold proposed for the grouping of small Facilities for the allocation of the fleet ELCC.

In response to Question (3), AEMO considered that scenario analysis is required to understand the potential impact of including any small Facilities in the small Facility groups when allocating the fleet ELCC. AEMO encouraged the Rule Change Panel to provide a calculation example to illustrate the rounding issues that might occur using the amended RLM. AEMO suggested specifying a set of criteria in the WEM Rules or a WEM Procedure to guide AEMO on when to make such inclusions, thus providing clarity and transparency in this process.

In response to question (4), Synergy and the AEC disagreed with publication of the historical output for all Candidate Facilities, including relevant estimates from AEMO and the estimated output from independent expert reports for Trading Intervals before a Facility's full operational date.<sup>18</sup>

## Stakeholder Assessments against the Wholesale Market Objectives

The assessments by the submitting parties as to whether the WEM Rules, as amended by the WEM Amending Rules in the Draft Rule Change Report, would better achieve the Wholesale Market Objectives is summarised in Table 1.

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<sup>17</sup> The Rule Change Panel recommended in the 30 June 2021 Extension Notice that the Coordinator undertake further analysis to assess the impact of potential rounding issues on Non-Scheduled Facilities and whether a better mechanism exists to address rounding issues. The Rule Change Panel considered that the potential rounding issues are also likely to apply to facility upgrades with a nameplate capacity less than 10 MW and recommended that the Coordinator consider options to address this concern.

<sup>18</sup> The Rule Change Panel recognised this concern in its 30 June 2021 Extension Notice but was not convinced that they outweigh the efficiency and transparency benefits of making the information available to all stakeholders. The Rule Change Panel recommended that the Coordinator consider restricting the publication of Historical Output values to facilities that are assigned Capacity Credits for the current Reserve Capacity Cycle or Early CRC for a future Reserve Capacity Cycle.

**Table 1: Comments on the Wholesale Market Objectives from the Second Period Submissions**

Submitter	Wholesale Market Objectives Assessment
AEC	The AEC did not comment on the Wholesale Market Objectives.
AEMO	AEMO considered that improving the method to allocate the fleet ELCC to individual Intermittent Generators will better facilitate achievement of Wholesale Market Objectives (a), (b), (c), and (d).
Alinta	Alinta considers that the proposed Delta Method would not result in achieving Wholesale Market Objectives (a), (b), (c), and (d).
Collgar	Collgar considered the Delta Method better meets the Wholesale Market Objectives compared to the ERA's proposed method. The Delta Method promotes economically efficient market entry and electricity generation by providing clear price signals for investment in diverse generation technologies across the network. This will improve reliability by minimising concentration of generators in a single location and decreasing costs (including Essential System Services costs and Uplift Payments, and potential network augmentations). Improved reliability and lower generation costs are in the long-term interest of customers.
ERA	The ERA did not consider that the introduction of the Delta Method to assign the fleet capacity value to individual Intermittent Generators and the proposed adjustments to the COPT will improve how the WEM meets Wholesale Market Objectives (a), (b) and (c). The ERA considered, instead, that its proposed changes to the RLM will increase the economic efficiency and reliability of the SWIS.
ICG	The ICG considered that the RLM proposed by the ERA in its initial Rule Change Proposal, would better meet Wholesale Market Objectives (a) and (d) and would be consistent with (b) and (c). ICG noted that the Rule Change Panel had assessed that the Delta Method is consistent with the Wholesale Market Objectives but had not presented an assessment of the ERA's initial proposal. ICG considered the Delta Method to be inconsistent with Wholesale Market Objectives.
Merredin Energy	Merredin Energy did not comment on the Wholesale Market Objectives.
Metro Power	Metro Power considered that the Delta Method would better facilitate achievement of Wholesale Market Objectives (a), (b), (c) and (d).
Perth Energy	Perth Energy expressed concerns that a methodology that produces unusual outcomes will harm the market more than an understood but poor methodology. Perth Energy had a strong preference for a process that is transparent and allows market participants and prospective developers to estimate their Capacity Credits.
Synergy	Synergy considered that the Delta Method is driven by the average performance of Intermittent Generators over a limited number of independent

