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

Meeting Agenda

Meeting Title:	Reserve Capacity Mechanism Review Working Group (**RCMRWG**)
Meeting Number:	2023_03_02
Date:	Wednesday 2 March 2023
Time:	9:30 AM to 11:30 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_02_16	Chair	Decision	2 min
4	Action Items	Chair	Discussion	2 min
5	Penalties on High Emission Technologies	RBP	Discussion	40 min
6	Flexible Capacity – Additional Considerations	RBP	Discussion	30 min
7	Revisiting the Duration Gap	RBP	Discussion	30 min
8	Outages	RBP	Discussion	5 min
9	Next Steps	Chair	Discussion	5 min
10	General Business	Chair	Discussion	2 min
	Next Meeting: TBA			

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.

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Agenda Item 4: RCMRWG Action Items

Reserve Capacity Mechanism Review Working Group (**RCMRWG**) Meeting 2023_03_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
17	RCMRWG Secretariat to publish the minutes of the 1 February 2023 RCMRWG meeting on the RCMRWG web page as final.	RCMRWG Secretariat	2023_02_16	**Closed** Minutes published 16 February 2023

Government of **Western Australia**
Energy Policy WA

Reserve Capacity Mechanism Review Working Group

Meeting 2023_03_02

2 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. Penalties on High Emission Technologies

Shortlisted Options

Two options shortlisted in 2022:

- Option 1 – penalty on trading interval emissions
- Option 6 – emissions threshold for RCM participation

Option 6 is EPWA's preferred option, as it:

- Will provide more certainty of exit timing than option 1, maintaining reliability of supply
- Is simpler to implement and operate than Option 1
- Will have less effect on dispatch incentives, and thus less requirement to monitor and mitigate market power issues of cost pass-through
- Allows use of NGER data rather than requiring a new regime to be set up and run
- Received the most support from MAC and RCMRWG members

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 (tCO_2e/MWh) in previous capacity year as:

    facility MWh emissions rate = facility scope 1 emissions / electricity production
  - Determine facility emissions quantity (tCO_2e/MW) in previous capacity year as:

    facility MWh emissions rate = facility scope 1 emissions / nameplate capacity
  - Determine whether facility MWh emission rate is below threshold:

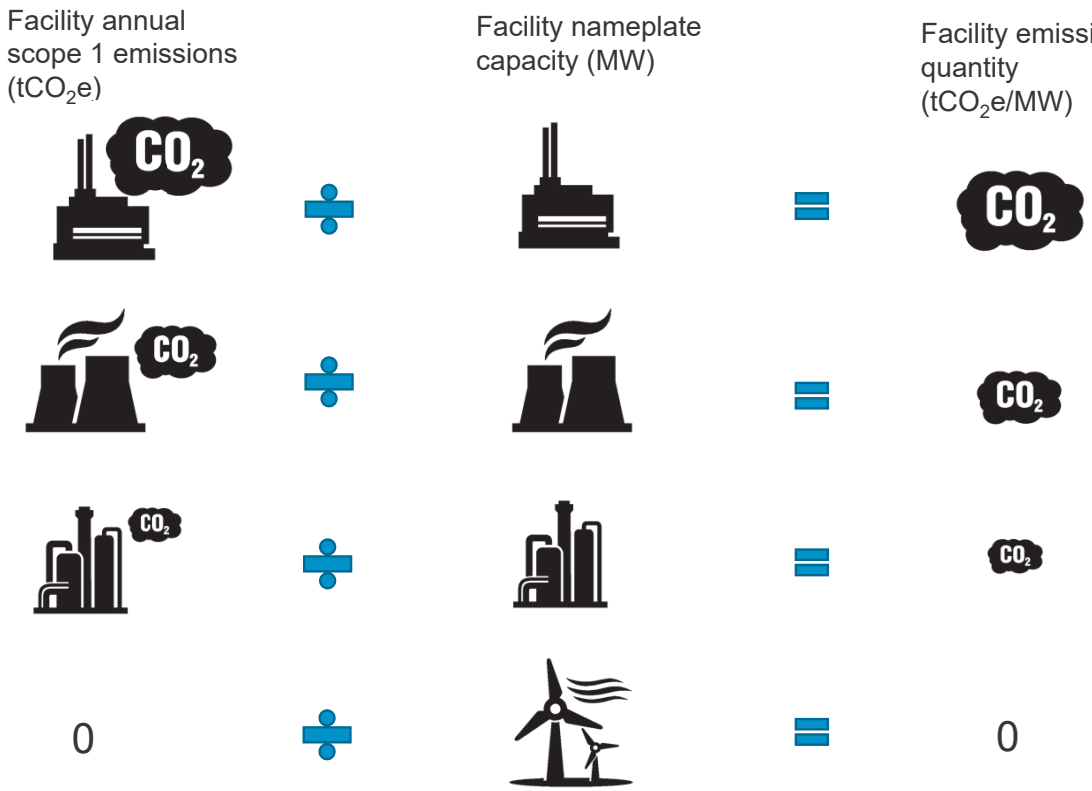
    facility MWh emissions rate ≤ rate threshold
  - Determine whether facility MW emission quantity is below threshold:

