



## Meeting Agenda

|                        |  |
|------------------------|--|
| <b>Meeting Title:</b>  | Cost Allocation Review Working Group (CARWG) |
| <b>Meeting Number:</b> | 2023_05_02                                   |
| <b>Date:</b>           | Tuesday 2 May 2023                           |
| <b>Time:</b>           | 1:00pm to 3:00pm                             |
| <b>Location:</b>       | Online, via TEAMS.                           |

| Item | Item   | Responsibility   | Type       | Duration |
|------|--|------------------|------------|----------|
| 1    | Welcome and Agenda   | Chair            | Noting     | 2 min    |
| 2    | Meeting Apologies/Attendance   | Chair            | Noting     | 2 min    |
| 3    | Minutes of Meeting 2023_03_21  | Chair            | Decision   | 2 min    |
| 4    | Action Items   | Chair            | Noting     | 5 min    |
| 5    | Final Design<br>1. Timeline and purpose<br>2. Final Design:<br>a. Frequency Regulation – amended WEM Deviation Method<br>b. Contingency Reserve Lower – amended allocation method<br>c. Market Fees – Energy Storage Resource costs recovery<br>d. Contingency Reserve Raise – treatment of facilities with multiple connections under the Runway Method | Marsden<br>Jacob | Discussion | 100 min  |
| 6    | Next Steps   | Chair            | Noting     | 5 min    |
| 7    | General Business   | Chair            | Discussion | 4 min    |
|      | Next Meeting: TBD  |                  |            |          |

Please note this meeting will be recorded.

## Competition and Consumer Law Obligations

Members of the Cost Allocation Review Working Group (**Members**) note their obligations under the *Competition and Consumer Act 2010 (CCA)*.

If a Member has a concern regarding the competition law implications of any issue being discussed at any meeting, please bring the matter to the immediate attention of the Chairperson.

Part IV of the CCA (titled "Restrictive Trade Practices") contains several prohibitions (rules) targeting anti-competitive conduct. These include:

- (a) **cartel conduct**: cartel conduct is an arrangement or understanding between competitors to fix prices; restrict the supply or acquisition of goods or services by parties to the arrangement; allocate customers or territories; and or rig bids.
- (b) **concerted practices**: a concerted practice can be conceived of as involving cooperation between competitors which has the purpose, effect or likely effect of substantially lessening competition, in particular, sharing Competitively Sensitive Information with competitors such as future pricing intentions and this end:
  - a concerted practice, according to the ACCC, involves a lower threshold between parties than a contract arrangement or understanding; and accordingly; and
  - a forum like the Cost Allocation Review Working Group is capable being a place where such cooperation could occur.
- (c) **anti-competitive contracts, arrangements understandings**: any contract, arrangement or understanding which has the purpose, effect or likely effect of substantially lessening competition.
- (d) **anti-competitive conduct (market power)**: any conduct by a company with market power which has the purpose, effect or likely effect of substantially lessening competition.
- (e) **collective boycotts**: where a group of competitors agree not to acquire goods or services from, or not to supply goods or services to, a business with whom the group is negotiating, unless the business accepts the terms and conditions offered by the group.

A contravention of the CCA could result in a significant fine (up to \$500,000 for individuals and more than \$10 million for companies). Cartel conduct may also result in criminal sanctions, including gaol terms for individuals.

**Sensitive Information** means and includes:

- (a) commercially sensitive information belonging to a Member's organisation or business (in this document such bodies are referred to as an Industry Stakeholder); and
- (b) information which, if disclosed, would breach an Industry Stakeholder's obligations of confidence to third parties, be against laws or regulations (including competition laws), would waive legal professional privilege, or cause unreasonable prejudice to the Coordinator of Energy or the State of Western Australia).

### Guiding Principle – what not to discuss

In any circumstance in which Industry Stakeholders are or are likely to be in competition with one another a Member must not discuss or exchange with any of the other Members information that is not otherwise in the public domain about commercially sensitive matters, including without limitation the following:

- (a) the rates or prices (including any discounts or rebates) for the goods produced or the services produced by the Industry Stakeholders that are paid by or offered to third parties;
- (b) the confidential details regarding a customer or supplier of an Industry Stakeholder;
- (c) any strategies employed by an Industry Stakeholder to further any business that is or is likely to be in competition with a business of another Industry Stakeholder, (including, without limitation, any strategy related to an Industry Stakeholder's approach to bilateral contracting or bidding in the energy or ancillary/essential system services markets);
- (d) the prices paid or offered to be paid (including any aspects of a transaction) by an Industry Stakeholder to acquire goods or services from third parties; and
- (e) the confidential particulars of a third party supplier of goods or services to an Industry Stakeholder, including any circumstances in which an Industry Stakeholder has refused to or would refuse to acquire goods or services from a third party supplier or class of third party supplier.

### Compliance Procedures for Meetings

If any of the matters listed above is raised for discussion, or information is sought to be exchanged in relation to the matter, the relevant Member must object to the matter being discussed. If, despite the objection, discussion of the relevant matter continues, then the relevant Member should advise the Chairperson and cease participation in the meeting/discussion and the relevant events must be recorded in the minutes for the meeting, including the time at which the relevant Member ceased to participate.



## Minutes

|                       |  |
|-----------------------|--|
| <b>Meeting Title:</b> | Cost Allocation Review Working Group (CARWG) |
| <b>Date:</b>          | 21 March 2023                                |
| <b>Time:</b>          | 1:00pm – 3:05pm                              |
| <b>Location:</b>      | Microsoft TEAMS                              |

| Attendees           | Company                           | Comment   |
|---------------------|-----------------------------------|-----------|
| Dora Guzeleva       | Chair                             |           |
| Oscar Carlberg      | Alinta Energy                     |           |
| Daniel Kurz         | Summit Southern Cross Power       |           |
| Jake Flynn          | Collgar Wind Farm                 |           |
| Noel Schubert       | Small-Use Consumer Representative |           |
| Mark McKinnon       | Western Power                     |           |
| Genevieve Teo       | Synergy                           |           |
| Paul Arias          | Shell Energy                      |           |
| Donna Todesco       | AEMO                              |           |
| Tessa Liddelow      | Shell                             |           |
| Cameron Parrotte    | Woodside                          |           |
| Toby Price          | AEMO                              | Observer  |
| Tom Geiser          | Neoen                             | Observer  |
| Nathan Ling         | Neoen                             | Observer  |
| Grant Draper        | Marsden Jacob Associates (MJA)    | Presenter |
| Peter McKenzie      | MJA                               | Presenter |
| Stephen Eliot       | Energy Policy WA (EPWA)           |           |
| Shelley Worthington | EPWA                              |           |

| Apologies   | From          | Comment |
|-------------|---------------|---------|
| Jason Froud | Synergy       |         |
| Tom Froud   | Bright Energy |         |