Submitter	Wholesale Market Objectives Assessment
	<p>Trading Intervals, so it was likely to produce volatile outcomes that will not better achieve the Wholesale Market Objectives:</p> <ul style="list-style-type: none"> <li>(a) economic efficiency: benefits from more accurately accrediting Intermittent Generators based on their contribution to system adequacy during high system stress intervals are likely to be outweighed by the potential extreme variations in future CRC allocations, which are unlikely to provide a reliable estimate of the average output of Facilities during system stress periods;</li> <li>(b) encourage competition: increased uncertainty arising from unstable outcomes is likely to distort investment signals, deterring investment in Intermittent Generators; and</li> <li>(c) minimise the long-term cost of electricity: reduction in Intermittent Generation investment may place upward pressure on long-term costs of electricity.</li> </ul> <p>Synergy considered it essential for the Rule Change Panel to incorporate practical amendments to the WEM Amending Rules to expand the set of intervals used to allocate the fleet ELCC to individual Facilities to mitigate the above issues.</p>

Copies of all submissions received during the second submission period are available in full on the Coordinator’s website.

## 4.7 The Coordinator’s Response to the Submissions Received during the Second Submission Period

The Coordinator’s overall assessment of the issues raised in the second period submissions is presented in section 6 of this report.

The MAC provided advice relevant to the Rule Change Proposal RC\_2019\_03 throughout the RCM Review. The MAC also established the RCMRWG to support the RCM Review. Detailed minutes and papers of the MAC and RCMRWG meetings are available on the Coordinator’s website.

## 4.8 Advice on the WEM Technical Standards

The Coordinator considered that RC\_2019\_03 would not directly or indirectly affect the WEM Technical Standards and therefore did not seek advice from AEMO or a Network Operator.

## 4.9 Public Forums and Workshops

The MAC held two workshops on this Rule Change Proposal –see section 4.2 of this report.

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## 5. The Rule Change Panel's Draft Decision

The Rule Change Panel's draft analysis of the Rule Change Proposal and its draft assessment of the proposal against clauses 2.4.2 and 2.4.3 of the WEM Rules is presented in section 6 of the Draft Rule Change Report, which is available on the Coordinator's website.

The Rule Change Panel's draft decision was to accept the Rule Change Proposal in a modified form. The reasons for the Rule Change Panel's draft decision are set out in section 2.1 of the Draft Rule Change Report.

The draft WEM Amending Rules are set out in section 7 of the Draft Rule Change Report.

## 6. The Coordinator's Final Assessment

In preparing its Final Rule Change Report, the Coordinator must assess the Rule Change Proposal considering clauses 2.4.2 and 2.4.3.

Clause 2.4.2 states:

The Coordinator must not make WEM Amending Rules unless it is satisfied that the WEM Rules, as proposed to be amended or replaced, are consistent with the Wholesale Market Objectives.

Clause 2.4.3 sets out the matters that the Coordinator must have regard to in deciding whether to make WEM Amending Rules, including:

- (a) any applicable statement of policy principles given to the Coordinator under clause 2.5.2;
- (aA) any advice provided by the MAC regarding the evolution or the development of the WEM or these WEM Rules;
- (b) the practicality and cost of implementing the Rule Change Proposal;
- (c) the views expressed in any submissions on the Rule Change Proposal;
- (d) any advice by the MAC where the MAC met to consider the Rule Change Proposal;
- (dA) whether the advice from the MAC provided under clause 2.4.3(d) reflects a consensus view or a majority view, and, if the latter, any dissenting views included in or accompanying the advice and how these views have been considered by the Coordinator;
- (e) any technical studies that the Coordinator considers are necessary to assist in assessing the Rule Change Proposal; and
- (f) any advice or information provided by AEMO or a Network Operator under clause 2.4.3C.