    facility MW emission quantity ≤ 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

For each capacity year

Option 6 – Emission Quantity Threshold



For each capacity year

Using the NGER Data

CER reports data for:

- Both scope 1 and scope 2 emissions
  - Scope 1 covers emissions from burning fuel in generation facilities, including for parasitic load
  - Scope 2 covers emissions relating to electricity imported from the grid
- Behind the meter facilities, including several intermittent loads which participate only partly in the RCM
- tCO_2 equivalent, rather than the European approach of CO_2 only

SWIS thresholds will be based on scope 1 emissions only, as including scope 2 emissions would double count emissions on electricity imported from the grid

Facility identifiers used in the NGER data are different from those used in WEM registration. In some cases facilities registered separately in the WEM are reported together in NGER data

Data is reported by 28 February for the period ending 30 June the previous year

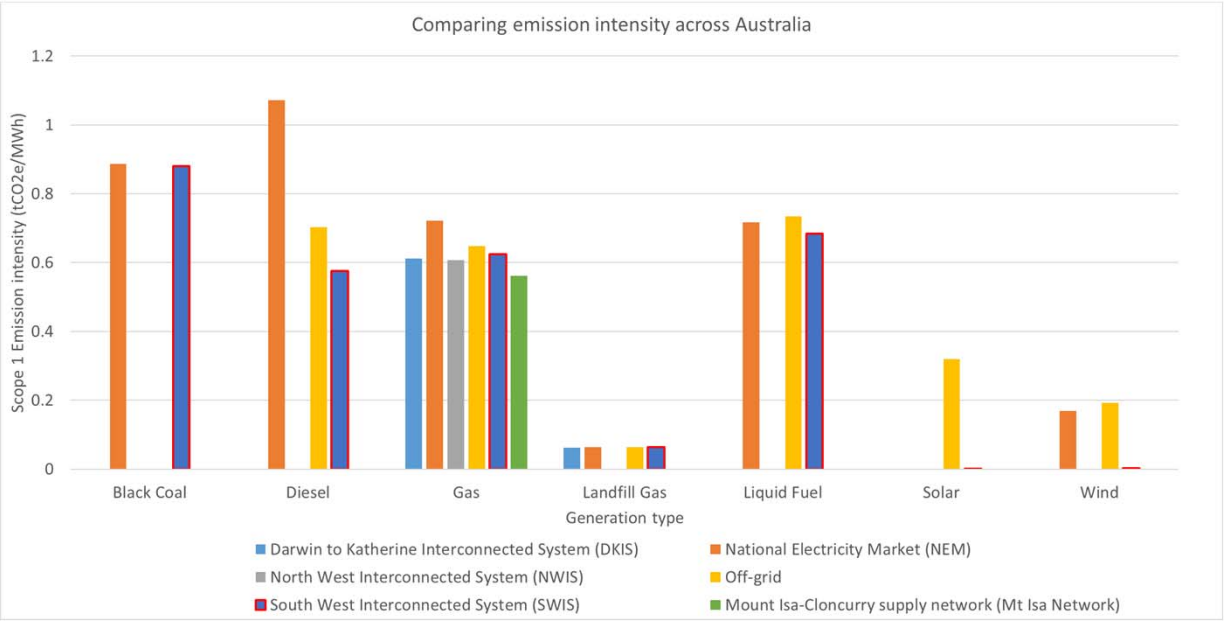
- Because of this lag in reporting, the previous year's emissions intensity would be applied to current year generation, and if a facility reached the quantity limit during the year, capacity payments would be foregone from that point on