| Item | Subject   | Action                          |
|------|---|---------------------------------|
| 1    | <p><b>Welcome and Agenda</b></p> <p>The Chair opened the meeting at 1:00pm.</p>   |                                 |
| 2    | <p><b>Meeting Apologies/Attendance</b></p> <p>The Chair noted the attendance as listed above.</p> <p>The Chair noted the competition law obligations of CARWG members.</p>  |                                 |
| 3    | <p><b>Minutes of CARWG Meeting 2022_11_29</b></p> <p>The minutes of the CARWG meeting held on 29 November 2022 were accepted as a true and accurate record of the meeting.</p> <p><b>Action: The CARWG Secretariat is to publish the minutes of the 29 November 2023 CARWG meeting on the Coordinator's website as final.</b></p>   | <p><b>CARWG Secretariat</b></p> |
| 4    | <p><b>Action Items:</b></p> <p>The Chair noted that there were no open action items.</p>  |                                 |
| 5    | <p><b>Timeline and Purpose</b></p> <p>Mr Draper noted where the project is on its timeline and indicated that the purpose of the meeting was to get agreement on the recommendations so that the project could move to the detailed design phase.</p>   |                                 |
| 6    | <p><b>Feedback from the Consultation Process and Potential Refinements of Methods</b></p> <p><b>(a) Frequency Regulation – WEM Deviation Method</b></p> <p>Mr Draper noted that EPWA had received substantial feedback on the allocation of Frequency Regulation costs, particularly from AEMO.</p> <p>Mr Draper noted that Alinta and Synergy have raised concerns that the proposed method to allocate Frequency Regulation costs does not address the contribution of behind the meter photovoltaic (PV) to frequency deviations.</p> <ul style="list-style-type: none"> <li>Mr Carlberg indicated that Alinta's main concern is that a cost-benefit analysis has not been done to determine that the proposed WEM Deviation Method will have a net benefit. <a href="#"><u>Mr Carlberg noted that the recommendation in the consultation paper was to conduct a cost-benefit analysis before implementing the WEM Deviation Method and considered that this should not be omitted.</u></a></li> </ul> <p>Ms Guzeleva indicated that AEMO published an update in September 2021 indicating that one of the top priorities should be for Market Participants to receive signals that reflect their contribution to frequency response costs and that, if Market Participants are not given an incentive to improve performance,</p> |                                 |

| Item | Subject   | Action |
|------|---|--------|
|      | <p>then Essential System Services (ESS) costs will increase significantly.</p> <ul style="list-style-type: none"> <li>• Mr Price agreed with this point.</li> </ul> <p>Ms Guzeleva indicated that there is already evidence of increases in ESS costs and asked if a cost-benefit analysis is really necessary.</p> <ul style="list-style-type: none"> <li>• Mr Carlberg suggested that a cost-benefit analysis is necessary if we are considering a two-step process to first use the WEM Deviation Method and then switch to the new NEM Causer Pays Method at a later date, <u>noting the potential implementation costs and that there are competing priority issues in the energy sector.</u></li> <li>• Mr Carlberg asked if Semi-Scheduled Facilities will be able to improve forecasting or if we can just get AEMO to do the forecasting.</li> </ul> <p>Mr Draper outlined two options for refining the WEM Deviation Method:</p> <ol style="list-style-type: none"> <li>1. measure deviations from linear dispatch targets over 30-minute Trading Intervals (not average of deviation from linear dispatch targets over 5-minute intervals for each 30-minute period, as previously proposed); and</li> <li>2. use Balancing Market submissions for Semi-Scheduled Generation as the forecast for start and end points for each 30-minute period and measure deviations from a linear dispatch target.</li> </ol> <p>Mr Draper noted the pros and cons of the options and Mr McKenzie presented some modelling results for these options.</p> <p>Mr Draper outlined the three options for calculating contribution factors under the WEM Deviation Method:</p> <ol style="list-style-type: none"> <li>1. Standard Deviation Method – use the standard deviation from the target in a 30-minute period;</li> <li>2. Summation Method – use the sum of the absolute value of deviations from the target in a 30-minute period; and</li> <li>3. Maximum Absolute Deviation Method – use the single highest absolute value of deviation from the target in the 30-minute period</li> </ol> <p>Mr McKenzie outlined the modelling results for these options.</p> <p>Mr Draper indicated that the current recommendation was to use the WEM Deviation Method, using historic SCADA data to set the hypothetic linear target for a 30-minute period, and using the Summation Method to calculate the contribution factors.</p> |        |

| Item | Subject   | Action                           |
|------|---|----------------------------------|
|      | <p>In response to a question from Mr Price, Ms Guzeleva reminded the CARWG that this method would only apply for Semi-Scheduled Generators, not Scheduled Generators.</p> <ul style="list-style-type: none"> <li>Mr Carlberg asked what a Market Participant can do to minimise variations.</li> </ul> <p>Ms Guzeleva indicated that the Cost Allocation Review is about allocating Frequency Regulation costs as a means to reduce volatility, not targeting improved forecasts.</p> <ul style="list-style-type: none"> <li>Mr Carlberg <del>asked if</del><u>questioned whether</u> we will see installation of batteries at intermittent generator sites to reduce Frequency Regulation <del>if-as</del> the cost of putting the battery in that location <del>is</del><u>may not be</u> lower than the cost of Frequency Regulation.</li> </ul> <p>Ms Guzeleva asked if we also want to provide incentives for improved forecasts.</p> <ul style="list-style-type: none"> <li>Mr Carlberg suggested that using the previous interval may be the best forecast that Market Participants can do, in which case it may be better to give AEMO responsibility for forecasting using this method.</li> </ul> <p>Ms Guzeleva indicated that there appears to be three options on how to proceed, as follows, and that EPWA, AEMO and MJA should meet to discuss the options:</p> <ol style="list-style-type: none"> <li>use the WEM Deviation Method, as modified in the slides presented on 21 March 2023;</li> <li>use the WEM Deviation Method using Balancing Market submissions to set the linear dispatch target for Semi-Scheduled Generation; or</li> <li>continue with the current cost allocation method and reconsider the new NEM Causer Pays Method after it has been implemented in the NEM.</li> </ol> |                                  |
|      | <p><b>ACTION: EPWA, AEMO and MJA to meet to discuss the options for allocating Frequency Regulation costs.</b></p>  | <p><b>EPWA, AEMO and MJA</b></p> |

#### **(b) Contingency Reserve Lower – Potential Changes to the Proposed Allocation Methodology**

Mr Draper noted that there is agreement that large new loads in the SWIS will have a significant impact on Contingency Reserve Lower requirements and that the cost allocation method needs to account for this impact.

- Mr Geiser raised concerns with the proposed threshold and suggested that it would be fairer to apply the Runway Method to loads above 150 MW rather than 120 MW.

Mr Draper noted that increasing the threshold to 150 MW only made a small difference, reducing the allocation for large

| Item | Subject  | Action |
|------|--|--------|
|      | <p>(250 MW) battery energy storage system (BESS) from 48.7% to 44.1%.</p>  |        |
|      | <ul style="list-style-type: none"> <li>• Mr Geiser noted that Neoen’s concern was not only with the threshold, but also with the methodology, because changing the threshold made little difference as the Runway Method: <ul style="list-style-type: none"> <li>○ assigns most of the costs to the largest load;</li> <li>○ incentivises the largest load to consume less than the next largest; and</li> <li>○ incentivises assets to operate less efficiently to avoid costs.</li> </ul> </li> <li>• Mr Geiser noted that Neoen’s proposal was intended to spread the costs around, reducing the intensity of the Runway Method for larger loads.</li> <li>• Mr Geiser noted that there would always be a requirement for a contingency regardless of the size of loads because a transmission line can trip, and suggested that all Contingency Reserve Lower costs should be allocated pro-rata above 100 MW to smooth out costs, with the end result being that the biggest load pays the most and therefore has an incentive to be smaller.</li> <li>• Mr Geiser noted that there are efficiency benefits to having 200 MW loads and it is not efficient to encourage investment in, for example, aluminum smelters in 99 MW blocks, simply to avoid paying costs.</li> </ul> |        |
|      | <p>Mr Draper noted that lowering the threshold would smooth out costs, with more of the costs attributed to other loads across the system, and noted that the Runway Method is used to allocate costs for Contingency Reserve Raise services. Mr Draper noted that it is appropriate for the largest generators to pay the most Contingency Reserve Raise costs and for the same principle to apply to loads.</p>  |        |
|      | <ul style="list-style-type: none"> <li>• Mr Geiser indicated that he has the same concerns with Contingency Reserve Raise, noting that if Neoen were to build a 250 MW battery and the largest other generator is 200 MW, then they would bid below the other generator to avoid costs.</li> <li>• Mr Eliot noted that what Mr Geiser had requested was what was modelled and presented in the slides.</li> <li>• Mr Geiser disagreed, noting that the largest unit in his proposal might carry about 27% of the cost rather than 50%, with more costs distributed to smaller units because there is some minimum amount of contingency that is required no matter what. Mr Geiser noted that slide 28 was not represented in the way that he proposed.</li> </ul>   |        |

