Government of **Western Australia**
Energy Policy WA

Reserve Capacity Mechanism Review Working Group

Meeting 2022_07_14

14 July 2022

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 energymarkets@energy.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

Item	Item	Responsibility	Type	Duration
1	Welcome and Agenda	Chair	Noting	5 min
2	Meeting Apologies/Attendance	Chair	Noting	2 min
3	Minutes of RCMRWG meeting 2022_06_16	Chair	Decision	3 min
4	Action Items	Chair	Discussion	2 min
5	Project Timeline	RBP	Discussion	3 min
6	BRCP for Peak Capacity Product	RBP	Discussion	30 min
7	BRCP for Flexible Capacity Product	RBP	Discussion	25 min
8	Covering the Duration Gap	RBP	Discussion	40 min
9	Next Steps	Chair	Discussion	5 min
10	General business	Chair	Discussion	5 min

5. Project Timeline

Project Timeline

08/07

Stage	Step	Short description	Analysis	Week ending 21/01	28/01	4/02	11/02	18/02	25/02	4/03	11/03	18/03	25/03	1/04	8/04	15/04	22/04	29/04	6/05	13/05	20/05	27/05	3/06	10/06	17/06	24/06	1/07	8/07	15/07	22/07	29/07	5/08	12/08	19/08	26/08	2/09
1	Working group meetings		RCM Working Group meetings	WG				WG				WG							WG				WG		WG				WG								
1	MAC meetings		MAC meetings							MAC					MAC						MAC						MAC								MAC	
1	Step 1	Requirements analysis	(a)International Literature review																																	
1	Step 1		Gather assumptions and set up models																																	
1	Step 1		(b)Model system stress																																	
1	Step 1		(c)Analyse the required capacity services																																	
1	Step 2	Review Planning Criterion	(d)Assess the Planning Criterion																																	
1	Step 2		(e)Assess the ICAP and UCAP Concepts																																	
1	Step 3	Review CRC allocation	(f)Assess CRC Allocation and identify options																																	
1	Step 5	Model CRC allocation	(h)Scenario Analysis - Model CRC allocation options																																	
1	Step 4	Review BRCP	(g)Analysis of the BRCP																																	
1	Consultation paper		Consultation paper																																	

Purpose of this Session

- In this session we will discuss the appropriate method to set of the Benchmark Reserve Capacity Price (**BRCP**) for each of the two potential capacity products.
- We will also discuss considerations around incentivizing capacity that can cover the overnight duration gap.

6. BRCP for Peak Capacity Product

Current State

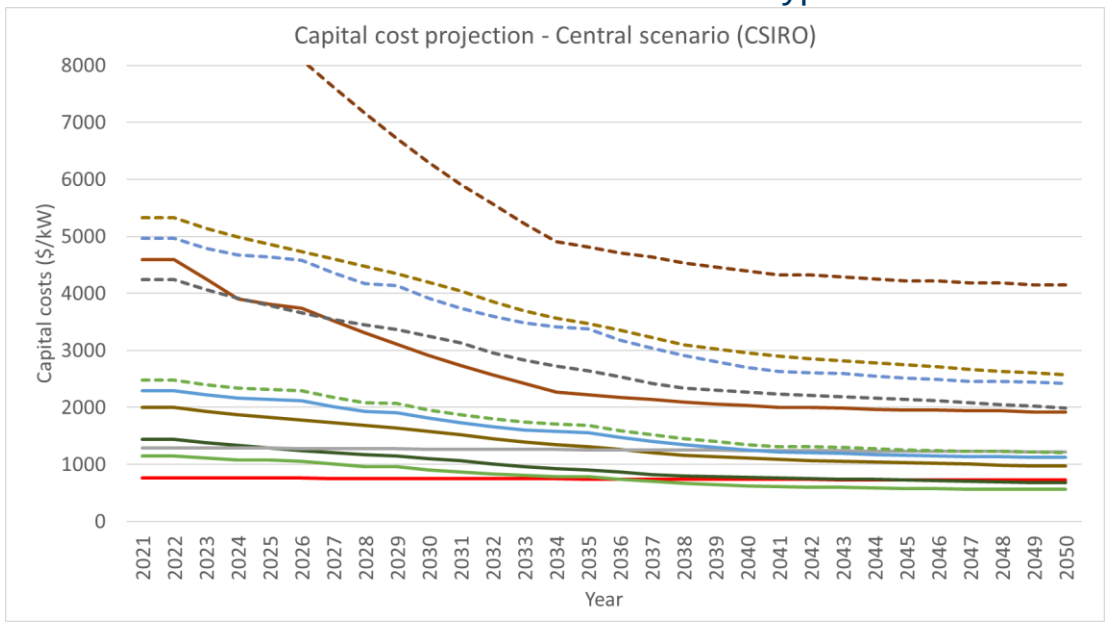
- The BRCP is the anchor for the administered reserve capacity price paid to each provider of capacity.
- Depending on under- or over-supply of capacity, the actual administered capacity price received by each facility may be greater than (up to 130% of) or less than (down to 0% of) the BRCP.
- The WEM Rules used to specify how to determine the BRCP in an appendix, but currently provide little guidance, delegating the method to a WEM Procedure developed and published by the ERA.
- The WEM Procedure defines a specific power station to be used as the basis for the BRCP: a 160MW liquid fueled Open Cycle Gas Turbine (**OCGT**), the configuration of the station, and various commercial and financial parameters that are needed to determine the total capital and fixed operating costs of the facility.
- The capital and fixed operating costs are annualized over a 15 year period, and divided by the expected facility capacity at 41ºC to give a cost per MW of capacity.
- Thus, the BRCP is set at the gross Cost of New Entry (**CONE**) for a liquid fueled OCGT.