When making its final decision, the Coordinator has had regard to each of the matters identified in clauses 2.4.2 and 2.4.3, as follows:

- the Coordinator's overall assessment of the Rule Change Proposal is presented in section 6.1;
- the Coordinator's assessment of the Rule Change Proposal against the Wholesale Market Objectives can be found in section 6.3;
- the Minister has not provided a statement of policy principles to the Coordinator in respect of this Rule Change Proposal;
- the Coordinator's assessment of the practicality and cost of implementing the Rule Change Proposal can be found in section 6.7;
- a summary of the views expressed by the MAC is in section 4.2 of this Final Rule Change Report and section 5.2 of the Draft Rule Change Report;
- the Coordinator's responses to the views of the MAC are provided in sections 4.3 and 6.1 of this Final Rule Change Report;
- the Rule Change Panel's responses to the views of the MAC are provided in section 5.4, and Appendix A of the Draft Rule Change Report;
- a summary of the first period submissions is provided in section 4.4 of this Final Rule Change Report and section 5.4 of the Draft Rule Change Report;

- the Rule Change Panel’s responses to the first period submissions are provided in section 4.5 and 6.1 of this Final Rule Change Report, and in section 5.4, sections 6.1 and 6.2 and Appendix A of the Draft Rule Change Report;
- a summary of the second period submissions is provided in section 4.6 of this Final Rule Change Report;
- the Coordinator’s responses to the second period submissions are provided in section 4.7 of this Final Rule Change Report;
- the Coordinator does not consider that a technical study in respect of this Rule Change Proposal is required and therefore has not commissioned one; and
- the Coordinator does not consider that the WEM Amending Rules will directly or indirectly affect a WEM Technical Standard and therefore did not seek advice from AEMO or Western Power on the WEM Technical Standards.

## 6.1 Assessment of the Proposed Changes

### 6.1.1 Deficiency of the Current RLM

The SWIS is undergoing a major transition, and the nature of the SWIS demand profile and supply sources are changing. This transition to a low emissions energy system is characterised by increasing levels of intermittent and distributed generation. As a result, improved market design elements are needed to ensure secure and reliable electricity supply. While these new elements bring increased costs in some cases, analysis suggests they are necessary to avoid significant and ongoing reductions in the reliability of electricity supply.

The method for assigning CRC to Intermittent Generators has changed several times, with the most significant change applied from the 2014 Capacity Year (the 2012 Reserve Capacity Cycle). This change replaced the determination of CRC for Intermittent Generators based on average performance with the current RLM that aims to account for performance during peak demand, variability, and saturation.

The Coordinator has considered the ERA’s Final Report on the RLM Review, submissions received in the first and second submission periods, and consulted with the RCMRWG and the MAC. The Coordinator agrees that the current RLM is inappropriate for measuring the contribution of Intermittent Generators to system reliability in the SWIS and should be replaced.

### 6.1.2 CRC Assignment

A Facility’s expected contribution to system reliability is recognised by the level of CRC it is allocated. In the current WEM Rules, different technologies are assessed in different ways:

- non-Intermittent Generators are assessed based on their expected availability at 41°C;
- ESR facilities are assessed based on their maximum output over a set duration (currently four hours);
- DSPs are assessed based on their historical load during high demand periods; and
- Intermittent Facilities are assessed based on their historical output in intervals with high non-intermittent generation, according to the RLM specified in Appendix 9 of the WEM Rules.

The current RLM was designed for an environment where intermittent generation made up a small proportion of the fleet. It uses constant parameters in the calculation (the K and U factors), the purpose and calculation of which is not defined under the WEM Rules. Market Participants and

new entrants into the SWIS cannot calculate the value of these parameters. The current RLM is inconsistent with the Planning Criterion because it focuses on performance in periods that do not directly relate to system stress. Increased penetration of Intermittent Generators in the system will exacerbate the issues with the current RLM.

As the number of Intermittent Generators in the SWIS continues to grow, it will become increasingly important to ensure that the CRC values of Intermittent Generators accurately reflect their actual contribution to system reliability and signal the value of firming of the output of Intermittent Generators. Ideally, a CRC allocation method for Intermittent Generators would:

- accurately reflect Facility performance in periods of system stress;
- account for the correlation of output between Facilities in the same location or affected by the same weather conditions;
- ensure those who are best placed to manage the risk of volatility in Intermittent Generator output are exposed to that risk; and
- minimise CRC volatility between years to provide certainty for investment.

Selection of an appropriate method for CRC allocation for intermittent facilities was concluded during Stage 2 of the RCM Review.