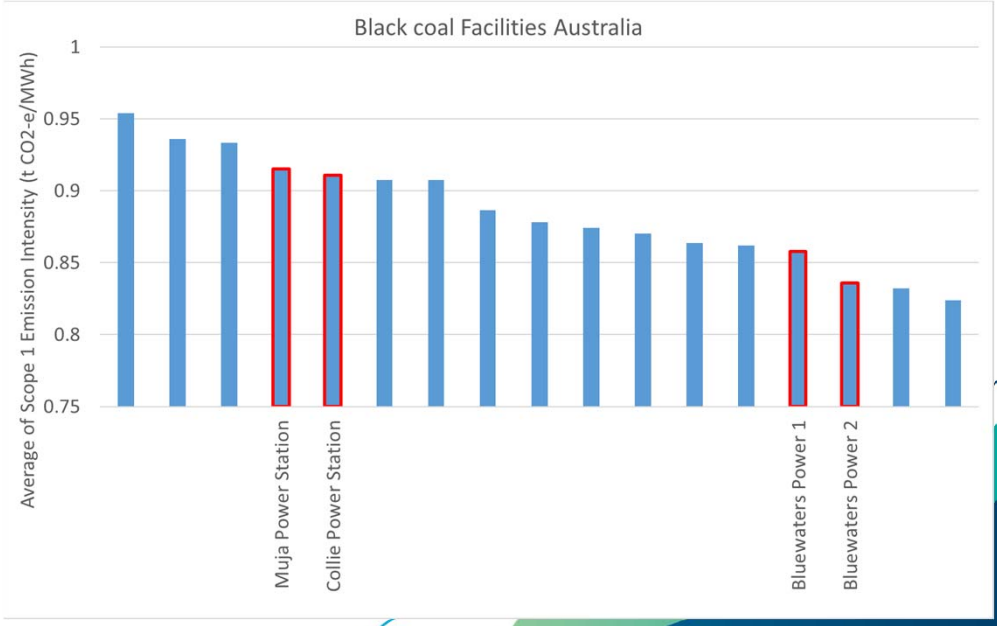
SWIS Generation Emissions Intensity

CER data for SWIS generation is consistent with that in the rest of the country

The left chart shows average emission intensity for different fuels across different power systems