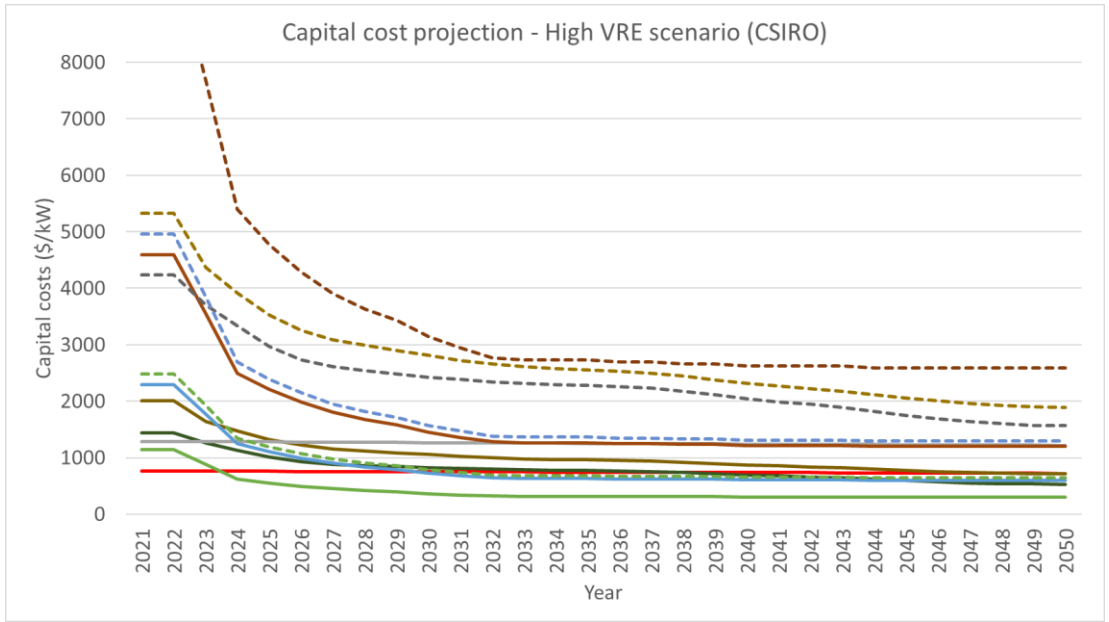
Principles for Setting the BRCP

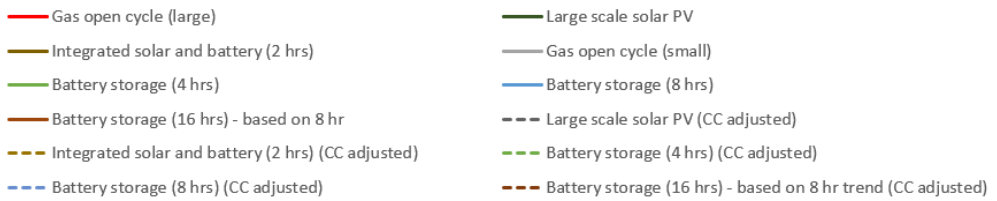
- The WEM Rules should provide guidance or a high level methodology for the BRCP.
- The details of the BRCP determination can be delegated to a WEM Procedure.
- Together, the WEM market components must provide a means for providers of market services to recover all their long-run costs – including both capex and opex.
    - It does not guaranteed that inefficient participants will recover long-run costs, but there must at least be a clear view to investors on how an efficient provider would get a return on its investment.
- The BRCP should be set based on the marginal cheapest new entrant provider of new *capacity* – which may not be the same as the marginal provider of *energy*.
- The determination of BRCP must align with the determination of market offer and price caps.