### 6.1.3 The Approach to Capacity Certification

Western Australia experiences extreme system stress events very infrequently, and not all years have the same level of stress. For example, 2016 had 47 hours with higher demand than the 2017 peak. Each year has a very small number of intervals with very high load, and in some years the load reaches a considerably higher level than in others. Weather drives both demand and intermittent generation, so performance in historic stress intervals is the only viable measure of expected performance in future stress intervals.

As seen in the review of International Capacity Mechanisms<sup>19</sup> published alongside the Stage 1 Consultation Paper, the contribution of intermittent facilities is sometimes assessed through probabilistic methods, including ELCC, equivalent firm capacity (EFC), and the marginal reliability index (MRI).

Under these approaches, intermittent facility CRC is based on actual contribution to system reliability, accounting for expected facility output at times of system stress.

An approach to assign CRC to Intermittent Generation was designed under the RCM Review. The selected method reflects Facilities' actual contribution to system reliability, balanced with the need to provide certainty for investment. Design and assessment of the revised RLM was conducted in consultation with the MAC and the RCMRWG. EPWA endeavoured to align input data, calculation models, and outputs across the alternative methods examined as far as practical.

The Coordinator considered, as part of the RCM Review, that the IRCR methodology also required adjustment – see section 3.2 of the Stage 1 Information Paper and section 2.1.1 of the Stage 2 Information Paper.

The Stage 1 Consultation Paper considered the various aspects of capacity certification, and proposed removing the current Availability Classes from the WEM Rules and replacing them with different Capability Classes and using different methodologies to assign CRC to facilities in each of the Capability Classes. It considered that a simple method of CRC assessment remains

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<sup>19</sup> [Microsoft Word - RC Review - Literature Review Report v1.0 \(www.wa.gov.au\)](http://www.wa.gov.au)

appropriate for Capability Class 1 and 2 Facilities, but that an alternative method is preferred for Capability Class 3 Facilities.

EPWA undertook substantial analysis and developed a method for assigning CRC to the various types of Facilities, in consultation with the RCMRWG and the MAC. The approved method is described in Review Outcome 8 from the Stage 1 Information Paper.

### Review Outcome 8

The current Availability Classes will be replaced with new Capability Classes:

- Class 1: Unrestricted firm capacity;<sup>20</sup>
- Class 2: Restricted firm capacity;<sup>21</sup> and
- Class 3: Non-firm capacity.<sup>22</sup>

Hybrid facilities will be assessed as a single entity.

Facilities holding Capacity Credits in Capability Classes 1 and 2 will continue to have obligations to offer into the STEM and Real-Time Markets, undergo capacity testing, and pay refunds when not meeting their obligations.

### Rationale

Most submissions to the Stage 1 Consultation Paper supported the new Capability Classes.

The reason for three Capability Classes is to recognise that facilities with firm availability provide a greater contribution to system reliability than those with lower availability. Participants who wish to procure shorter duration fuel contracts can seek certification in Capability Class 2 and receive a pro-rated CRC accordingly, with fuel availability obligations in fewer hours than are faced by facilities in Capability Class 1. This will enable the participants to reduce their fuel contract costs.

#### 6.1.4 Capacity Certification for Capability Class 3

The output of Intermittent Generators is inherently uncertain, varying from interval-to-interval and from year-to-year. No CRC allocation method will perfectly predict the output of an intermittent facility in a future period of system stress, based on historical output data. CRC allocation will always be an estimate of the expected contribution.

The objectives for the method to allocate CRC to Intermittent Generators were to:

- ensure that the system reliability objective is met;
- adequately assess Facilities' contribution to system reliability;
- minimises year-to-year volatility of CRC for investors; and
- be simple and transparent.

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<sup>20</sup> A Capability Class 1 facility must be firm, dispatchable capacity with no fuel supply or availability limitations such that, if dispatched, it could run at maximum output for at least 14 hours.

<sup>21</sup> A Capability Class 2 facility must be firm, dispatchable capacity that is not eligible for Capability Class 1 due to fuel supply or availability limitations. This might include a storage facility that is energy limited, a DSP that is only available at certain times of day or a dispatchable facility that has restrictions on fuel supply.

<sup>22</sup> A Capability Class 3 facility is one which does not provide firm, dispatchable capacity, such as a wind or solar farm without collocated firming capacity. Capability Class 3 facilities would not have availability obligations (as is currently the case for Semi-Scheduled Facilities) but would expect to have a significantly lower ratio of CRC to nameplate capacity than facilities in the other Capability Classes.