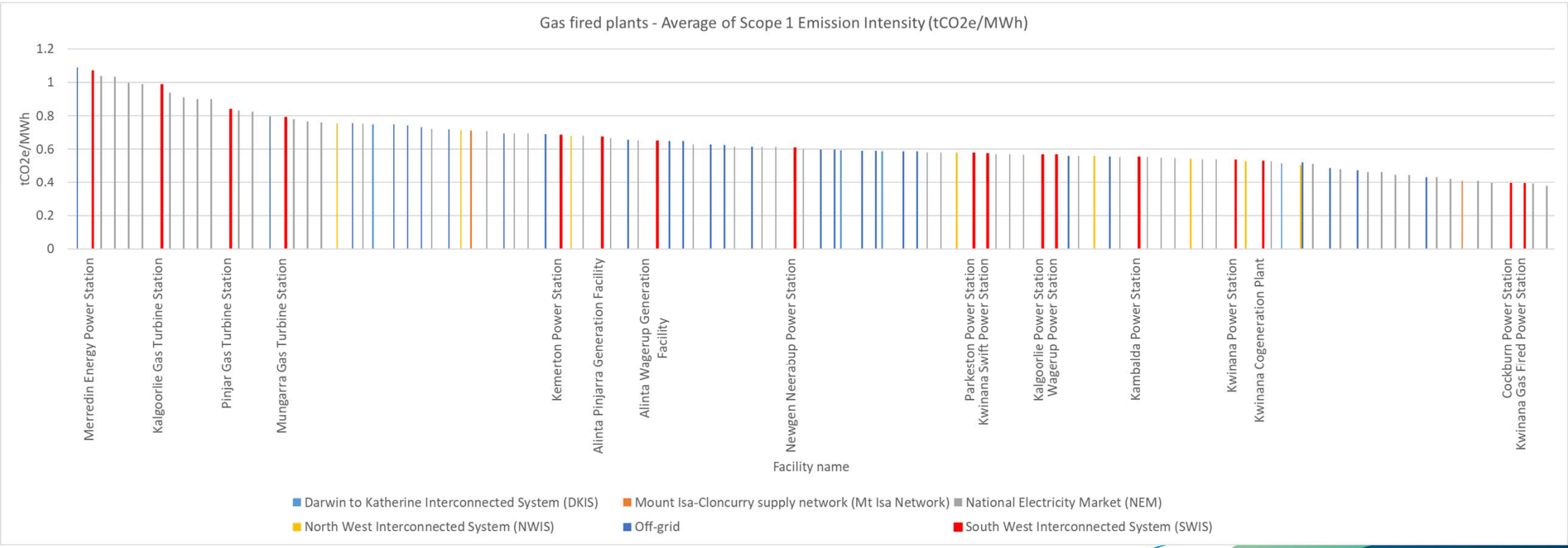
The right chart shows the five-year-average of NGER reported emissions intensity for black coal facilities





SWIS Generation Emissions Intensity – Gas

SWIS gas generation has a wide range of emission intensities



Emissions Intensity Threshold – Proposal

The European limit on emissions intensity is 0.55 tCO_2/MWh

The lowest emission gas-fired facility (CCGT) currently operating in Australia has an emissions intensity of 0.375 tCO_2e/MWh

EPWA proposes to set an emission intensity threshold of 0.4 tCO_2e/MWh to apply to all new facilities from the 2026 capacity cycle (for the 2028 capacity year)

