



Meeting Agenda

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|------------------------|---|
| Meeting Title: | Reserve Capacity Mechanism Review Working Group (RCMRWG) |
| Meeting Number: | 2023_03_22 |
| Date: | Wednesday 22 March 2023 |
| Time: | 9:30 AM to 11:00 AM |
| Location: | 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_02 | Chair | Decision | 2 min |
| 4 | Action Items | Chair | Discussion | 2 min |
| 5 | Flexible Capacity – Additional Considerations | RBP | Discussion | 40 min |
| 6 | Penalties on High Emission Technologies | RBP | Discussion | 15 min |
| 7 | Outages and Refunds | RBP | Discussion | 5 min |
| 8 | Next Steps | Chair | Discussion | 5 min |
| 9 | General Business | Chair | Discussion | 2 min |

Please note this meeting will be recorded.

Competition and Consumer Law Obligations

Members of the MAC's Reserve Capacity Mechanism 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 MAC's Reserve Capacity Mechanism 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.



Agenda Item 4: RCMRWG Action Items

Reserve Capacity Mechanism Review Working Group (RCMRWG) Meeting 2023_03_22

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| 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 |
|------|---|--------------------|-----------------|--|
| 18 | RCMRWG Secretariat to publish the minutes of the 16 February 2023 RCMRWG meeting on the RCMRWG web page as final. | RCMRWG Secretariat | 2023_02_16 | Closed Minutes published 2 March 2023 |



Government of Western Australia
Energy Policy WA

Reserve Capacity Mechanism Review Working Group Meeting 2023_03_22

22 March 2023

Working together for a
brighter energy future.

Meeting Protocols

- Please place your microphone on mute, unless you are asking a question or making a comment
- Please keep questions relevant to the agenda item being discussed
- If there is not a break in discussion and you would like to say something, you can 'raise your hand' by typing 'question' or 'comment' in the meeting chat
- Questions and comments can also be emailed to EPWA - Energy Markets energymarkets@dmirs.wa.gov.au after the meeting
- The meeting will be recorded and minutes will be taken (actions and recommendations only)
- Please state your name and organisation when you ask a question
- If you are having connection/bandwidth issues, you may want to disable the incoming and/or outgoing video

Agenda

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5. Flexible Capacity – Additional Considerations

Flexible Capacity

To date, the RCM Review project has covered:

- The need for a flexible capacity product to supplement the existing peak capacity product
- The method of setting the target for the new product
- The method for setting the price paid to facilities for providing flexible capacity
- The approach to determining the flexible IRCR

The slides below cover:

- Key factors for certification of facilities to provide flexible capacity
- Obligations for holders of flexible capacity credits
- Amendments to the outage regime to account for flexible capacity
- Approach to refunds for failure to meet those obligations

Dispatch

- Under the forthcoming Real-Time Market rules, there is no specific service for fast-ramping facilities
- Facilities will be dispatched for energy by the security constrained economic dispatch engine, which accounts for ramp constraints and start-up times
- As long as sufficient flexible capacity is available, the dispatch engine will be able to use it when needed (e.g. if the load in the middle of the day is such that more generation is required than is currently synchronised, the engine will dispatch a fast start facility)
- In the SWIS, fast ramping facilities are currently more expensive than slower ramping ones, meaning they will effectively be held in reserve unless needed
 - If slow ramping facilities ever became more expensive than fast ramping facilities, it would be possible for the dispatch engine to dispatch a faster facility ahead of a slower one, and then not have sufficient ramping capability available in a later period
 - This risk could be removed by implementing a dedicated ramping service, but doing so would require inter-temporal optimisation, whereby the clearing engine optimises dispatch costs over multiple intervals, rather than sequentially interval-by-interval, as at present
 - This would require major changes to the dispatch algorithm, and is not necessary at this time. If, in future, centralised commitment is implemented, a ramping service could be implemented at the same time

Timing of Maximum Ramp (1)

- It is generally around 4 hours from the end of the midday trough to the peak
- The four days with the highest 4-hour ramp quantities all occur between June and September in all years from 2015-2021
- Until capacity year 2016, some of the highest 4-hour ramps were observed in the morning. Since 2017, they all occur in the lead up to the evening peak