All stakeholders supported amending the current RLM but differed in their views on a suitable replacement. The approach to determining CRC for Intermittent Facilities can be separated into two steps:

- (1) determining the total CRC to be allocated to the fleet; and
- (2) allocating the fleet CRC across all facilities.

### Setting the Fleet CRC

The Stage 1 Consultation Paper identified two methods that use ELCC to set the fleet CRC and one that assessed each facility individually without considering the overall contribution of the fleet. Submissions and subsequent discussions at the RCMRWG and the MAC concluded that an approach that considered the overall fleet contribution is appropriate.

Respondents also indicated a strong desire to mitigate year-to-year volatility in CRC outcomes to improve certainty for investors. One respondent considered that the method for assigning CRC to Intermittent Generators should reflect their contribution to system reliability and provide strong incentives to firm intermittent capacity.

EPWA's primary concern was that any method to reduce year-on-year CRC volatility should not cause CRC allocations that overstate the performance of Intermittent Generators by increasing the weight placed on performance in lower stress periods. As a result, the proposed fleet ELCC process was to include measures to reduce year-to-year volatility while maintaining focus on high stress periods.

It was determined that volatility due to unusually high performance in a single year can be mitigated by setting the fleet ELCC to the lower of:

- the fleet ELCC calculated for the whole reference period; and
- the average of the fleet ELCCs calculated for each individual year of the reference period.

Some years do not have any significant stress periods. The effect of low stress periods can be mitigated by removing the year with the lowest peak from the data used to calculate ELCC. For example, 2018 has the lowest peak demand of any year in the 2015 to 2021 period, approximately 300 MW lower than any other year, and 750 MW lower than the highest peak interval.

EPWA has used an Expected Unserved Energy (EUE) approach to calculate the fleet ELCC,<sup>23</sup> using the target from the second limb of the Planning Criterion. This approach is less reliant on firm facilities than a COPT, so it is more suitable for systems with high proportion of intermittent penetration.

### Allocating the Fleet CRC to Individual Facilities

Most submissions indicated a preference to allocate the fleet ELCC based on performance during system peak intervals. Four respondents considered that existing facilities should be protected from new facilities eroding their CRC.

EPWA analysed four options for CRC allocation to Intermittent Generators during Stage 2 of the RCM Review:

- the Delta Method, in which first-in and last-in Facility ELCCs are calculated and used to distribute the fleet CRC;

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<sup>23</sup> See [Reserve Capacity Mechanism review \(www.wa.gov.au\)](http://www.wa.gov.au) Stage 1 RCM Review Consultation Paper for more detail on the ELCC method.

- the EPWA Hybrid Method, in which the fleet CRC is distributed based on Facility performance in stress intervals, using Load for Scheduled Generation (LSG) to determine which intervals to consider;
- the Collgar Hybrid Method, in which the fleet CRC is distributed based on Facility performance in stress intervals, using total demand to determine which intervals to consider; and
- the IRCR Method, in which the fleet CRC is distributed based on Facility performance during the IRCR intervals.

Analysis for the four methods is captured in RCMRWG papers, which are available on the Coordinator's website.<sup>24</sup> The Coordinator, in consultation with the MAC and the RCMRWG, has determined to use the simpler IRCR method. This makes it easier for participants and investors to apply the method themselves and aligns incentives for capacity suppliers and consumers.

The approved method is to set the fleet CRC using ELCC and to allocate the fleet CRC to Intermittent Generators based on their performance in the IRCR intervals. This is explained in section 2.4.3 of the Stage 1 Information Paper and is set out in Review Outcome 11.