What will the Marginal Capacity Provider Be? (1)

- CSIRO forecasts that, while wind and solar have the lowest $/MWh cost, OCGT will continue to have the lowest $/MW cost until some time in the 2030s.
- When adjusting variable renewables to account for capacity derating, OCGT continues to be the lowest $/MW cost capacity provider until 2050, unless something else (e.g. government policy, fuel availability or network congestion in possible locations) means that no new facilities of that type can be built.







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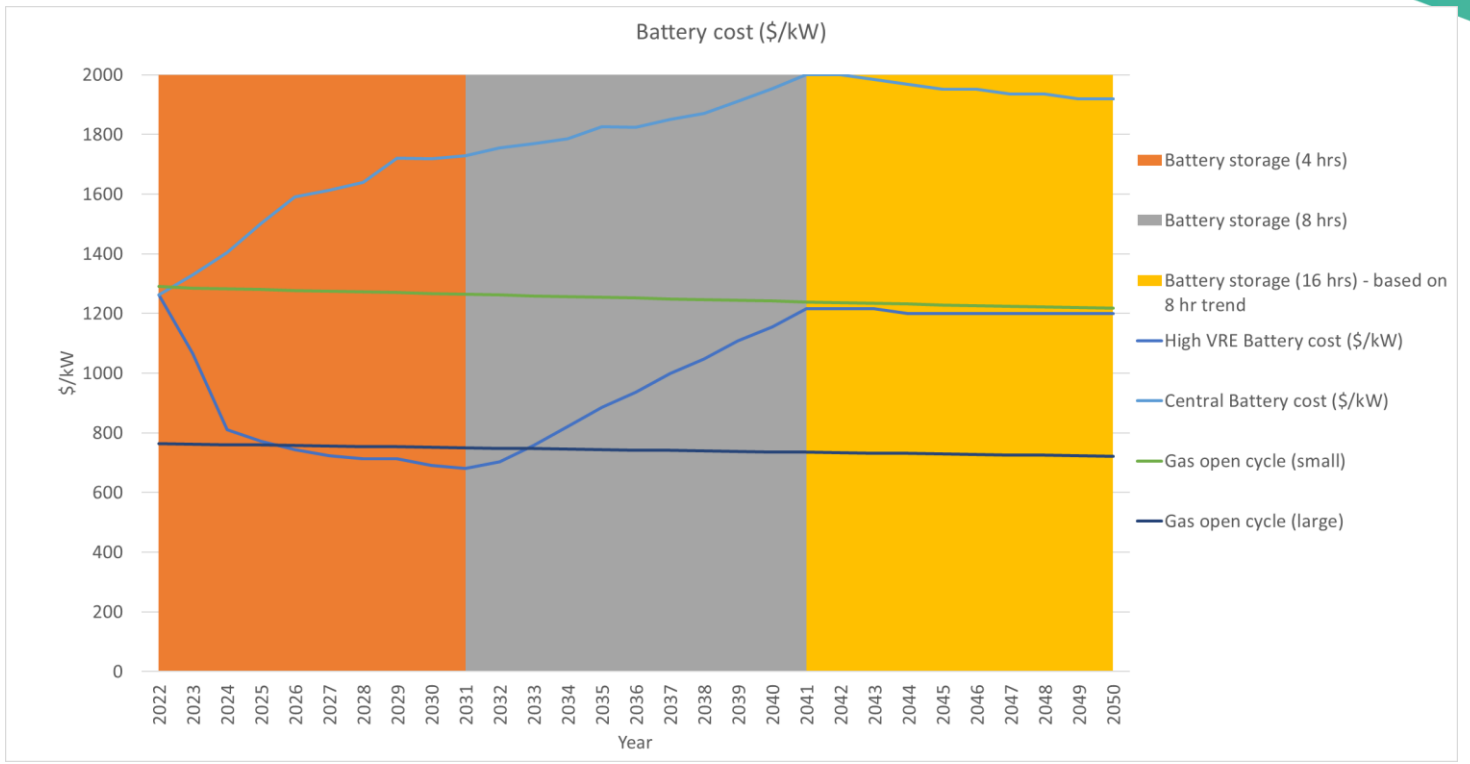
What will the Marginal Capacity Provider Be? (2)