| Hours making up the highest ramp requirement | | | | | | | |
|--|------|------|------|------|------|------|------|
| Time of the day/Capacity year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
| 3:30 am | 2 | 1 | | | | | |
| 4:00 am | 2 | 1 | | | | | |
| 4:30 am | 2 | 1 | | | | | |
| 5:00 am | 2 | 1 | | | | | |
| 5:30 am | 2 | 1 | | | | | |
| 6:00 am | 2 | 1 | | | | | |
| 6:30 am | 2 | 1 | | | | | |
| 7:00 am | 2 | 1 | | | | | |
| 7:30 am | 2 | 1 | | | | | |
| 2:00 pm | 1 | 1 | 1 | 4 | 3 | 2 | 2 |
| 2:30 pm | 2 | 3 | 4 | 4 | 4 | 4 | 4 |
| 3:00 pm | 2 | 3 | 4 | 4 | 4 | 4 | 4 |
| 3:30 pm | 2 | 3 | 4 | 4 | 4 | 4 | 4 |
| 4:00 pm | 2 | 3 | 4 | 4 | 4 | 4 | 4 |
| 4:30 pm | 2 | 3 | 4 | 4 | 4 | 4 | 4 |
| 5:00 pm | 2 | 3 | 4 | 4 | 4 | 4 | 4 |
| 5:30 pm | 2 | 3 | 4 | 4 | 4 | 4 | 4 |
| 6:00 pm | 2 | 3 | 4 | 4 | 4 | 4 | 4 |
| 6:30 pm | 1 | 2 | 3 | | 1 | 2 | 2 |

Timing of Maximum Ramp (2)

| Capacity year 2015 | | | Capacity year 2016 | | | Capacity year 2017 | | |
|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Date time | Total Sent Out (MW) | 4 hr ramp rate (MW) | Date time | Total Sent Out (MW) | 4 hr ramp rate (MW) | Date time | Total Sent Out (MW) | 4 hr ramp rate (MW) |
| 2016-07-13 14:00:00 | 2169.0 | | 2017-07-09 14:00:00 | 1772.1 | | 2018-07-08 14:00:00 | 1522.2 | |
| 2016-07-13 14:30:00 | 2199.1 | | 2017-07-09 14:30:00 | 1846.3 | | 2018-07-08 14:30:00 | 1574.6 | |
| 2016-07-13 15:00:00 | 2258.0 | | 2017-07-09 15:00:00 | 1941.8 | | 2018-07-08 15:00:00 | 1651.9 | |
| 2016-07-13 15:30:00 | 2324.3 | | 2017-07-09 15:30:00 | 2044.2 | | 2018-07-08 15:30:00 | 1757.3 | |
| 2016-07-13 16:00:00 | 2423.6 | | 2017-07-09 16:00:00 | 2192.0 | | 2018-07-08 16:00:00 | 1901.5 | |
| 2016-07-13 16:30:00 | 2583.1 | | 2017-07-09 16:30:00 | 2350.9 | | 2018-07-08 16:30:00 | 2070.3 | |
| 2016-07-13 17:00:00 | 2816.2 | | 2017-07-09 17:00:00 | 2545.7 | | 2018-07-08 17:00:00 | 2278.2 | |
| 2016-07-13 17:30:00 | 3098.1 | | 2017-07-09 17:30:00 | 2784.3 | | 2018-07-08 17:30:00 | 2525.5 | |
| 2016-07-13 18:00:00 | 3272.6 | 1103.5 | 2017-07-09 18:00:00 | 2865.4 | 1093.3 | 2018-07-08 18:00:00 | 2652.6 | 1130.4 |
| 2016-07-24 14:30:00 | 1955.5 | | 2017-08-02 14:30:00 | 2196.1 | | 2018-08-11 14:30:00 | 1675.4 | |
| 2016-07-24 15:00:00 | 2022.1 | | 2017-08-02 15:00:00 | 2233.6 | | 2018-08-11 15:00:00 | 1742.7 | |
| 2016-07-24 15:30:00 | 2117.7 | | 2017-08-02 15:30:00 | 2323.4 | | 2018-08-11 15:30:00 | 1850.5 | |
| 2016-07-24 16:00:00 | 2256.8 | | 2017-08-02 16:00:00 | 2448.7 | | 2018-08-11 16:00:00 | 1984.8 | |
| 2016-07-24 16:30:00 | 2445.5 | | 2017-08-02 16:30:00 | 2611.0 | | 2018-08-11 16:30:00 | 2149.7 | |
| 2016-07-24 17:00:00 | 2681.4 | | 2017-08-02 17:00:00 | 2814.7 | | 2018-08-11 17:00:00 | 2348.9 | |
| 2016-07-24 17:30:00 | 2934.9 | | 2017-08-02 17:30:00 | 3082.7 | | 2018-08-11 17:30:00 | 2609.0 | |
| 2016-07-24 18:00:00 | 3081.2 | | 2017-08-02 18:00:00 | 3288.0 | | 2018-08-11 18:00:00 | 2824.5 | |
| 2016-07-24 18:30:00 | 3086.8 | 1131.3 | 2017-08-02 18:30:00 | 3329.4 | 1133.4 | 2018-08-11 18:30:00 | 2876.0 | 1200.6 |
| 2016-07-26 03:30:00 | 1657.0 | | 2017-08-03 03:30:00 | 1892.2 | | 2018-08-12 14:30:00 | 1533.6 | |
| 2016-07-26 04:00:00 | 1683.8 | | 2017-08-03 04:00:00 | 1914.0 | | 2018-08-12 15:00:00 | 1616.1 | |
| 2016-07-26 04:30:00 | 1725.3 | | 2017-08-03 04:30:00 | 1960.0 | | 2018-08-12 15:30:00 | 1721.3 | |
| 2016-07-26 05:00:00 | 1840.3 | | 2017-08-03 05:00:00 | 2069.4 | | 2018-08-12 16:00:00 | 1858.4 | |
| 2016-07-26 05:30:00 | 1990.5 | | 2017-08-03 05:30:00 | 2199.9 | | 2018-08-12 16:30:00 | 2031.8 | |
| 2016-07-26 06:00:00 | 2239.5 | | 2017-08-03 06:00:00 | 2432.3 | | 2018-08-12 17:00:00 | 2236.2 | |
| 2016-07-26 06:30:00 | 2485.3 | | 2017-08-03 06:30:00 | 2645.5 | | 2018-08-12 17:30:00 | 2477.7 | |
| 2016-07-26 07:00:00 | 2728.5 | | 2017-08-03 07:00:00 | 2871.4 | | 2018-08-12 18:00:00 | 2694.9 | |
| 2016-07-26 07:30:00 | 2816.6 | 1159.7 | 2017-08-03 07:30:00 | 2980.5 | 1088.4 | 2018-08-12 18:30:00 | 2768.1 | 1234.6 |
| 2016-08-02 03:30:00 | 1752.5 | | 2017-08-10 14:30:00 | 2094.7 | | 2018-09-15 14:30:00 | 1388.0 | |
| 2016-08-02 04:00:00 | 1770.7 | | 2017-08-10 15:00:00 | 2124.2 | | 2018-09-15 15:00:00 | 1458.4 | |
| 2016-08-02 04:30:00 | 1819.0 | | 2017-08-10 15:30:00 | 2199.1 | | 2018-09-15 15:30:00 | 1550.5 | |
| 2016-08-02 05:00:00 | 1929.7 | | 2017-08-10 16:00:00 | 2309.5 | | 2018-09-15 16:00:00 | 1667.7 | |
| 2016-08-02 05:30:00 | 2062.7 | | 2017-08-10 16:30:00 | 2430.2 | | 2018-09-15 16:30:00 | 1821.0 | |
| 2016-08-02 06:00:00 | 2319.3 | | 2017-08-10 17:00:00 | 2601.7 | | 2018-09-15 17:00:00 | 2008.7 | |
| 2016-08-02 06:30:00 | 2586.6 | | 2017-08-10 17:30:00 | 2858.3 | | 2018-09-15 17:30:00 | 2200.9 | |
| 2016-08-02 07:00:00 | 2833.7 | | 2017-08-10 18:00:00 | 3098.7 | | 2018-09-15 18:00:00 | 2378.5 | |
| 2016-08-02 07:30:00 | 2903.2 | 1150.7 | 2017-08-10 18:30:00 | 3168.7 | 1074.0 | 2018-09-15 18:30:00 | 2513.1 | 1125.1 |