| Item | Subject   | Action |
|------|---|--------|
|      | <p>Mr Draper noted that, under Mr Geiser’s proposal, smaller loads would get a much higher share of costs to smooth out cost for larger load.</p> <ul style="list-style-type: none"> <li>Mr Geiser noted that his proposal shifted costs but that it did not resolve the problem created by the binary threshold.</li> </ul> <p>Ms Guzeleva noted that it was clear from the discussion that storage proponents would find it uncomfortable to wear most of the Contingency Reserve Lower costs simply because they happen to be the largest load on the system. Ms Guzeleva noted that the Runway Method for generators has existed for longer than the WEM itself, and the method is based on sound principles, but noted that Mr Geiser did not agree.</p> <ul style="list-style-type: none"> <li>In response to a question from Ms Guzeleva, Mr Geiser noted that, in the NEM, every MW of load pays for its share relative to total load – for example if the total load is 1,000 MW, then a 100 MW load would pay 10%. Mr Geiser noted that the NEM approach was too soft and that the concept of the Runway Method makes sense in terms of allocating a larger proportion than pro-rata.</li> </ul> <p>Ms Guzeleva noted the group was back to the same position (i.e. those that are negatively affected by a proposal have very strong objections to the proposal irrespective of whether the proposal is consistent with the agreed principles).</p> <p>Ms Guzeleva noted that the size of the largest load will soon increase from 120 MW to over 200 MW, and it was unreasonable to keep the current cost allocation method in place.</p> <p>Ms Guzeleva noted that we could go with the approach that is used in the NEM or an alternative option for AEMO to assign risk factors to the different types of loads. Ms Guzeleva noted that there have been assertions that a storage facility carries a significantly lower risk than its transmission connection and asked whether it would be fairer to allocate Contingency Reserve Lower costs based on the risk associated with transmission connections rather than the loads, noting that this may have the same effect for facilities behind a single connection point.</p> <p>Ms Guzeleva asked if there was a way for the AEMO to determine risk factors for facilities based on network connections rather than trying to second guess what the next big load is and have a threshold which could end up been wrong in two or three years’ time.</p> <p>Mr Draper noted that the current proposal was to apply the Runway Method first to the loads and ten to the networks.</p> <p>Ms Guzeleva suggested to only apply the method to the network connections and asked whether that would make any difference.</p> <p>Mr Draper summarised that Ms Guzeleva was proposing that, as the network tripping is a bigger risk than any BESS, then it may</p> |        |

| Item | Subject  | Action |
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|      | <p>be appropriate to allocate Contingency Reserve Lower Costs based only on the network risk.</p> <p>Ms Guzeleva noted there were two layers, the Facility risk and the network risk, and regardless of how the risk for loads differ, the transmission connection may be the “weakest link”.</p> <p>Ms Guzeleva noted that loads and generation are not currently treated equally – the Runway Method applies to generators but not to loads, and the intent was to try to bring them into some sort of alignment. Ms Guzeleva noted that the point has been made that storage facilities have lower risk of tripping in comparison to generators. Ms Guzeleva asked the CARWG to provide their views.</p> <ul style="list-style-type: none"> <li>• Mr Schubert considered that the Runway Method is reasonable if some of what Mr Geiser had suggested can be adopted and not make it so binary and so onerous on the biggest load.</li> </ul> <p>Ms Guzeleva noted that allocating most costs to the largest load is the point of the Runway Method, and it would no longer be the “Runway Method” if something was done to smooth out this effect.</p> <p>Ms Guzeleva asked Mr Geiser to provide EPWA with the calculations for his proposal to make sure that EPWA has a proper understanding of it.</p> <p>Ms Guzeleva asked the CARWG whether the focus should be on transmission risk because loads, especially storage, may not have the same Facility Risk as generators.</p> <p>Mr Draper asked if AEMO had any insight into the comparative risk of tripping between BESS and generators.</p> <ul style="list-style-type: none"> <li>• Mr Price responded that he could look into the statistics, but he expects that there is clearly a higher risk for a mechanically spinning generator versus an inverter.</li> </ul> <p>Ms Guzeleva asked if a synchronous generator would have a different risk profile.</p> <ul style="list-style-type: none"> <li>• Mr Price noted that it would depend on the Facility, its location, its control scheme and its protection scheme.</li> <li>• Mr Price indicated that there are different causes of faults for synchronous machines versus asynchronous machines, and that allocation of costs comes down to the fundamentals of fairness around risk allocation.</li> <li>• Mr Price agreed with Mr Geiser that the system requires large batteries, and that the Runway Method may disincentivise a large battery from delivering what the system needs, but it is ultimately the plant configuration that determines its risk to the system.</li> </ul> |        |

| Item | Subject  | Action |
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|      | <p>Ms Guzeleva noted that some type of a risk factor assignment may actually be the right way to go, because loads may differ considerably and may have completely different profiles in terms of their forced outages.</p>  |        |
|      | <ul style="list-style-type: none"> <li>• Mr Price noted that the AEMO has to cover the risk of the largest load tripping irrespective of its type.</li> <li>• Mr Parrotte noted that anything can trip at any point and that AEMO must cover any credible risk.</li> </ul>   |        |
|      | <p>Ms Guzeleva asked, with regard to storage, if it was the connection or if it was the storage facility that was likely to trip.</p>  |        |
|      | <ul style="list-style-type: none"> <li>• Mr Parrotte noted that this would depend on how the facility was configured and if the battery has one 200 MW connection that could trip at any point.</li> </ul>   |        |
|      | <p>Ms Guzeleva noted that was exactly what she was referring to and asked if it is the risk of the battery tripping that needs to be covered or the risk of a particular network connection, and noted that Mr Geiser has advised that they have never experienced a battery trip.</p>   |        |
|      | <ul style="list-style-type: none"> <li>• Mr Parrotte indicated that a battery may have a lower risk of tripping than a synchronous generator, but it can trip, so AEMO has to address this risk when it sets the Contingency Reserve Lower quantity.</li> </ul>  |        |
|      | <p>Ms Guzeleva noted that AEMO has been carrying 70% of spinning reserve and load rejection traditionally and asked what that was based on.</p>  |        |
|      | <ul style="list-style-type: none"> <li>• Mr Parrotte noted that this was because the system responds in other ways when the frequency goes up or down.</li> </ul>  |        |
|      | <p>Ms Guzeleva asked if that was equally true for loads and generators.</p>  |        |
|      | <ul style="list-style-type: none"> <li>• Mr Price noted that that the 70% multiplier is a simplification of the physics of the system, and that this will be more dynamic in the future, based on load conditions.</li> <li>• Mr Price indicated that you get a response if either a load or generator trips, and it will not necessarily be symmetrical, but this just means that AEMO would need to purchase more or less of the services (Contingency Reserve Raise or Contingency Reserve Lower).</li> </ul> |        |
|      | <p>Mr Draper noted that AEMO needs to cover any credible risk and questioned if the probability of the battery having a forced outage is zero.</p>   |        |
|      | <ul style="list-style-type: none"> <li>• Mr Price noted that AEMO considers any single Facility with a single connection point to be a credible contingency, irrespective of whether they have ever tripped. Mr Price noted that the only time there would be lower risk was if</li> </ul>   |        |

| Item | Subject   | Action |
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|      | <p>there were two totally distinct Facilities with separate connections that may have been aggregated, because they share the same loss factors, and AEMO would not consider it credible that they would both trip at the same time.</p> <p>Ms Guzeleva asked Mr Price to advise what the requirement for AEMO to determine the Facility risk value means in practice.</p> <p>Ms Guzeleva noted that there were three options:</p> <ul style="list-style-type: none"> <li>• continue with the current cost allocation method;</li> <li>• the existing proposal; and</li> <li>• Neoen’s proposal.</li> </ul> |        |
|      | <p><b>ACTION: Neoen to provide EPWA with the calculations for its proposal to allocate Contingency Reserve Lower costs so that EPWA can make sure that it has a proper understanding of it.</b></p>   | Neoen  |
|      | <p><b>ACTION: AEMO to provide further information on the risk of tripping for loads, batteries and generators.</b></p>  | AEMO   |
|      | <p><b>ACTION: AEMO to advise what a requirement for it to determine the risk factor of a facility would mean in practice.</b></p>   | AEMO   |

**(c) Contingency Reserve Raise –Treatment of Multiple Dispatchable Units under the Runway Method**

Mr Draper noted that, if a generator has two units and two separate metering points, then the two units should be treated separately from the perspective of applying the Runway Method because the units are electrically independent.