- *Proposal: the WEM Rules define the BRCP as the per MW capex cost of the new entrant technology with the lowest expected* capital cost, with the ERA to set the reference facility every 5 years.
  - This means the reference technology will continue to be set based on OCGT technology until it is no longer credible that a new OCGT could be built in an uncongested part of the network.
  - If BRCP were to be set based on a more expensive technology *while OCGT can still be built*, OCGT would still be the cheapest new entrant, and be overcompensated for its costs.

Gross CONE or Net CONE

- The Market Power Mitigation Review is proposing that the Max STEM Price be set based on the highest short run cost facility in the fleet, with ESS offer caps set at the highest enablement cost for any of the five services, with opportunity cost added for settlement. This would allow this facility to recover short-run costs when it runs, but not get a contribution to capital costs.
- At present, the facility with the highest short run costs is also likely to be the facility with the lowest capital costs: an OCGT. Such a facility will rely on the RCM to recover all of its capital costs.
- This means that, in the WEM, gross CONE and net CONE are the same for the marginal provider of capacity as long as it is also the most expensive provider of energy.
- If the marginal capacity provider does not have the highest short-run costs in the fleet, then it will recover some contribution to its capital costs through infra-marginal rents in the energy market, and setting BRCP at gross CONE would overestimate the marginal cost of new capacity entry.
- Proposal:
  - BRCP should be set based on net CONE of the marginal capacity provider.
  - BRCP can continue to be set based on the gross CONE of the marginal new capacity provider as long as its short-run costs are close to the energy market price cap.
  - Consideration of gross vs net CONE to be included in the 5 yearly review of the reference technology.

Future BRCP Review

- For at least the next 5-10 years, OCGT technology has a place in the fleet, and will remain the relevant benchmark for the BRCP.
- At some point, it will no longer be credible that OCGT can be built, or network location considerations may mean that it cannot be built without capacity being derated due to NAQs. When this happens, the BRCP methodology will significantly increase in complexity, to determine the lowest $/MW of capacity on a net CONE basis:
  - after derating for intermittency;
  - accounting for the effect of NAQs; and
  - after deducting expected energy and ESS profits from capital costs.
- Other important considerations may also emerge as the shape and pace of the fleet change becomes clearer.
- The WEM Rules need to provide guidance for the ERA to identify when such a change is likely to be necessary, and the factors that will need to be accounted for – e.g. the size of the representative facility.