- The interval with the highest ramp in each 4 hr period is shown with the total sent out MW highlighted in red
- The ramp rate (MW) is the difference between the total sent out between the first and the last interval of the 4 hr period
- The TIs in red font are high ramp periods experienced in the morning

Timing of Maximum Ramp (3)

| Capacity year 2018 | | | Capacity year 2019 | | | Capacity year 2020 | | | Capacity year 2021 | | |
|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Date time | Total Sent Out (MW) | 4 hr ramp rate (MW) | Date time | Total Sent Out (MW) | 4 hr ramp rate (MW) | Date time | Total Sent Out (MW) | 4 hr ramp rate (MW) | Date time | Total Sent Out (MW) | 4 hr ramp rate (MW) |
| 2019-06-18 14:00:00 | 1936.1 | | 2020-07-10 14:00:00 | 1740.7 | | 2021-06-24 14:00:00 | 1881.2 | | 2022-07-03 14:00:00 | 1288.6 | |
| 2019-06-18 14:30:00 | 1976.2 | | 2020-07-10 14:30:00 | 1801.2 | | 2021-06-24 14:30:00 | 1950.0 | | 2022-07-03 14:30:00 | 1384.9 | |
| 2019-06-18 15:00:00 | 2048.8 | | 2020-07-10 15:00:00 | 1908.5 | | 2021-06-24 15:00:00 | 2065.2 | | 2022-07-03 15:00:00 | 1514.8 | |
| 2019-06-18 15:30:00 | 2163.6 | | 2020-07-10 15:30:00 | 2041.2 | | 2021-06-24 15:30:00 | 2236.7 | | 2022-07-03 15:30:00 | 1712.8 | |
| 2019-06-18 16:00:00 | 2312.6 | | 2020-07-10 16:00:00 | 2202.3 | | 2021-06-24 16:00:00 | 2426.7 | | 2022-07-03 16:00:00 | 1948.2 | |
| 2019-06-18 16:30:00 | 2508.8 | | 2020-07-10 16:30:00 | 2426.0 | | 2021-06-24 16:30:00 | 2683.1 | | 2022-07-03 16:30:00 | 2244.7 | |
| 2019-06-18 17:00:00 | 2739.2 | | 2020-07-10 17:00:00 | 2660.7 | | 2021-06-24 17:00:00 | 2985.6 | | 2022-07-03 17:00:00 | 2525.0 | |
| 2019-06-18 17:30:00 | 3011.6 | | 2020-07-10 17:30:00 | 2913.3 | | 2021-06-24 17:30:00 | 3268.2 | | 2022-07-03 17:30:00 | 2749.7 | |
| 2019-06-18 18:00:00 | 3116.7 | 1180.6 | 2020-07-10 18:00:00 | 3040.0 | 1299.3 | 2021-06-24 18:00:00 | 3391.4 | 1510.2 | 2022-07-03 18:00:00 | 2875.2 | 1586.6 |
| 2019-06-19 14:00:00 | 1912.5 | | 2020-07-11 14:00:00 | 1471.0 | | 2021-06-26 14:00:00 | 1473.4 | | 2022-08-07 14:00:00 | 1310.7 | |
| 2019-06-19 14:30:00 | 1970.7 | | 2020-07-11 14:30:00 | 1535.1 | | 2021-06-26 14:30:00 | 1571.0 | | 2022-08-07 14:30:00 | 1412.3 | |
| 2019-06-19 15:00:00 | 2040.7 | | 2020-07-11 15:00:00 | 1627.6 | | 2021-06-26 15:00:00 | 1708.5 | | 2022-08-07 15:00:00 | 1582.6 | |
| 2019-06-19 15:30:00 | 2159.2 | | 2020-07-11 15:30:00 | 1771.2 | | 2021-06-26 15:30:00 | 1875.2 | | 2022-08-07 15:30:00 | 1799.6 | |
| 2019-06-19 16:00:00 | 2300.6 | | 2020-07-11 16:00:00 | 1967.7 | | 2021-06-26 16:00:00 | 2097.1 | | 2022-08-07 16:00:00 | 1991.5 | |
| 2019-06-19 16:30:00 | 2515.1 | | 2020-07-11 16:30:00 | 2210.7 | | 2021-06-26 16:30:00 | 2351.8 | | 2022-08-07 16:30:00 | 2225.8 | |
| 2019-06-19 17:00:00 | 2765.1 | | 2020-07-11 17:00:00 | 2468.5 | | 2021-06-26 17:00:00 | 2626.3 | | 2022-08-07 17:00:00 | 2460.3 | |