Mr Draper discussed a proposal for the process that AEMO would follow in assessing multiple dispatchable units (slide 24) and how Facilities would be assigned a Facility Risk Value as either a single aggregated unit or separate dispatchable units.

- Mr Schubert noted that AEMO, and Western Power in some cases, would need to look at each Facility to determine what their Credible Contingency is, noting that they would not only need to take into account whether a Facility had electrically separate control systems or protection systems but also whether the two connection points could actually trip at the same time. Mr Schubert noted there would need to be a process to identify what are credible contingencies for each Facility.

Ms Guzeleva noted that this suggests that AEMO would need to determine the risk on a case-by-case basis.

- Mr Price noted it would be difficult to set a prescriptive process in the rules to assess what a credible risk is. Mr Price suggested that AEMO could be provided a head of power to define a risk quantity but that he would need to

| Item            | Subject   | Action             |
|-----------------|---|--------------------|
|                 | <p>discuss this internally within AEMO to see if this would be supported.</p> <ul style="list-style-type: none"> <li>Mr Price and Mr Parrotte noted that this proposal may require facilities to provide AEMO with more information about the facilities – how they are configured, how the control schemes interact and other more detailed engineering inputs.</li> </ul> <p>Mr Draper noted that it would be hard to design definitive rules for this but it appeared that much of the focus would on the other side of the switchboard.</p> <p>Ms Guzeleva noted that implementing this proposal may only require a slight amendment to the 1 October 2023 rules.</p> |                    |
|                 | <p><b>ACTION: AEMO to advise whether it would support AEMO being given a head of power to define a Contingency Reserve Raise risk factor for facilities with multiple units behind multiple connections.</b></p>  | <p><b>AEMO</b></p> |
|                 | <p><b>(d) Market Fees – BESS Cost Recovery</b><br/>Discussion of this agenda item was deferred due to time constraints.</p>   |                    |
| <p><b>7</b></p> | <p><b>Next Steps</b><br/>The Chair indicated that EPWA would consider next steps as a result of the issues raised.</p>  |                    |
| <p><b>8</b></p> | <p><b>General Business</b><br/>No general business was discussed.</p>   |                    |

**The meeting closed at 3:05pm.**

## Agenda Item 4: CARWG Action Items

Cost Allocation Review Working Group (CARWG) Meeting 2023\_05\_02

|          |  |
|----------|--|
| Shaded   | Shaded action items are actions that have been completed since the last MAC meeting.                           |
| Unshaded | Unshaded action items are still being progressed.  |
| Missing  | Action items missing in sequence have been completed from previous meetings and subsequently removed from log. |

| Item | Action  | Responsibility  | Meeting Arising | Status   |
|------|---|-----------------|-----------------|--|
| 11   | The CARWG Secretariat is to publish the minutes of the 29 November 2023 CARWG meeting on the Coordinator's website as final.  | EPWA            | 2023_03_21      | <b>Closed</b><br>The minutes were posted on the website on 20 April 2022.  |
| 12   | Energy Policy WA (EPWA), AEMO and Marsden Jacob Associates (MJA) to meet to discuss the options for allocating Frequency Regulation costs.                                    | EPWA, AEMO, MJA | 2023_03_21      | <b>Closed</b><br>EPWA, AEMO and MJA met on 28 March 2023. The discussion at this meeting has informed the revised recommendations to be discussed under Agenda Item 5. |
| 13   | Neoen to provide EPWA with the calculations for its proposal to allocate Contingency Reserve Lower costs so that EPWA can make sure that it has a proper understanding of it. | Neoen           | 2023_03_21      | <b>Open</b><br>Neoen has not provided a response on this action item.  |

| Item | Action  | Responsibility | Meeting Arising | Status   |
|------|---|----------------|-----------------|--|
| 14   | AEMO to provide further information on the risk of tripping for loads, batteries and generators.            | AEMO           | 2023_03_21      | <b>Open</b><br>AEMO has not provided a response on this action item. |
| 15   | AEMO to advise what a requirement for it to determine the risk factor of a facility would mean in practice. | AEMO           | 2023_03_21      | <b>Open</b><br>AEMO has not provided a response on this action item. |



Government of Western Australia  
Energy Policy WA

# Cost Allocation Review: Final Design

2 May 2023

Working together for a  
**brighter** energy future.

# Agenda

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## 1. Timeline and purpose

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## 2. Final Design:

- a. Frequency Regulation – amended WEM Deviation Method
  - b. Contingency Reserve Lower – amended allocation method
  - c. Market Fees – Energy Storage Resource (ESR) cost recovery
  - d. Contingency Reserve Raise – treatment of facilities with multiple connections under the Runway Method
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## 3. Next Steps

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# 1. Timeline and Purpose



# Updated Project Timeline

| Step  | Time         |
|---|--------------|
| 1. Final CARWG Meeting  | 2 May 2023   |
| 2. MAC meeting <ul style="list-style-type: none"> <li>• draft Information Paper (final design)</li> </ul> | 8 June 2023  |
| 3. Publish Information Paper  | 29 June 2023 |
| 4. Publish draft Amending Rules   | TBD          |
| 5. Submissions close on draft Amending Rules  | TBD          |
| 6. EPWA to seek Ministerial approval for the Amending Rules   | TBD          |
| 7. Commencement of the Amending Rules   | October 2025 |

# Purpose

- AEMO and Market Participants raised some concerns with the proposals at the 21 March 2023 CARWG meeting
- EPWA and AEMO met on 28 March 2023 to discuss the concerns raised by the CARWG
- EPWA has considered these matters and proposes revised design for the Cost Allocation Review

## 2. Final Design



## 2(a) Frequency Regulation – Amended WEM Deviation Method

## Previous Proposal: WEM Deviation Method

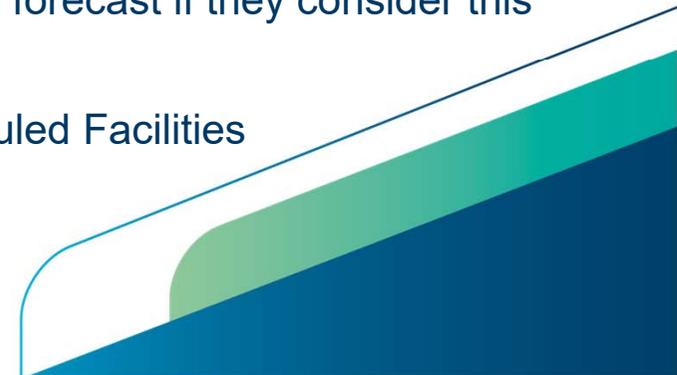
- At the 21 March 2023 CARWG meeting, EPWA proposed implementing the WEM Deviation Method using:
  - SCADA data to measure deviations from a linear dispatch targets in a 30 minute period; and
  - summation of the absolute value of deviations from the linear target
- The CARWG raised concerns with this proposal:
  - Measuring deviations from a linear dispatch target in a 30 minute period is inconsistent with the 5 minute dispatch periods under the new Real Time Market (RTM)
  - Establishing start and end period targets for measuring deviations from the linear dispatch targets in the RTM:
    - 5-minute dispatch targets will be established (created by the WEMDE) for Scheduled Facilities and for Semi-Scheduled Facilities that provide ESS; but
    - there will be no dispatch targets for Semi-Scheduled or Non-Scheduled Facilities