This threshold would not apply to existing facilities

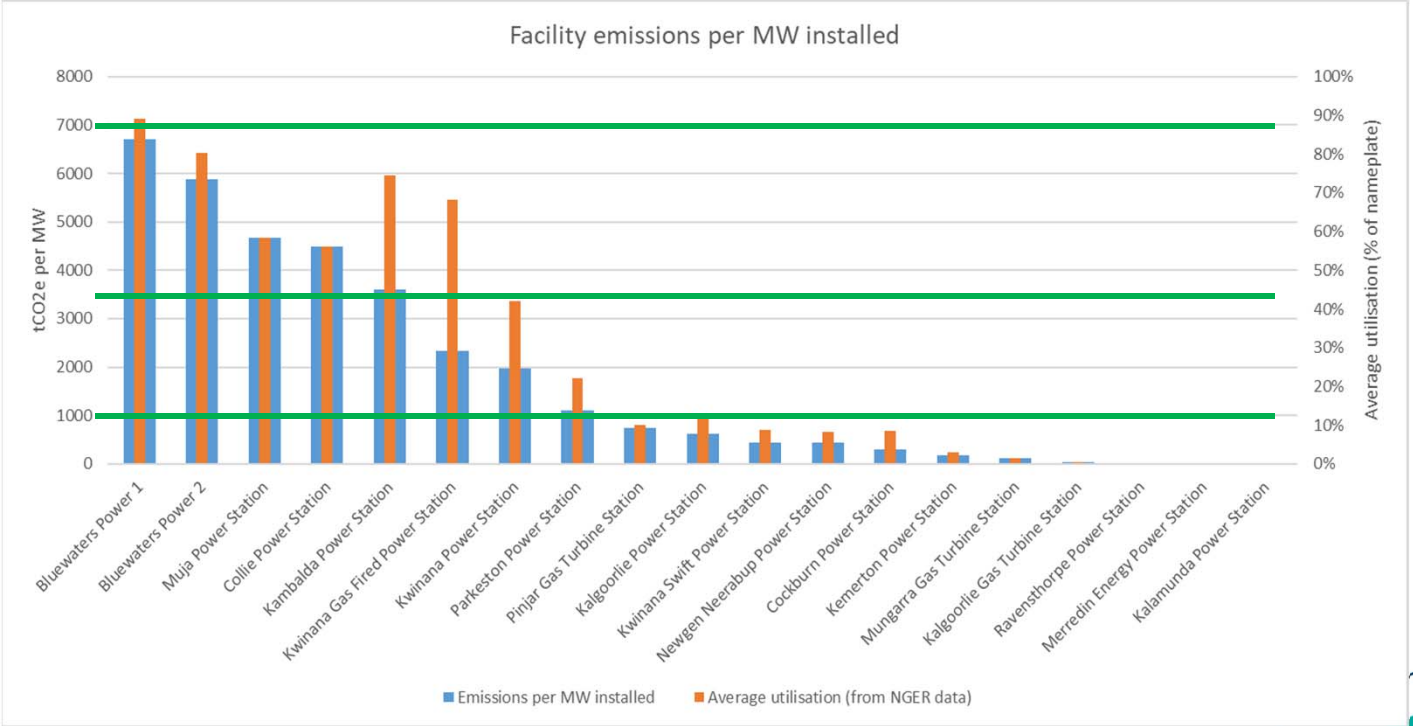
SWIS Emissions Quantities

The European limit on emissions per MW is 350 tCO_2/MW

A threshold of 7,000 tCO_2e/MW/year would not affect any SWIS facilities

A threshold of 3,500 tCO_2e/MW/year would allow a facility with emissions at the proposed intensity threshold to operate at full output all year, or a recently built peaking gas turbine to operate at about 70%

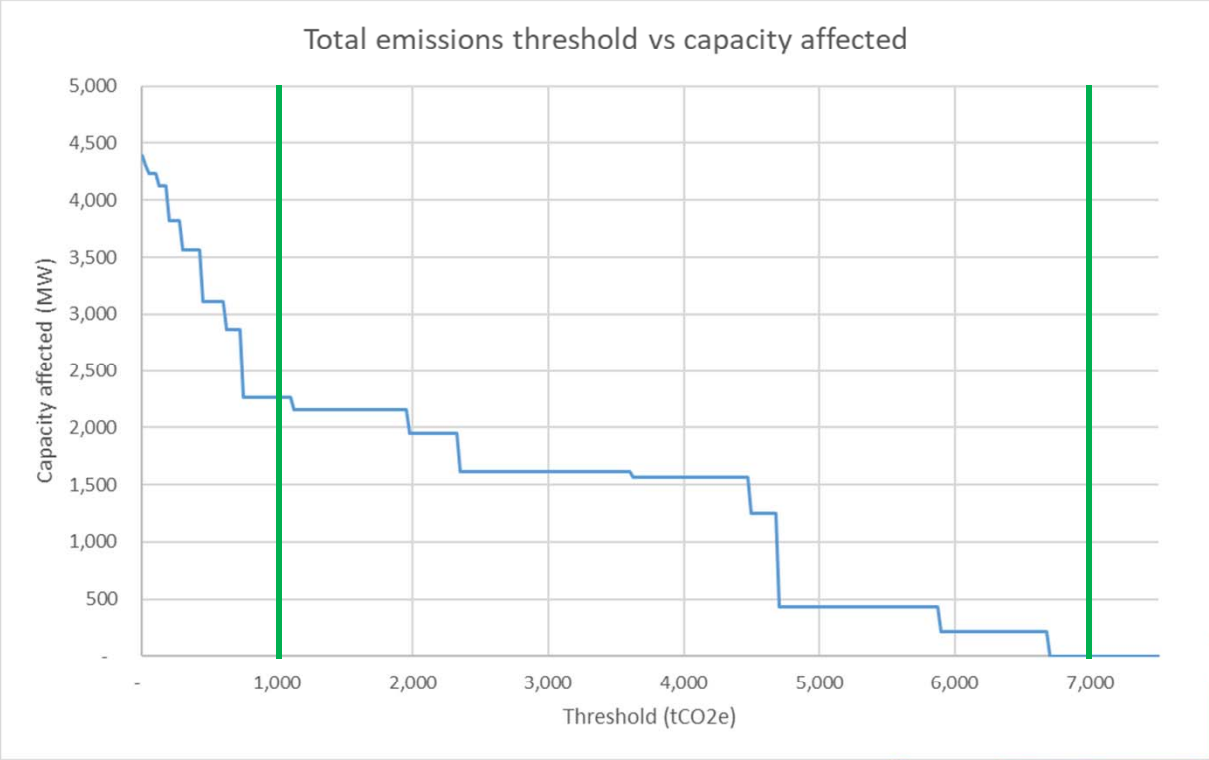
A threshold of 1,000 tCO_2e/MW/year would allow a facility with emissions intensity at the proposed threshold to operate around 30% of the time, and a peaker to operate around 20% of the time