| 2019-06-19 17:30:00 | 3020.9 | | 2020-07-11 17:30:00 | 2705.4 | | 2021-06-26 17:30:00 | 2879.7 | | 2022-08-07 17:30:00 | 2705.1 | |
| 2019-06-19 18:00:00 | 3124.3 | 1211.8 | 2020-07-11 18:00:00 | 2819.9 | 1348.9 | 2021-06-26 18:00:00 | 2977.7 | 1504.4 | 2022-08-07 18:00:00 | 2850.5 | 1539.8 |
| 2019-07-07 14:00:00 | 1480.6 | | 2020-07-12 14:00:00 | 1351.1 | | 2021-09-04 14:30:00 | 1154.9 | | 2022-08-22 14:30:00 | 1420.8 | |
| 2019-07-07 14:30:00 | 1560.8 | | 2020-07-12 14:30:00 | 1436.6 | | 2021-09-04 15:00:00 | 1248.4 | | 2022-08-22 15:00:00 | 1539.8 | |
| 2019-07-07 15:00:00 | 1669.0 | | 2020-07-12 15:00:00 | 1541.6 | | 2021-09-04 15:30:00 | 1416.8 | | 2022-08-22 15:30:00 | 1700.8 | |
| 2019-07-07 15:30:00 | 1791.9 | | 2020-07-12 15:30:00 | 1680.6 | | 2021-09-04 16:00:00 | 1602.9 | | 2022-08-22 16:00:00 | 1921.1 | |
| 2019-07-07 16:00:00 | 1948.5 | | 2020-07-12 16:00:00 | 1857.4 | | 2021-09-04 16:30:00 | 1815.3 | | 2022-08-22 16:30:00 | 2178.2 | |
| 2019-07-07 16:30:00 | 2115.4 | | 2020-07-12 16:30:00 | 2095.0 | | 2021-09-04 17:00:00 | 2081.1 | | 2022-08-22 17:00:00 | 2460.1 | |
| 2019-07-07 17:00:00 | 2341.1 | | 2020-07-12 17:00:00 | 2335.3 | | 2021-09-04 17:30:00 | 2335.9 | | 2022-08-22 17:30:00 | 2762.3 | |
| 2019-07-07 17:30:00 | 2576.9 | | 2020-07-12 17:30:00 | 2571.1 | | 2021-09-04 18:00:00 | 2533.5 | | 2022-08-22 18:00:00 | 2986.0 | |
| 2019-07-07 18:00:00 | 2679.5 | 1198.8 | 2020-07-12 18:00:00 | 2696.3 | 1345.2 | 2021-09-04 18:30:00 | 2649.2 | 1494.3 | 2022-08-22 18:30:00 | 3080.6 | 1659.9 |
| 2019-07-14 14:00:00 | 1419.0 | | 2020-08-30 14:30:00 | 1207.6 | | 2021-09-12 14:30:00 | 1046.4 | | 2022-08-23 14:30:00 | 1618.6 | |
| 2019-07-14 14:30:00 | 1487.8 | | 2020-08-30 15:00:00 | 1315.0 | | 2021-09-12 15:00:00 | 1168.3 | | 2022-08-23 15:00:00 | 1742.5 | |
| 2019-07-14 15:00:00 | 1597.5 | | 2020-08-30 15:30:00 | 1436.1 | | 2021-09-12 15:30:00 | 1329.4 | | 2022-08-23 15:30:00 | 1866.1 | |
| 2019-07-14 15:30:00 | 1712.4 | | 2020-08-30 16:00:00 | 1631.2 | | 2021-09-12 16:00:00 | 1502.9 | | 2022-08-23 16:00:00 | 2087.6 | |
| 2019-07-14 16:00:00 | 1878.3 | | 2020-08-30 16:30:00 | 1831.1 | | 2021-09-12 16:30:00 | 1742.8 | | 2022-08-23 16:30:00 | 2319.9 | |
| 2019-07-14 16:30:00 | 2070.3 | | 2020-08-30 17:00:00 | 2026.8 | | 2021-09-12 17:00:00 | 1990.5 | | 2022-08-23 17:00:00 | 2590.5 | |
| 2019-07-14 17:00:00 | 2302.8 | | 2020-08-30 17:30:00 | 2232.3 | | 2021-09-12 17:30:00 | 2243.8 | | 2022-08-23 17:30:00 | 2889.0 | |
| 2019-07-14 17:30:00 | 2556.0 | | 2020-08-30 18:00:00 | 2415.2 | | 2021-09-12 18:00:00 | 2448.8 | | 2022-08-23 18:00:00 | 3103.7 | |
| 2019-07-14 18:00:00 | 2702.2 | 1283.2 | 2020-08-30 18:30:00 | 2500.6 | 1293.0 | 2021-09-12 18:30:00 | 2571.8 | 1525.4 | 2022-08-23 18:30:00 | 3165.5 | 1546.9 |