7. BRCP for Flexible Capacity Product

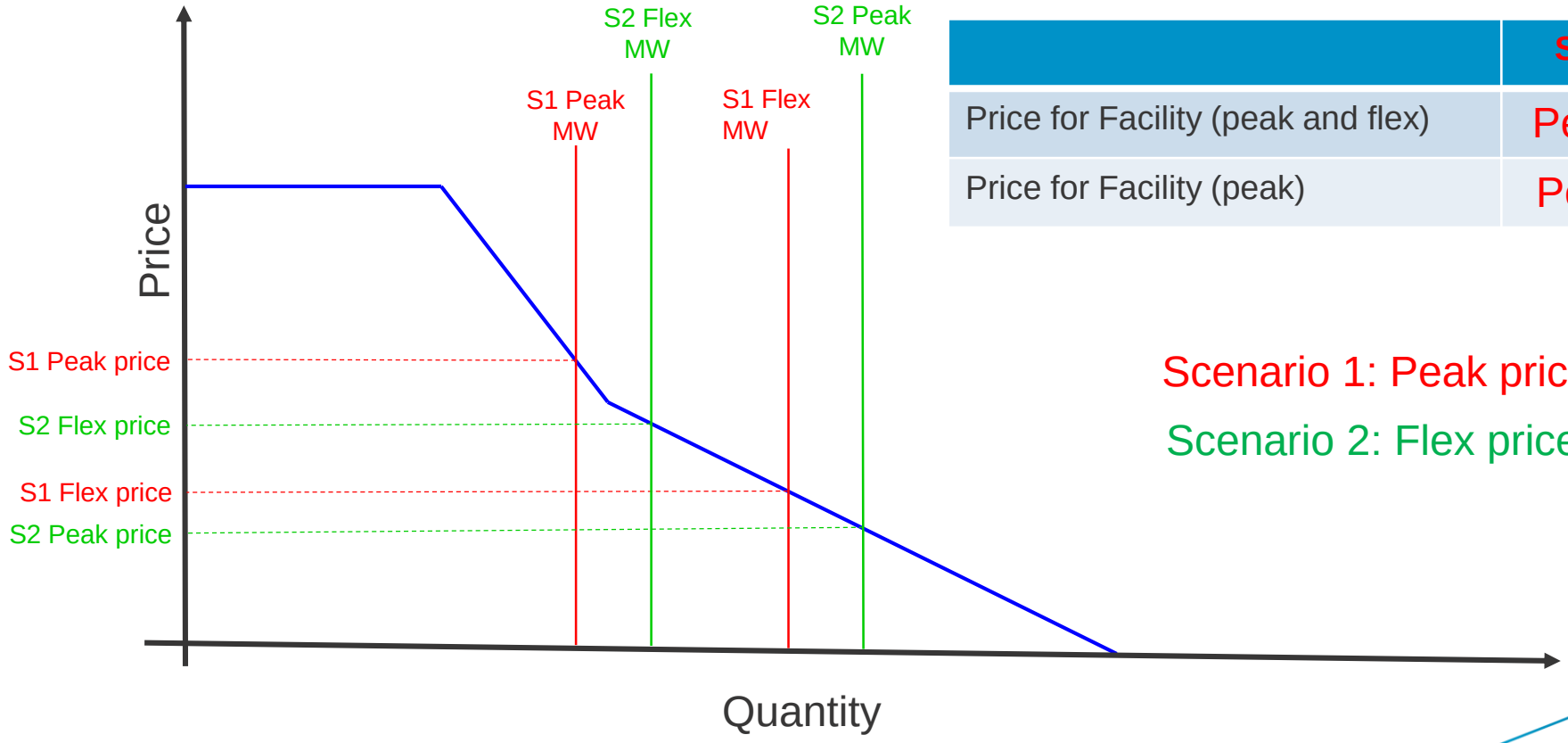
Setting the BRCP for Flexible Capacity Providers

- OCGT facilities are likely to be able to provide flexible capacity as well as peak capacity. Based on the CSIRO data, OCGT will be the cheapest new entrant provider of flexible capacity out to 2050.
- Setting the BRCP for the flexible capacity product higher than OCGT capital costs while OCGT can still be built would see OCGT overcompensated for capacity provision.
- Given that the flexible capacity product is designed for a world where there are no OCGT facilities, one option would be to bar *new* fossil-fuelled facilities from providing flexible capacity.
  - This would depart from the principle of technology neutrality, and the marginal provider would probably be hybrid intermittent/storage.
  - BRCP would need to be set based on Net CONE for such a facility, accounting for expected revenues from energy and ESS, and accounting for the effect of NAQs.
- Proposal:
  - remain technology neutral, and set BRCP for flexible capacity based on the lowest capital cost new entrant provider which can provide this product.
  - Methodology for OCGT flex BRCP to include any additional cost components needed to ensure that the facility is configured for fast start, fast ramping, and low minimum generation.

Interaction between Peak and Flexible Capacity Procurement

- If a facility provides both peak capacity and flexible capacity, it does not need to be compensated for its capital costs for both products (except where there is additional investment required for flex capacity).
- If the same price curves are used for both products, the product with the higher relative shortfall (or lower relative oversupply) will have the higher price.
    - If the reserve margin for flexible capacity is tighter than the reserve margin for peak capacity, the flexible capacity product would have the higher price.
- Setting the facility capacity price for a facility that provides both products at the higher of the two product prices would avoid overcompensation, preserve the pricing signals for both products, and avoid incentives to withhold capacity.
- This would also lend itself to separating costs of procuring the two capacity products into two categories:
    - costs shared across the two products; and
    - costs specific to the higher priced product.