Emissions Quantity Threshold – Proposal

EPWA proposes to:

- Set an emissions quantity threshold of 1,000 tCO_2e/MW to apply to all new facilities from the 2026 capacity cycle (2028 capacity year)
- Set an emission intensity threshold of 7,000 tCO_2e/MW to apply to all existing facilities for the 2026 capacity cycle (2028 capacity year)
- Decrease the threshold for existing facilities by 500 tCO_2e/MW in each subsequent year, until the threshold is the same for new and existing facilities in the 2036 capacity cycle



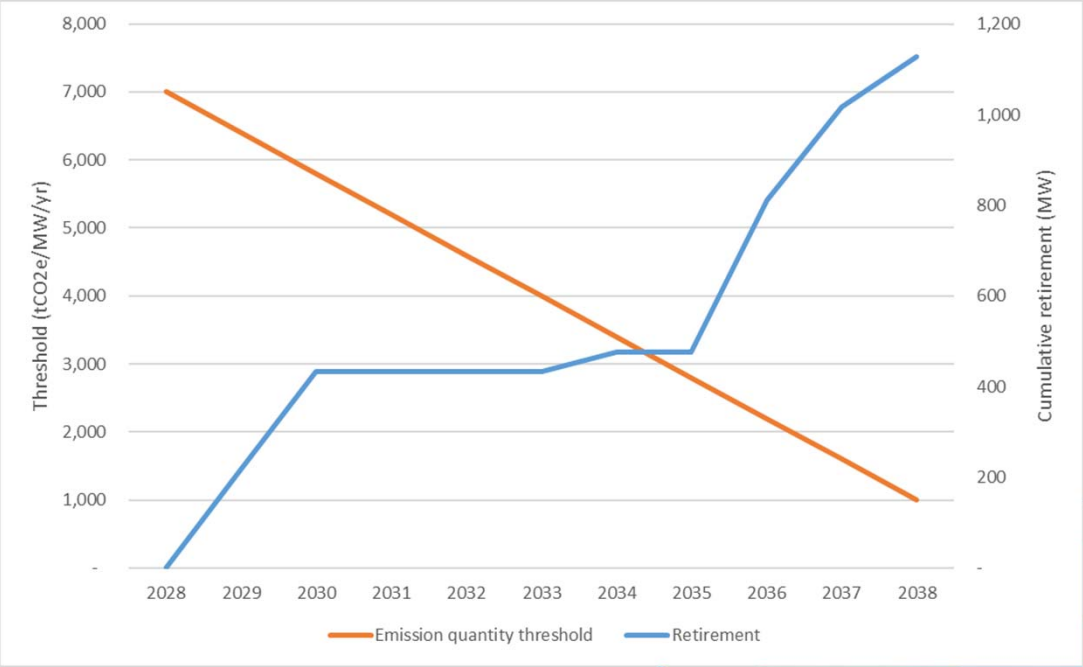
Facility total emissions used is the average for years 2017-2021

Projected Retirement Impact

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 potential retirement decisions, and spread potential retirements over time

The chart gives the projected impact on early retirement, assuming that:

- Cogeneration facilities are not affected
- Facilities retire immediately when not eligible for capacity credits. This would not necessarily be the case, particularly for those serving intermittent loads
- Facility emissions rates do not improve. If they do, retirements 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



6. 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 setting IRCR to recover the costs

The slides below cover:

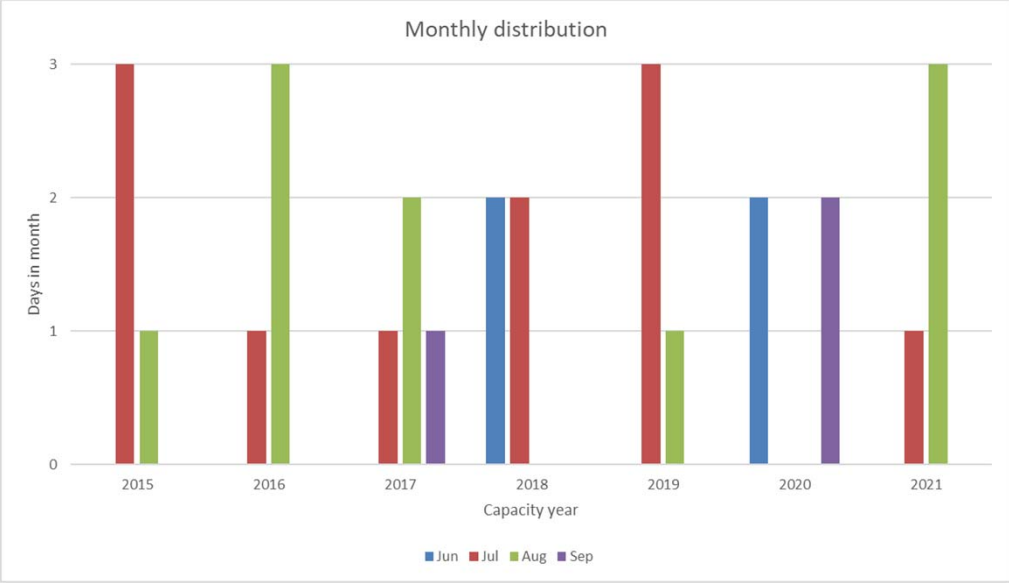
- Key factors for certification of facilities to provide flexible capacity
- Obligations for holders of flexible capacity credits
- Amendments to the outage regime to incorporate flexible capacity
- Approach to refunds for failure to meet those obligations

Dispatch

- Under current Real-Time Market rules, there is no specific service for fast-ramping facilities
- Facilities would 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, in the middle of the day, the load 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 become 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
- Implementing a dedicated ramping service would remove this risk – 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

Timing of Maximum Ramp (1)

- From the end of the midday trough through to the peak is generally around 4 hours
- In all years from 2015-2021, the four days with the highest 4-hour ramp quantities all occur in the shoulder season between June and September
- 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	
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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	
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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	
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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	
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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 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 [four] 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

Capacity Certification

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 unsyncrhonised 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

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 – Proposal

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 undispatched *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

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

7. Revising the Duration Gap

Duration Gap – Recap

In future years, there will be a ‘duration gap’ between the end of the evening ramp (when flexible capacity that ramps up to meet the evening peak load may have exhausted its availability) and sunrise (when behind the meter and grid scale solar start to ramp up)

By 2030, firm capacity will be needed to shift energy from the middle of the day to the peak period, with a total duration of around six hours. Initially, storage facilities which can discharge over the few peak hours will be sufficient to serve load and achieve adequate reliability

By 2050, with all thermal generation retired, the overnight gap must be filled primarily by wind, storage, and DSM across a total duration of around 14 hours

Duration Gap – Proposed Mitigations (Option 1)

In the consultation paper, EPWA proposed to:

- use an availability duration target in setting CRC for Class 2 facilities
- allow new facilities to lock in their initial duration target for their first five years
- after this period, prorate allocated CRC based on the prevailing duration target

The proposed changes to determination of IRCR intervals will ensure costs can be recovered from consumers based on their consumption across an extended peak period, and not their consumption in post-peak intervals affected by a duration gap

Under this approach:

- The duration gap is assumed to be met by either generation (primarily overnight wind in later years) or by increasing storage volumes to allow a longer discharge period
- Class 2 facilities that cannot discharge for the full required duration would receive fewer capacity credits than those that could