Flex IRCR – Adjusted Proposed Method

Adjusted method to ensure selection of largest ramp period

1. For each day in the previous capacity year:
 - a. Find the difference between the operational load at the end of each trading interval and the load at the end of the trading interval four hours prior
 - b. Select the trading interval with the highest change in load and the seven prior intervals
2. Find the three days with the highest total difference in MW in step 1a

This method also identifies intervals in the morning ramp until 2016 but avoids the issue if the largest single-interval ramp of the day is not within the largest 4-hour ramp of the day

Flexible Capacity Certification - Proposal

Flexible capacity certification would be incorporated into the existing certification timelines

The quantity of flexible CRC allocated to a facility would be capped at:

- its peak CRC (a MW could not be certified for flexible capacity only)
- its NAQ (as it is conceivable for the end of the maximum ramp period to coincide with the annual peak demand)
- the maximum MW quantity that it could reach four hours after being dispatched from an unsynchronized state

Minimum performance requirements for CRC is likely to need to change over time as the load shape evolves. The rules would require AEMO to consider the characteristics of the need to be met, ensuring that flexible facilities are able to move quickly from no output (or consumption) in the midday trough, to rapidly increase output as the ramp begins

Maximum standards would be required for:

- Minimum stable loading level, for example starting at 5% of nameplate or less, and moving to zero as midday load reduces
- Start time (time from receiving a dispatch instruction when unsynchronized to reaching its controllable range), for example 30 minutes, and reducing as the ramp gets steeper
- Minimum running time (time from receiving a dispatch instruction when unsynchronised to turn on, run, and turn off again), for example of 4 hours to match the expected ramp timing
- Stop time (time from receiving a dispatch instruction when running at the minimum of its controllable range to ramp down to zero output), for example 30 minutes, so as to be able to quickly respond to increasing PV in the morning
- Restart time (time from desynchronising to synchronizing), for example sufficient to cycle at least twice daily

Capacity Obligations – Proposal

Holders of peak capacity credits are obliged to:

- Participate in outage planning processes
- Comply with reserve capacity testing requirements
- Offer their capacity into the STEM and Real-Time Markets

Holders of flexible capacity credits would still be required to do these things, with some additional obligations for outage planning and capacity testing, to reflect the nature of the flexible capacity product

Outages – Proposal

When a MW of capacity is on outage for peak capacity, it will necessarily be on outage for flexible capacity as well. The current outage regime can be applied as is to this aspect of availability

The key difference between peak and flexible capacity is the speed with which it can be delivered and the lack of constraints on delivery. With this in mind, EPWA proposes to amend the outage regime to account for flexible capacity as follows:

- Participants will need to report technical parameter restrictions affecting facilities holding flexible CCs, including ramp rate, minimum stable generation, and minimum start/run/stop times. If a facility's parameters become such that it would no longer meet the requirements to be certified as flexible CC, it would be designated as being on outage for the purposes of flexible capacity. Such an outage could be planned or forced
- If AEMO observes non-response to dispatch such that facility operational parameters do not meet the certified requirements, the facility would be required to lodge a forced outage for the flexible capacity service
- During the outage assessment process, AEMO will need to compare the forecast need for flexible capacity with the remaining quantity of such capacity when deciding which outage requests to approve, and when to reschedule

Capacity Testing – Proposal

The current capacity testing regime tests the ability of a facility to reach its maximum certified output level twice per year – once during summer and once in winter

EPWA proposes that a facility holding flexible capacity credits would also need to be tested for its ability to:

- Reach its certified output quantity from an unsynchronised state at its certified maximum ramp rate
- Start, stop, and restart within its certified timings

These capabilities should ideally be tested at a point in the year before they are likely to be needed, but not so far before that system conditions are considerably different

- Because the maximum ramp for the year is likely to occur in shoulder seasons, the ideal timing would be at the ends of the summer and winter seasons

Disruption to market and participant operations will be minimised if these aspects can be tested:

- At the same time as peak capacity testing
- By observation, when a facility demonstrates its capability outside a scheduled test.

Refunds – Options

The current refund regime assesses refunds for a facility on unplanned outage, or with a planned outage rate greater than a defined threshold

Refunds are assessed at a higher rate in periods where most capacity is already generating, and at a lower rate when there is plenty of spare capacity. The rate is capped at 6 when there is less than 750MW of spare capacity

$$\text{RF dynamic}(t) = 11.75 - \frac{5.75}{750} \times \sum_{f \in F} \text{Spare}(f,t)$$

A separate dynamic refund multiplier can be made specific to the availability of flexible capacity by basing the multiplier on:

- Option 1: The remaining available undispached *flexible* capacity
 - This would mean the multiplier is still based on peak load, which is not aligned to the periods of highest ramp, which fall in the shoulder season
- Option 2: The ratio between the actual ramp in the interval and the ramp assumed when setting the flexible capacity target
 - This would mean that the multiplier is highest during periods of highest ramp, but would be more volatile. Volatility could be reduced by calculating the ramp over a longer time period

Refunds – Proposal

EPWA proposes to:

- Implement option 2
- Cap the multiplier at 6, like the peak capacity multiplier
- Require AEMO to publish the projected load ramp rate at the same time as the load forecast, to allow transparency for participants

As for peak capacity, collected refunds would be paid to flexible capacity holders who meet their capacity obligations

6. Penalties on High Emission Technologies

Previous Proposal to the RCMRWG

EPWA proposed to the RCMRWG that:

- Both the rate threshold and the quantity threshold would apply to new facilities at implementation
- Only an emission quantity threshold would apply to existing facilities
- A process would be needed for co-generation facilities to divide emissions between electricity generation and process heat

EPWA proposed:

- An emission rate threshold of 0.4 tCO₂e/MWh to apply to all *new* facilities from the 2026 capacity cycle (for the 2028 capacity year)
- An emission quantity threshold of 1,000 tCO₂e/MW to apply to all *new* facilities from the 2026 capacity cycle (2028 capacity year)
- An emission quantity threshold of 7,000 tCO₂e/MW to apply to all *existing* facilities for the 2026 capacity cycle (2028 capacity year)
- Decreasing the existing facility quantity threshold by 500 tCO₂e/MW each year, until the threshold is the same for new and existing facilities in the 2036 capacity cycle

Summary of RCMRWG Discussions

The RCMRWG almost unanimously supported RCM participation thresholds as the preferred option, if a penalty regime were to be implemented, but raised concerns that:

- The regime could come at a cost of system reliability by forcing early exit of facilities before replacement capacity is commissioned
- The proposed emission rate threshold would preclude new gas peaking generation
- Facilities built to act as baseload are not likely to be financially viable if forced to operate as peaking plant to reduce emissions
- The threshold for a new facility should not be subject to change for at least ten years
- Facility operation is not entirely within participant control, as offer prices must reflect competitive costs, and AEMO may direct operations to resolve system emergencies
- As existing fossil-fueled facilities retire, remaining schedulable facilities are likely to operate more, increasing the likelihood of exceeding the threshold
- A facility being above the emissions threshold in one year would rule out capacity payments in future years even if the facility was below the emissions threshold at a later date