Pricing for Facilities that provide Peak Capacity vs Facilities that provide Peak and Flex Capacity



	Scenario 1	Scenario 2
Price for Facility (peak and flex)	Peak price	Flex price
Price for Facility (peak)	Peak price	Peak price

Scenario 1: Peak price > flex price

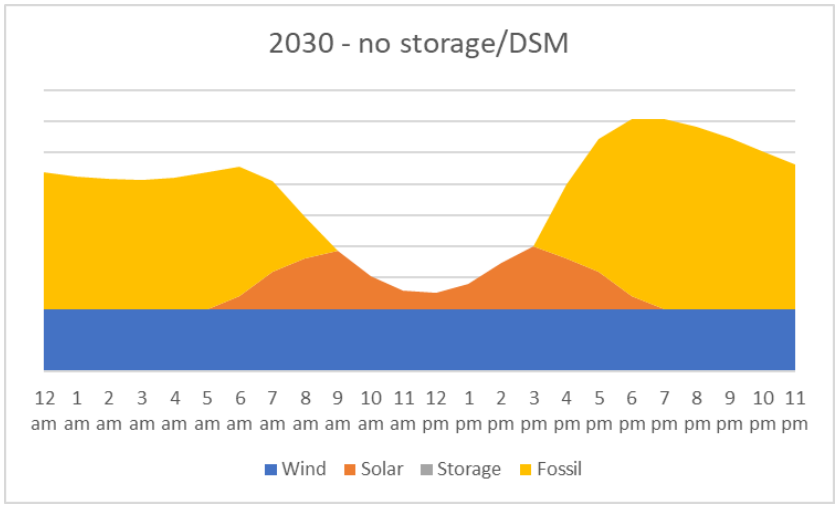
Scenario 2: Flex price > peak price

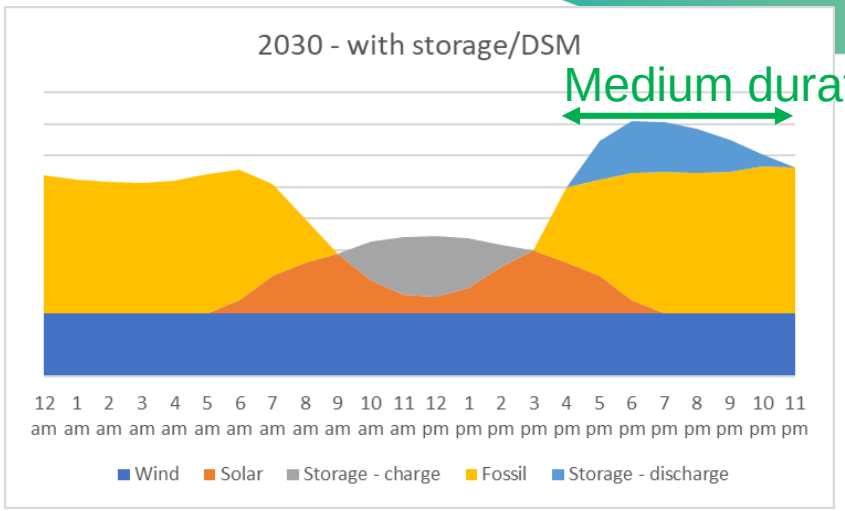
8. Covering the Duration Gap

Recap: Capability Class Proposal

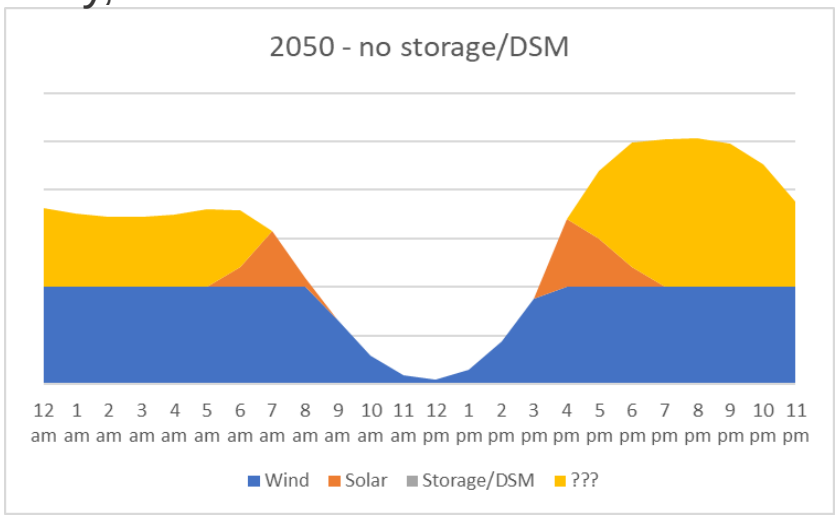
- **Proposal:** Replace availability classes with “capability classes” that better align with firmness of delivery and availability obligations:
  - Class 1: Unrestricted firm capacity (no fuel/availability limitations)
  - Class 2: Restricted firm capacity (fuel/availability limitations)
  - Class 3: Non-firm capacity
- Class 1 and 2 facilities would have availability obligations (and be subject to refunds).
- Class 3 facilities would not have availability obligations, but would expect to have significantly lower CRC than facilities in the other classes.
- Existing and committed facilities in all classes would receive Capacity Credits, but when there is a capacity shortfall, new facilities in lower classes would be preferred to those in higher classes.