Duration Gap – Consultation Responses

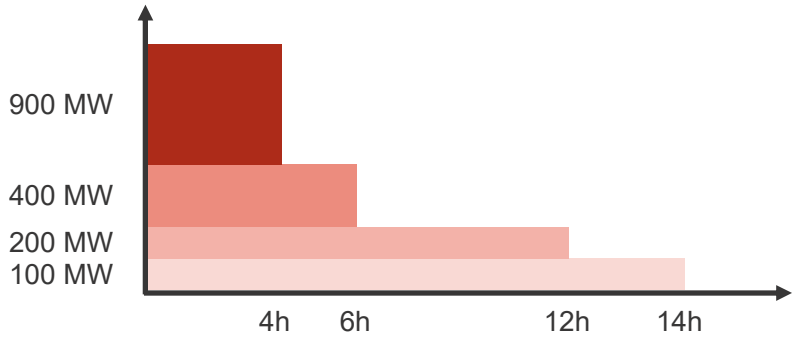
Responses to the stage 1 consultation paper supported the importance of encouraging longer term firming capability. Almost all thought that the lock-in period should be longer than 5 years, but whatever it is, it should be the same as the timeframe used by the ERA to set the BRCP

Participants suggested that the duration gap may need to be treated differently. Comments included that:

- Mitigating a duration gap is different to mitigating against peak demand stress or ramping requirements, so duration could be considered a product like peak capacity and flexible capacity
- A set of mixed duration ESRs could be stacked to match the load shape at lower cost than requiring all facilities to be available for the entire duration
- It is unfair for Class 2 facilities to receive the same CRC for meeting a lower duration requirement. Class 2 facilities could be separated based on their availability duration and receive a different capacity price, or have their CRC prorated based on duration
- Current requirements on storage may result in energy and ESS capacity being routinely withheld unnecessarily, and it could be more efficient to allow facilities to offer their entire MW capacity and have their MWh exhausted during the RCOQ window
- The ability for storage to charge will be dependent on renewable energy fuel availability, so *energy* availability is an important consideration, particularly for longer duration stress events

Duration Gap – Option 2

Some respondents suggested that AEMO could calculate separate the duration requirement into several parts and select Class 2 capacity of multiple durations to fill the aggregate requirement:



The same peak requirement would be procured, but the evolving shape of the post-peak would be accounted for by procuring capacity from facilities with a range of availability durations

Rather than prorating the MW based on duration, the duration would become a payment multiplier. Class 1 facilities would get a 100% price multiplier, and a 6h facility would receive a 6/24 multiplier

EPWA considers that this approach is not appropriate as it would move:

- Away from providing each MW of CRC available at peak with the same payment
- Towards treating capacity as a MWh contribution instead (at least for Class 2)
- The RCM towards a MWh target rather than a MW target

Duration Gap – Option 3

Some respondents suggested that a third capacity product be defined to explicitly deal with the duration gap

Under this option, the capacity mechanism would distinguish between peak capacity, flexible (ramping) capacity, and duration capacity – this would provide an additional incentive for duration rather than applying a derating to capacity based on its availability

The duration product would:

- specify availability over a certain number of hours post-peak (determined by AEMO and published in the ESOO), extending over time to eventually span the entire overnight period
- apply to facilities that could supply during the peak period *and* afterwards, so:
  - Facilities would need to be certified for peak capacity to provide duration capacity
  - Class 1 facilities could expect to receive the same MW of peak and duration capacity
  - The peak capacity CRC process for Class 2 facilities would revert to considering peak supply only
  - Class 2 facilities would only be certified for duration capacity if they have sufficient energy to be able to deliver during both the peak and overnight
  - Class 3 facilities would only be certified if they could provide supply in the post-peak
  - If peak capacity were sufficient to cover the duration required, no additional capacity payment would be required

8. Outages

Required Amendments to Outage Rules

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

EPWA considers that no changes are required to the current outage regime for peak capacity, other than for DSPs, as noted in previous RCMRWG discussions.

As noted above, the outage regime will require some extensions to incorporate the new flexible capacity product, and potentially another product for duration.

9. 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@energy.wa.gov.au

10. General Business


We're working for
Western Australia.