Revised Proposal for Penalties – New Facilities (1)

EPWA proposes an **emission rate threshold for *new facilities*** of 0.55 tCO₂e/MWh to apply from the 2027 capacity cycle (for the 2029 capacity year)

- This threshold is:
 - Slightly lower than the emission rate of the newest open cycle gas turbines on the SWIS (0.57 tCO₂e/MWh)
 - Achievable by an efficient new gas-fired turbine or reciprocating engine (0.50 – 0.60 tCO₂e/MWh)

EPWA proposes an **emission quantity threshold for *new facilities*** of 1,000 tCO₂e/MW to apply from the 2027 capacity cycle (2029 capacity year).

- This threshold is sufficient to allow a facility at the emission rate threshold to operate about 20% of the time, meaning that a new, efficient gas-fired unit would be eligible for Capacity Credits, but only if it operates as a peaker

A process will be needed for co-generation facilities to divide emissions between electricity generation and process heat.

The proposed commencement date is indicative and may change following discussions.

Revised Proposal for Penalties – Existing Facilities (1)

EPWA proposes an **emission quantity threshold for *existing* facilities** of 4,000 tCO₂e/MW to apply to for the 2027 capacity cycle (2029 capacity year), decreasing by 500 tCO₂e/MW each year, until the threshold is the same for new and existing facilities in the 2033 capacity cycle (2035 capacity year)

- This aligns with government announcements to retire Collie and Muja, so that at current generation levels, they would be at or above the threshold to receive capacity credits in Capacity Year 2029

EPWA proposes that for ten years, a new facility would remain subject to the thresholds under which it first received capacity credits

Projected Capacity Not Eligible For Capacity Credits

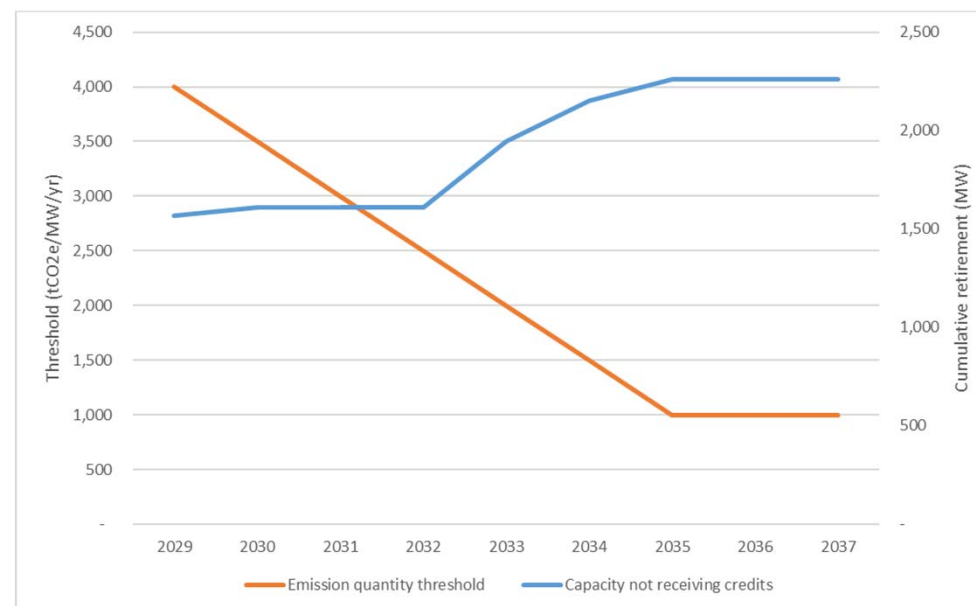
Applying an emissions quantity threshold to existing facilities is more supportive of ongoing reliability than applying an emissions rate threshold

Using a gradually decreasing threshold will allow orderly consideration of investment decisions, and ensure the impact on the fleet is spread over time

The chart gives the projected impact of how much capacity would become ineligible for capacity credits as a result of this policy, assuming that:

- Cogeneration facilities are not affected
- Facility emissions rates do not improve (if they do, impact could be delayed)
- Facility utilisation does not change (there is potential for utilisation of remaining facilities to increase as other facilities retire, but also for owners to reduce output to stay within the threshold)

Capacity announced by the Government to retire is included in this chart (it would be affected in CY 2029)



7. Outages and Refunds

Required Amendments to Outage and Refund Rules

The scope of the RCM Review includes identifying changes needed to the outage scheduling process and the refund regime to accommodate design changes in the RCM as a whole