# Revised Design: WEM Deviation Method

Apply the WEM Deviation Method with the following changes:

- Apply to each 5-minute dispatch interval, consistent with the RTM
- Use the dispatch target from WEMDE for each 5-minute dispatch interval to set the targets for Scheduled Facilities and Semi-Scheduled Facilities that provide ESS, and
- AEMO responsible for determining dispatch forecasts for each Semi-Scheduled Facility and Non-Scheduled Facility
  - Consistent with current default practices in the NEM for applying the FCAS causer-pays method
  - Facilities to have the option to provide their own forecasts
    - AEMO will likely provide an Unconstrained Injection Forecast for a Semi-Scheduled Facility, which provides Facilities with an opportunity to provide their own forecast if they consider this would be more accurate
- Use these forecasts to set the 5-minute dispatch target for Semi-Scheduled Facilities



## Revised Design: WEM Deviation Method

- Exclude Facilities that are scheduled to provide Regulation Services
  - Non-performance in the provision of Regulation Services will be managed under the relevant WEM Rules/Procedures
- AEMO is to develop a method for excluding deviations that result from Facilities providing primary frequency response
  - This can be required if there is insufficient response to a system frequency deviation
  - This could include adjusting deviations for a Facility when system frequency is outside of the Normal Operating Frequency Band
- This approach is similar to the Forecast Range Method outlined in the Consultation Paper (15 December 2022)
  - The Forecast Range Method used ex ante forecasts to establish dispatch targets for cost allocation purposes and was taken into account in AEMO's determination of the Frequency Regulation requirement
- Implement the WEM Deviation Method in October 2025

**Does the CARWG have any specific objections to this approach?**



# High-Level Qualitative Cost-Benefit Analysis

- The Consultation Paper suggested that a cost-benefit assessment of the WEM Deviation Method should be undertaken before accepting the recommendation to adopt a new cost allocation method
- The following slides provide a high-level qualitative assessment of the potential costs and benefits of adopting causer-pays cost allocation methods for Frequency Regulation (such as the WEM Deviation Method)
  1. Implementation costs are likely to be moderate for AEMO and Market Participants:
    - WEMDE will set 5-minute dispatch targets for Scheduled Facilities and Semi-Scheduled Facilities providing ESS
    - AEMO will set default dispatch forecasts for Semi-Scheduled Facilities
    - Facilities can opt in to develop their own forecasts, but this is not required
    - A spreadsheet model (with macros) can be used to apply the WEM Deviation Method to calculate causer pays factors
      - A spreadsheet model has been used to implement the NEM Causer Pays method (a much more complicated cost allocation method) since market start

## High-Level Qualitative Cost-Benefit Analysis (cont.)

2. The Benefits of reducing Regulation services are significant
  - LFAS requirements have increased substantially since 2018/19 (slide 13)
  - The increase to LFAS requirements in the WEM is partly due to increased Variable Renewable Energy (VRE) (slide 14)
  - A causer-pays method to allocate Regulation services can change behaviour and reduce future requirements for Regulation services (slides 16 and 17)
  - The costs of increasing Regulation requirements is substantial:
    - ERA estimated that a 10 MW increase in the LFAS quantity from July 2021, from +/-100 MW to +/-110 MW could cost an additional \$5.6 million (8.3%) over a 12-month period <sup>(a)</sup>
    - AEMO estimated that a further increase in LFAS requirements, from +/-110 MW to +/-120 MW could increase costs by a further \$7.4 million annually (10.2%) annually <sup>(a)</sup>
    - Marsden Jacob has estimated that cumulative increases in Peak Frequency Regulation Service Requirements could result in costs increasing by \$43.3 million by 2026/27 (slide 15)
  - If the WEM Deviation Method can help reduce regulation requirements by +/-10 MW, then annual savings of around \$7.4 million can be achieved with a modest increase in implementation and operational costs (based on AEMO estimates)

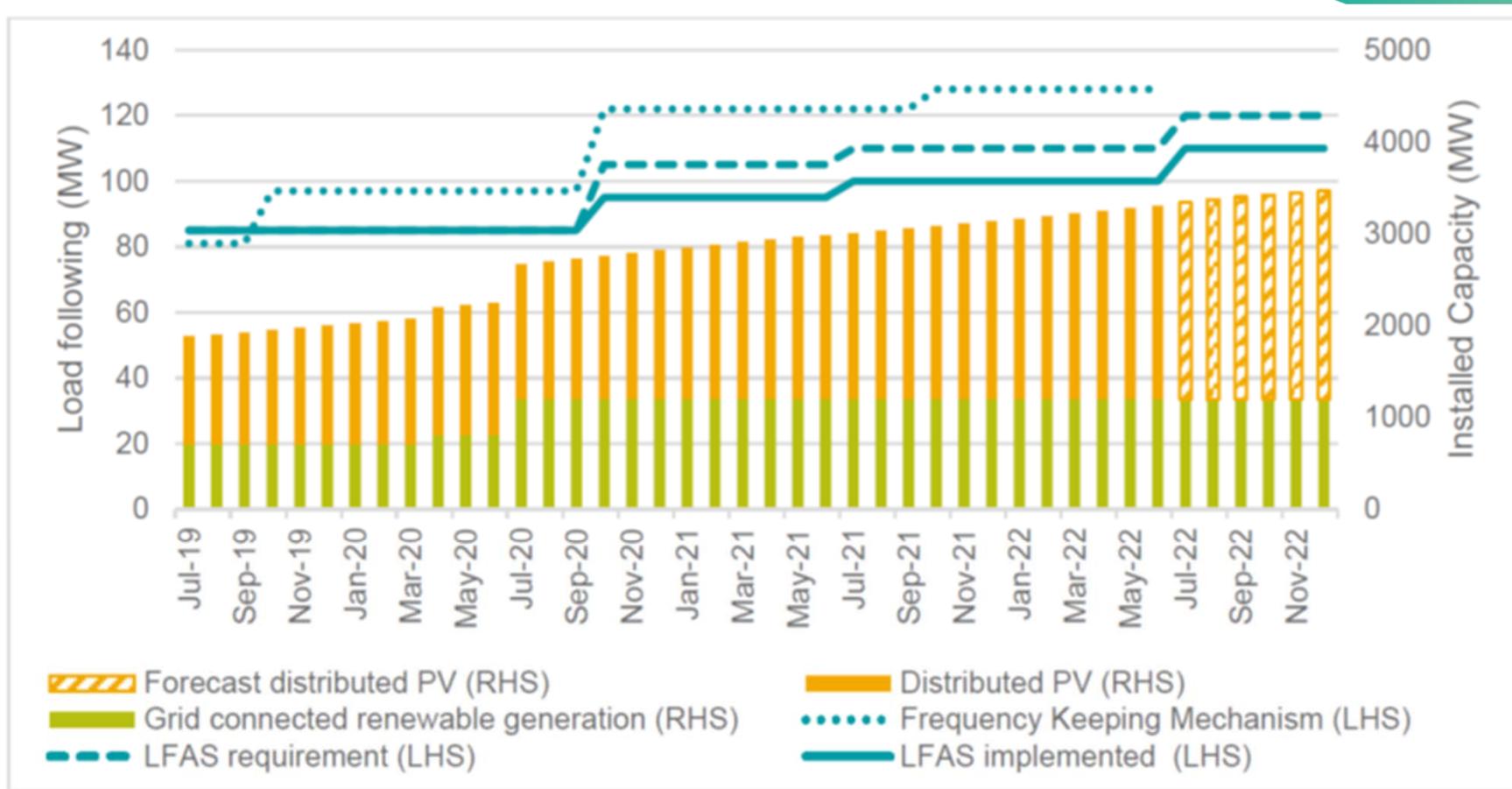
(a) ERA, Decision on the AEMO's 2022/23 ancillary services requirements, 27 June 2022, p. 14