### Review Outcome 11

The fleet CRC is to be set as follows:

- (1) Take historical load for the most recent 5 Capacity Years, and adjust it to account for:
  - (a) output profiles of current levels of DER; and
  - (b) DSP dispatch, unserved energy and use of Supplementary Reserve Capacity and Non-Co-Optimised Essential System Services.
- (2) Take historical generation output for each Capability Class 3 facility for the same period and adjust it to remove the effects of any involuntary curtailment (whether this is economic curtailment by the clearing engine, network constraints, or AEMO direction).
- (3) Remove data from the Capacity Year with the lowest peak demand.
- (4) For the whole remaining dataset, and for each individual year in the remaining dataset, calculate the initial Fleet ELCC as follows:
  - (a) increase or decrease demand by adding or subtracting the same MWh quantity in each interval to the point at which expected EUE is at the level specified in the Planning Criterion, assuming that:
    - (i) Capability Class 1 and 2 facilities have no planned outages;
    - (ii) Capability Class 1 and 2 facilities suffer forced outages at historic rates;
    - (iii) there are no network constraints;
  - (b) remove all Capability Class 3 facilities from the generation fleet;
  - (c) reduce load until the EUE is the same MWh quantity as it was in step (4)(a); and
  - (d) set the fleet ELCC to the quantity of load reduced in each interval, converted to MW.

<sup>24</sup> Collgar and Alinta presented proposed methods to allocate the fleet CRC to Intermittent Generators to the RCMRWG on 21 July 2022.

EPWA presented analysis of the options to allocate CRC to Intermittent Generators and to mitigate volatility of outcomes of the methods to the RCMRWG on 15 December 2022; and EPWA presented analysis of the impact of the IRCR Method to the RCMRWG on 16 February 2023.

- (5) Set the fleet CRC as the lower of:
  - (a) the fleet ELCC for the whole dataset; and
  - (b) the average of the fleet ELCCs for each individual year.

The fleet CRC will be allocated to individual facilities as follows:

- (1) Take historical output for each Capability Class 3 facility for the previous five Capacity Years and adjust to remove the effects of any involuntary curtailment (whether due to offer prices, network constraints, or AEMO direction).
- (2) Remove data from the Capacity Year with the lowest system peak demand.
- (3) use the approved method identify the Peak IRCR intervals for each year of the remaining dataset.<sup>25</sup>
- (4) For each Capability Class 3 facility:
  - (a) find the mean historical output in the intervals selected in step 3;
  - (b) set the facility proportion equal to the quantity determined for the facility in step (4)(a) divided by the sum over all Capability Class 3 facilities of the quantities determined in step (4)(a).
  - (c) Set the facility CRC equal to the fleet CRC multiplied by the facility proportion determined in step (4)(b).

Appendix B in the Stage 1 Information Paper provides analysis on the impact of this approach to set the fleet CRC and to allocate the fleet CRC on the current Capability Class 3 Facilities.

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<sup>25</sup> The approved method to determine the Peak IRCR is set out in Review Outcome 1 from the Stage 2 Information Paper, as follows:

Peak IRCR intervals will be selected as follows:

- (1) identify the 12 intervals from the previous Hot Season (December-March) with the highest total sent out generation (SOG);
- (2) identify the trading days on which those intervals fell;
- (3) if fewer than three days are identified in step (2), identify the additional days in the Hot Season with the highest SOG outside the top 12 intervals to make a total of three days, rather than one or two days;
- (4) for each identified day, select:
  - (a) the interval with the highest SOG;
  - (b) all other intervals that are in the top 12 intervals;
  - (c) if the intervals selected in steps (4)(a) and (4)(b) are less than three hours apart, all intervals between the intervals selected in steps (4)(a) and (4)(b); and
  - (d) if fewer than three intervals have been selected, select the next highest SOG intervals on either side of the selected intervals to make up to three intervals.

Temperature Dependant Load and Non-Temperature Dependent Load multipliers will be removed from the IRCR process.

Participant Peak IRCR will be calculated on a daily basis.

The representative load for new meters will be calculated as the maximum of the median demand in the four peak intervals of any prior calendar month.

## 6.2 Additional Amendments to the Proposed WEM Amending Rules

The Rule Change Panel made some changes to the proposed WEM Amending Rules following the first submission period. A summary of these changes was provided in section 6.2 of the Draft Rule Change Report and were shown in detail in Appendix C of the Draft Rule Change Report.

WEM Amending Rules were drafted in Stage 3 of the RCM Review to reflect the Review Outcomes from Stages 1 and 2. These Amending Rules will be implemented instead of the proposed WEM Amending Rules from the Draft Rule Change Report.