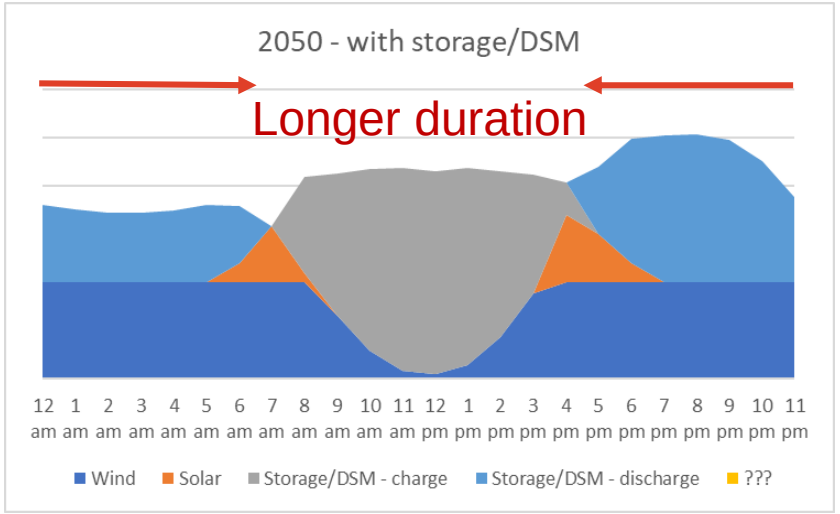
A 100% Renewable Fleet will Operate Differently





Example load shapes and generation output profiles for 2030 and 2050. Illustrative only, does not reflect exact data.





Dealing with the Duration Gap

- System stress modelling showed that – after 2030 – firm capacity duration becomes a key factor in serving load overnight. 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 BTM and grid scale solar ramp up).
- This means that capability Class 2 facilities that cannot maintain output overnight would not be providing the same contribution to system reliability as facilities that can.
- Ideally, the RCM should provide a signal of the needed availability duration as it evolves over the years, and incentive for new entrant facilities to be configured to meet it.
- We can account for availability duration in either the facility capacity price or the quantity of Capacity Credits allocated.

Incentivising Longer Duration Availability

- It is simpler to see a consistent way to differentiate quantities than prices. If not using ELCC method, or only using ELCC for pure intermittent (Class 3) facilities, the RCM would need to specifically address availability duration in capacity certification.
- Proposal:
  - AEMO publishes an availability duration target in the ESOO calculated assuming:
    - Forecast 10% POE day load shape
    - Existing/committed capability Class 1 capacity is fully available
    - Existing/committed capability Class 2 capacity is available per transitional arrangements (next slide)
    - Existing/committed class 3 facilities output per their CRC.
  - Facilities in capability Class 2 are assessed for CRC based on this availability duration, with facilities with less than full availability receiving a prorated CRC (e.g. if target is 10 hours, but facility has 8 hours availability, it would receive 0.8 x CRC).

Does the RCMRWG see better options for incentivising longer duration capacity?

Transitional Arrangements

- Certainty of configuration is important for investment.
- Changing the availability hours after certification can be managed, but extending the expected availability duration after a facility is built would affect the economics of the project by potentially reducing the number of Capacity Credits held.
- To support investment certainty, existing Class 2 facilities within 5 years of commissioning could be allocated CRC based on the availability duration applied when they were first certified.
- These facilities would be accounted for in setting the duration target for future years (previous slide).

9. Next Steps

Next Steps

- MAC discussion on consultation paper content (late August)
- Consultation paper end of August
- Questions or feedback can be emailed to energymarkets@energy.wa.gov.au

10. General Business

We're working for Western Australia.