# LFAS Requirements Have Increased Substantially

| Year                    | Peak LFAS requirement (MW) | Peak LFAS implemented by AEMO (MW) | Off Peak LFAS requirement (MW) | Off Peak LFAS implemented by AEMO (MW) | Price Periods  |
|-------------------------|----------------------------|------------------------------------|--------------------------------|--|--|
| 2018-19                 | 72                         | NA                                 | 72                             | NA                                     | <ul style="list-style-type: none"> <li>Constant across all time periods</li> </ul>   |
| August 2019 - Sept 2020 | 85                         | 85                                 | 50                             | 50                                     | <ul style="list-style-type: none"> <li>Peak Period between 5:30am and 7:30pm</li> <li>Off Peak Period between 7:30pm and 5:30am</li> </ul>   |
| Sept 2020 – July 2021   | 105                        | 95                                 | 70                             | 70                                     | <ul style="list-style-type: none"> <li>Peak Period between 5:30am and 7:30pm</li> <li>Off Peak Period between 7:30pm and 5.30 AM.</li> </ul> |
| July 2021- June 2022    | 110                        | 100                                | 65                             | 65                                     | <ul style="list-style-type: none"> <li>Peak Period between 5:30am and 8:30pm</li> <li>Off Peak Period between 8:30pm and 5.30am</li> </ul>   |
| July 2022 - Dec 2022    | 110                        | 110                                | 65                             | NA                                     | <ul style="list-style-type: none"> <li>Peak Period between 5:30am and 8:30pm</li> <li>Off Peak Period between 8:30pm and 5:30am</li> </ul>   |

Source: AEMO, Ancillary Service Reports

# Peak LFAS Requirements and VRE Capacity in the SWIS



Source: ERA, Decision on the AEMO's 2022/23 ancillary services requirements, 27 June 2022, p. 11.

## Cost Estimates for Peak Frequency Regulation Requirements

| Year    | Peak Frequency Regulation Requirements (MW) | Annual Cost (\$ millions) | Annual Cost Increase (\$ millions) | Cumulative Cost Increase (\$ millions) |
|---------|---|---------------------------|------------------------------------|--|
| 2021-22 | 99  | 35.17                     |                                    |  |
| 2022-23 | 110   | 39.26                     | 4.09                               | 4.09                                   |
| 2023-24 | 120   | 42.82                     | 3.57                               | 7.66                                   |
| 2024-25 | 140   | 49.96                     | 7.14                               | 14.80                                  |
| 2025-26 | 170   | 60.67                     | 10.71                              | 25.50                                  |
| 2026-27 | 220   | 78.51                     | 17.84                              | 43.34                                  |

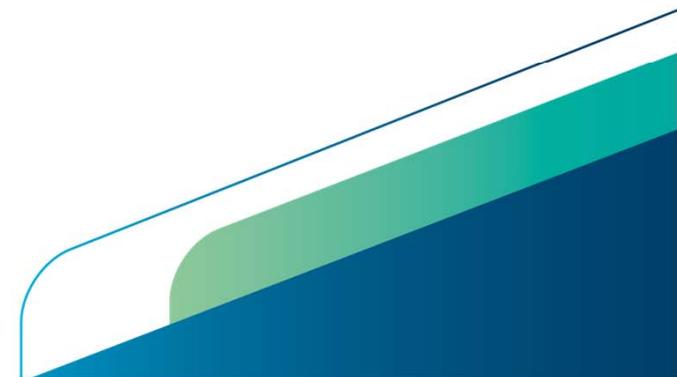
- Marsden Jacob estimated future Peak Frequency Regulation Requirements given the increase in the amount of VRE capacity that will connect to the SWIS by 2026-27
- Using average LFAS Up and LFAS Down prices in the 2021/22 year (April 2021 to March 2022), Marsden Jacob calculated the annual cost increase due to increased future Peak Frequency Regulation Requirements
- This is based on average costs, so these estimates will be below the incremental cost estimates calculated by the ERA and AEMO (refer to Slide 12)

## Potential Benefits of WEM Causer Pays

- Adopting a causer-pays Frequency Regulation cost allocation mechanism may help reduce the requirements for Regulation services
- A causer-pays cost allocation method would typically measure deviations between forecast output (or dispatch targets) and actual output (assuming these deviations can cause frequency deviations) and allocate more of the Regulation costs to Facilities with higher deviations
- This could provide Facilities with incentives to minimise deviations:
  - Scheduled Facilities and Semi-Scheduled Facilities providing ESS must follow dispatch targets in the new market and could be penalised if they deviate from the target over the 5-minute dispatch interval
  - Semi-Scheduled Facilities could provide more accurate forecasts of generation (considering weather related factors), which helps to minimise forecast errors and regulation requirements
  - Semi-Scheduled Facilities could minimise variations in generation by installing onsite storage

# Technology is Available to Improve VRE Forecasting

- Projects have demonstrated the potential for reducing future Regulation costs:
  - ARENA funded Proa Solar Farm Short Term Forecasting Project has demonstrated how better forecasting has substantially reduced causer pays factors for Kidston Solar Project (KSP) from of 0.383 to 0.200 (average over 5 months)
  - This represents a 52% reduction in Regulation costs  
(<https://arena.gov.au/assets/2020/07/proa-analytics-solar-forecasting-lessons-learnt-report-2.pdf>)
  - Better short-term solar forecasting also has the potential to reduce FCAS requirements



## 2(b) Contingency Reserve Lower – Amended Allocation Method

# Previous Proposal: Contingency Reserve Lower

- At the 21 March 2023 CARWG meeting, EPWA proposed using the Runway Method to allocate the Contingency Reserve Lower (CRL) cost above a 120 MW threshold
- The CARWG raised concerns with this proposal:
  - Almost 50% of CRL costs in a trading interval may be borne by the largest BESS
  - A full causer-pays cost allocation under the runway method could result in the initial BESS's paying up to 60% - 70% of CRL costs when recharging
  - This would place a significant cost burden on BESS systems
  - BESS are needed to “firm” up VRE to replace retiring coal plant in the SWIS
  - Information from the NEM suggested that the probability of a BESS Facility having a forced outage is low (<https://arena.gov.au/knowledge-bank/lake-bonney-operational-report-2/>)
  - The most likely cause of a BESS outage is a transmission asset outage, not a BESS outage
  - It is only feasible to locate grid connected BESS in the Kwinana industrial precinct or Muja region (there are significant network constraints in all other regions of the SWIS)
  - BESS could share transmission assets but this could significantly increase the network risk and increase in CRL requirements (e.g. to 400 MW)

# Discussion of Options

- The CARWG identified an option to set the CRL requirements based only on the network risk (instead of separately allocating facility and network risk)
  - A focus on the network risk reflects the likelihood of a network outage impacting a BESS/large load, not a facility outage (which is a low likelihood for a BESS)
- EPWA and AEMO discussed this option – AEMO indicated that:
  - While the facility risk for a grid connected BESS is low, the risk exists and cannot be ignored when setting CRL requirements – AEMO will factor in both facility and network risks
    - Setting the overall CRL requirement on both the network and facility risks would be misaligned with the proposal
  - This proposal ignores non-BESS facilities that may be above 120 MW and could have a material facility risk
    - EPWA indicated that, while this option is not perfectly aligned with the causer-pays principle, implementing an arrangement that fully aligns may be cost prohibitive