EPWA considers that no changes are required to the current outage and refund regime for peak capacity, other than:

- for DSPs, as noted in previous RCMRWG discussions
- to incorporate the new flexible capacity product, as noted above

8. Next Steps



Next Steps

- Commercial analysis (as part of overall assessment of package)
- Information paper confirming outcome of phase 1 items
- Consultation paper for phase 2 items
- Questions or feedback can be emailed to energymarkets@dmirs.wa.gov.au

9. General Business



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Western Australia.*

Option 6 – Emissions Threshold for RCM Participation

- Using data from the Clean Energy Regulator to perform additional checks during CRC allocation for each facility:
 - Determine facility emissions rate (tCO₂e/MWh) in previous capacity year as:

$$\text{facility MWh emissions rate} = \text{facility scope 1 emissions} / \text{electricity production}$$
 - Determine facility emissions quantity (tCO₂e/MW) in previous capacity year as:

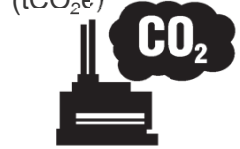
$$\text{facility MWh emissions rate} = \text{facility scope 1 emissions} / \text{nameplate capacity}$$
 - Determine whether facility MWh emission rate is below threshold:

$$\text{facility MWh emissions rate} \leq \text{rate threshold}$$
 - Determine whether facility MW emission quantity is below threshold:

$$\text{facility MW emission quantity} \leq \text{quantity threshold}$$
- If facility is above either threshold, CRC = 0
- Both thresholds would apply to all new facilities at implementation.
- Only the emission quantity threshold would apply to existing facilities
- A process would be needed for co-generation facilities to divide emissions between electricity generation and process heat

Option 6 – Emission Rate Threshold

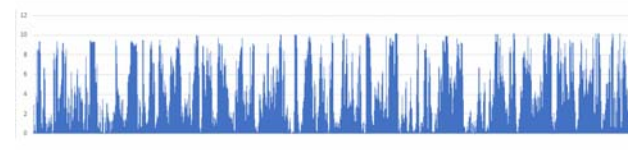
Facility annual scope 1 emissions (tCO₂e)



0



Previous capacity year facility generation (MWh)



Facility emission rate (tCO₂e/MWh)



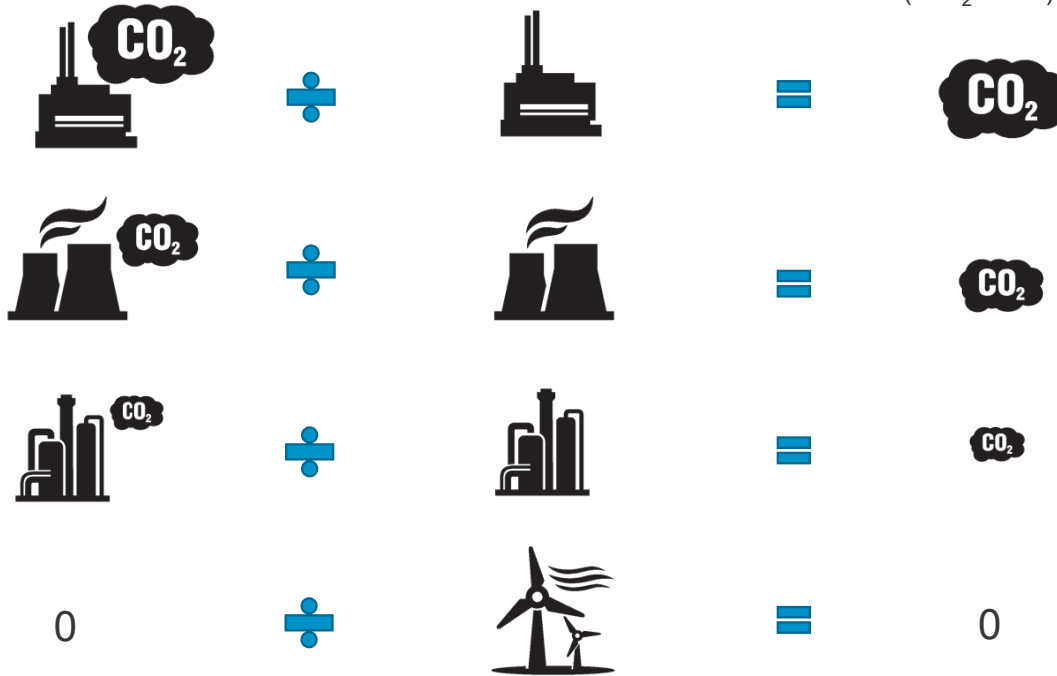
For each capacity year

Option 6 – Emission Quantity Threshold

Facility annual
scope 1 emissions
(tCO₂e)

Facility nameplate
capacity (MW)

Facility emission
quantity
(tCO₂e/MW)



For each
capacity year