The draft WEM Amending Rules were published for consultation on 14 September 2023 and submissions on the draft WEM Amending Rules are due by 5:00 PM (AWST) on 19 October 2023.<sup>26</sup> The Minister for Energy is expected to make WEM Amending Rules to give effect to the outcomes of the RCM Review in late 2023.

## 6.3 Wholesale Market Objectives

The Coordinator considers that the RCM Review has addressed the issues raised in RC\_2019\_03, that the Review Outcomes from the RCM Review took account of the Wholesale Market Objectives and that there would be no benefit to making further changes to the RLM.

## 6.4 Protected Provisions

The Coordinator's final decision is to reject the Rule Change Proposal, so this RC\_2019\_03 will not impact on any Protected Provisions.

## 6.5 Civil Penalty Provisions

The Coordinator's final decision is to reject the Rule Change Proposal, so RC\_2019\_03 will not impact on any Civil Penalty Provisions.

## 6.6 Reviewable Decisions

The Coordinator's final decision is to reject the Rule Change Proposal, so RC\_2019\_03 will not impact any Reviewable Decisions.

## 6.7 Cost and Practicality of Implementation

The estimated cost for AEMO to implement the proposed draft WEM Amending Rules from the Draft Rule Change Report is provided in section 6.6.1 of that report. Section 6.6.2 of the Draft Rule Change Report indicates the advice provided by AEMO and Market Participants regarding the practicality of implementing the draft WEM Amending Rules, including the time required to develop and implement changes to IT systems/processes or internal procedures. No updates regarding these practicality matters have been provided to the Coordinator.

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<sup>26</sup> The draft Amending Rules are available at [Reserve Capacity Mechanism Review \(www.wa.gov.au\)](http://www.wa.gov.au).

AEMO estimated that:

- while a similar level of development activities is required to implement the Rule Change Panel's amended RLM in comparison with the ERA's proposed RLM, a better understanding of the project scope has changed the original contingency estimate; and
- it would cost AEMO about \$566,000 to implement the Draft Rule Change Proposal and would require six to eight months to implement, including development of a WEM Procedure.

Alinta, Collgar, the ERA, the ICG and Perth Energy anticipated that the costs and operational changes required to implement the proposed WEM Amending Rules from the Draft Rule Change Report would be negligible. Collgar and Metro Power noted that they can implement the changes immediately.

The ICG considered that the changes in the Draft Rule Change Report will erode the value of the Mumbida Wind Farm by over 60%, which is an untenable risk that could not have been foreseen when investing in the wind farm and would likely have prevented construction of the Facility had the arrangements been in place in 2011. The ICG considered there to be a heightened sovereign risk created by the Draft Rule Change Report that negatively impacted ICG's and other potential investors' views on future investment in Intermittent Facilities in the WEM.

### 6.7.1 Assessment

The Coordinator has made a final decision to reject RC\_2019\_03 because the issues raised in this Rule Change Proposal were addressed by the RCM Review and will be implemented by the draft WEM Amending Rules currently undergoing consultation.

The Coordinator considers that the RCM Review addressed the issues in RC\_2019\_03 and that the RCM Review took account of the Wholesale Market Objectives.

The RLM will be amended as a result of the RCM Review, and it would be impractical to make further changes to the RLM at this time because making further changes would come at a cost and will have no benefit.

## 7. WEM Amending Rules

EPWA is consulting on the draft WEM Amending Rules to implement the RCM Review Outcomes. These WEM Amending Rules will be implemented instead of the proposed WEM Amending Rules from the Draft Rule Change Report.

The draft WEM Amending Rules were published for consultation on 14 September 2023 and submissions are due by 5:00 PM (AWST) on 19 October 2023.<sup>27</sup> The Minister for Energy is expected to make WEM Amending Rules to give effect to the outcomes of the RCM Review in late 2023.

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<sup>27</sup> The draft Amending Rules are available at [Reserve Capacity Mechanism Review \(www.wa.gov.au\)](http://www.wa.gov.au).

**Energy Policy WA**

Level 1, 66 St Georges Terrace, Perth WA 6000

Locked Bag 100, East Perth WA 6892

Telephone: 08 6551 4600

[www.energy.wa.gov.au](http://www.energy.wa.gov.au)

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