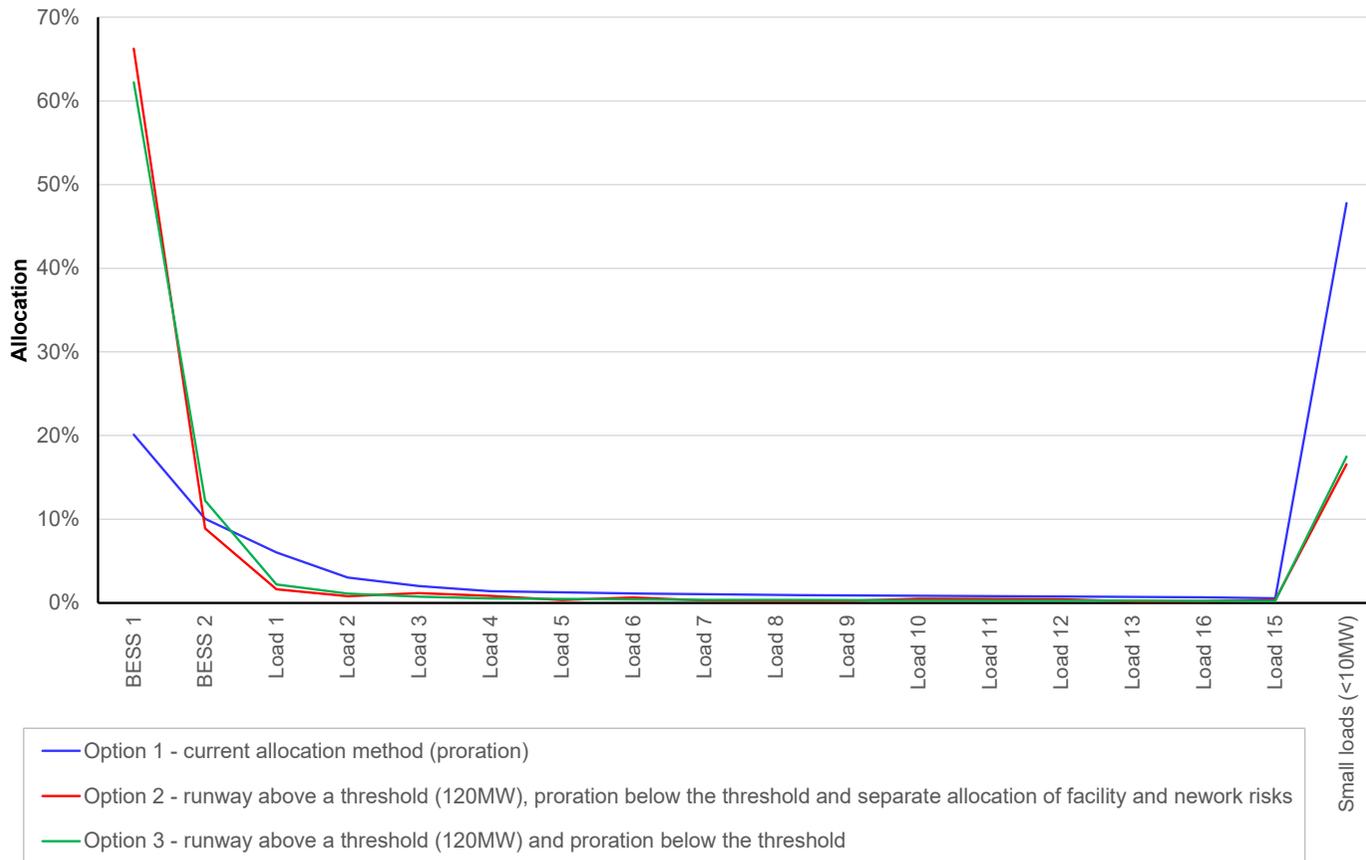
# Analysis of CRL Cost Recovery Options

- Modelling has been done of CRL cost allocations for new facilities under three cost recovery options:
  - Option 1 – proration (the current cost recovery method)
  - Option 2 – apply the runway method above 120 MW and proration below 120 MW, and separately allocate facility and network risks (the option presented to the CARWG on 21 March 2023)
  - Option 3 – apply the runway method above 120 MW and proration below 120 MW, but only allocating according to the facility risk (the option identified by CARWG on 21 March 2023)
- The modelling was done for two scenarios:
  - Scenario 1 – Entry of a 400 MW and a 200 MW BESS on separate networks
  - Scenario 2 – Entry of a 400 MW on one network and two 200 MW BESSs on another
- Other assumptions:
  - 15 large commercial loads between 11 MW and 120 MW are modelled separately
  - Small loads (<10MW each) are aggregated to 950 MW
  - Two networks with the large commercial loads distributed randomly across the two networks and half of the small loads on each network



# Scenario 1

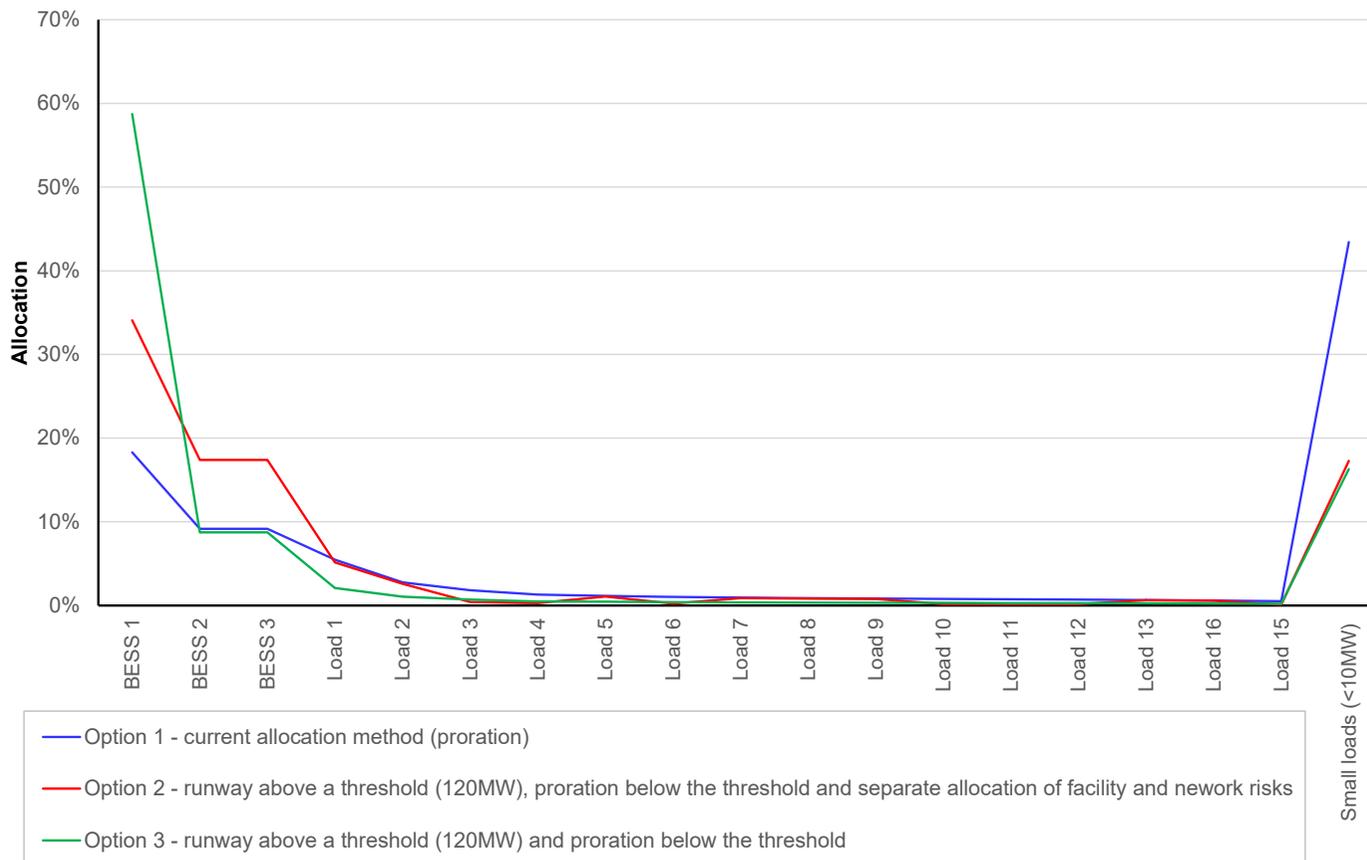
Contingency Reserve Lower Cost Allocation Options - Scenario 1



- Option 1:
  - BESS 1 allocated 20.1%
  - BESS 2 allocated 10.1%
- Option 2:
  - BESS 1 allocated 66.2%
  - BESS 2 allocated 8.9%
- Option 3:
  - BESS 1 allocated 62.2%
  - BESS 2 allocated 12.2%
- When the BESS are charging, CRL Requirement = 549MW, set by Network 1
- Options 2 and 3 yield similar results

# Scenario 2

Contingency Reserve Lower Cost Allocation Options - Scenario 2



- Option 1:
  - BESS 1 allocated 18.3%
  - BESS 2 and 3 each allocated 9.1%
- Option 2:
  - BESS 1 allocated 34.1%
  - BESS 2 and 3 each allocated 17.4%
- Option 3:
  - BESS 1 allocated 58.7%
  - BESS 2 and 3 each allocated 8.7%
- When the BESS are charging, CRL Requirement = 549 MW, set by Network 2

# Implications of CRL Modelling and Final Design

- Options 2 and 3 yield significantly higher cost allocations to large loads compared to the current cost allocation method (Option 1)
  - This is consistent with the causer-pays principle, whereby large loads (e.g. BESS) that connect pay for the increase in CRL service requirements that they cause
- Options 2 and 3 yield similar cost allocation if BESS are located on separate transmission elements
- Options 2 and 3 yield very different results if BESS are located on the same transmission element
  - Under Option 3, BESS that is located on one network can cross-subsidise CRL costs for BESS on another network – this is not consistent with the causer-pays principle or economic efficiency
- EPWA proposes that Option 2 be adopted for implementation by October 2025, consistent with the recommendation in the Cost Allocation Review Consultation Paper
- **Does the CARWG have any specific objections to this approach?**



## 2(c) Market Fees – ESR Cost Recovery

## Market Fees – ESR Cost Recovery

- It was proposed that ESR (including in hybrid facilities) should be charged Market Fees based only on gross exports to the grid (equivalent to generation sent out), not based on both gross imports (recharging) and gross exports (discharging)
- Most CARWG members supported this proposal, but AEMO had the following concerns:
  - This may be costly to implement (i.e. it would lead to sentiment changes for market fees)
  - As the current billing determinants are injection and withdrawal at the node, reducing load by carving out ESR recharge puts a greater burden on other market participants
  - It would be difficult to identify the BESS recharging for a hybrid facility that has load, generation and ESR behind the meter
  - This would lead to inconsistency between the treatment of generation facilities (which can be net importers of energy for some trading intervals) and ESR
    - Generation facilities are charged Market Fees for any consumption incurred during their synchronisation, or periods of consumption when not operating/undertaking repairs, or when creating inertia by consuming energy to spin the turbines
- EPWA now proposes to not exclude ESR withdrawal quantities from the Market Fees cost allocation for ESR
- **Does the CARWG have any specific objections to this approach?**

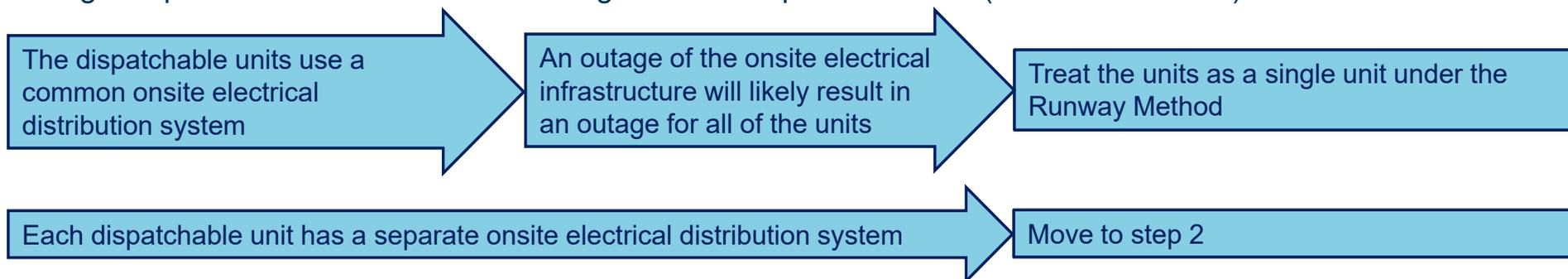


## 2(d) Contingency Reserve Raise – Treatment of Facilities with Multiple Connections under the Runway Method

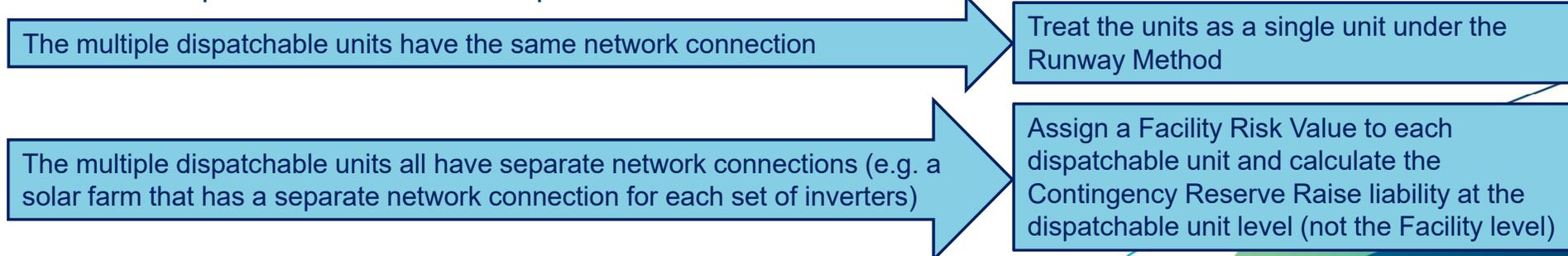
# Method for Determining Facility Risk Value

- AEMO to assess whether the multiple dispatchable units at a Facility are likely to have a simultaneous outage using the following steps:

- Does each dispatchable unit (or set of inverters) have its own onsite electrical distribution system, which includes having a separate switchboard and metering for each dispatchable unit (or set of inverters)?



- Does each dispatchable unit have a separate network connection?



## Issues Raised by AEMO

- AEMO agrees that it should have discretion to establish criteria for how to determine when to separately treat facilities with multiple connections for allocation of Contingency Reserve Raise costs and the method for making this determination should be included in a WEM Procedure
  - it is proposed to amend the WEM Rules to require AEMO to include this assessment in the relevant WEM Procedure
- While AEMO agrees that facilities with units that have separate connection points may represent a lower risk, the proposed approach of separately treating each unit within a Facility would require substantial changes to the registration framework to allow for cost recovery from multiple components of a single Facility
- AEMO has indicated that there does not appear to be a case for implementing this change at the moment given the absence of aggregated facilities
- Subject to AEMO confirming that currently there is no facility in the WEM that would benefit from this change, EPWA proposes that the WEM Rules be amended to require AEMO to develop WEM Procedure as part of the implementation of the rest of the proposed cost allocation changes
- **Does the CARWG have any specific objections to this approach**

# 3. Next Steps



## Next Steps

- Draft the Information Paper
- Present the final design and the draft Information Paper to the MAC on 8 June 2023
- Finalise and publish the Information Paper
- Draft the Amending Rules (timing TBD)
- Commencement (consistent with timing for 5-minute settlement)