

Minutes

Meeting Title:	Reserve Capacity Mechanism Review Working Group (RCMRWG)
Date:	5 May 2022
Time:	9:30am – 11:30am
Location:	Microsoft TEAMS

Attendees	Company	Comment
Laura Koziol	Chair	Proxy for Dora Guzeleva
Paul Arias	Bluewaters Power	
Rhiannon Bedola	Synergy	
Manus Higgins	AEMO	
Peter Huxtable	Water Corporation	
Mark McKinnon	Western Power	From 9:45 AM
Wendy Ng	Shell Energy	
Patrick Peake	Perth Energy	
Jacinda Papps	Alinta Energy	
Toby Price	AEMO	Subject matter expert
Matt Shahnazari	Economic Regulation Authority	
Noel Schubert	Small-Use Consumer representative	Observer
Dev Tayal	Tesla Energy	
Rebecca White	Collgar Wind Farm	
Andrew Stevens	Clear Energy	
Richard Bowmaker	Robinson Bowmaker Paul (RBP)	
Ajith Sreenivasan	RBP	
Tim Robinson	RBP	
Stephen Eliot	Energy Policy WA (EPWA)	
Shelley Worthington	EPWA	

Apologies	From	Comment
Dora Guzeleva	Chair	
Dale Waterson	Merredin Energy	
Andrew Walker	South32 (Worsley Alumina)	

Subject

1 Welcome

Item

The Chair opened the meeting at 9:30am.

2 Meeting Apologies/Attendance

The Chair noted the attendance as listed above.

3 Minutes of RCMRWG meeting 2022_03_17

Draft minutes of the RCMRWG meeting held on 17 March 2022 were distributed in the meeting papers on 29 April 2022.

The RCMRWG noted the tracked changes in the draft minutes and accepted the minutes as a true and accurate record of the meeting.

Action: RCMRWG Secretariat to publish the minutes of the	RCMRWG
17 March 2021 RCMRWG meeting on the RCMRWG web page as	Secretariat
final.	

4 Action Items

The paper was taken as read. All action items were closed.

The slides for agenda items 5 to 10 are available on the webpage for the RCM Review (<u>https://www.wa.gov.au/government/document-collections/reserve-capacity-mechanism-review-working-group</u>).

5 Project Timeline

Mr Robinson presented the timeline in slides 4 to 6 and noted the following about the status of the project:

- considerable progress has been made on the project the international literature review is complete, data has been gathered, and the system stress modelling has commenced (initial results are discussed under agenda item 6);
- indicative directions have been identified for defining the capacity service and the planning criterion based on the system stress modelling;
- further modelling and analysis are to be completed; and
- a draft consultation paper is to be completed in August 2022.

Action

Subject

Action

6 System Stress Modelling Outputs

Item

Mr Bowmaker presented the initial results of the system stress modelling in slides 7 to 17. The discussion was as follows:

- Mr Bowmaker noted that
 - the system stress modelling looked at:
 - the causes of system stress in 2022, 2030 and 2050;
 - how the current generation mix and other capacity sources will operate and how they will support the identified types of current and future system stress;
 - whether the current Planning Criterion is adequate to meet the capacity requirements in the South West Interconnected System (SWIS);
 - the modelling methodology was to:
 - generate future load and variable renewable energy traces;
 - insert the traces into a system adequacy model;
 - determine whether the system has sufficient capacity to meet demand on an hour by hour basis, at the points of system stress; and
 - this quantifies how often system stress events occur, the extent to which system stress occurs, what times of the day stress occurs, etc., which allows conclusions to be drawn on whether the current Planning Criterion is adequate and the types of products that will be needed in the future.
- Mr Bowmaker reviewed the scenarios that had previously been agreed by the RCMRWG for 2022, 2030 and 2050.
 - Mrs Bedola asked whether additional wind and solar capacity is assumed to generate the hydrogen for scenario 3 and whether higher load was assumed for the creation of the hydrogen. Mr Bowmaker indicated that no specific technology assumptions were made – specific wind or solar capacity to generate hydrogen was not part of the results, nor was load for hydrogen generation.
 - In response to questions from Mr Price, Mr Bowmaker indicated that:
 - behind the meter generation goes into the operational load forecast; and
 - no assumptions have been made around virtual power plants and how they are used.
- Mr Bowmaker presented the initial modelling results (slide 10) and the key findings in terms of capacity additions (slide 11).
- Mr Bowmaker presented the key finding in terms of minimum demand (slide 12).

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	 In response to a question from Mrs Bedola, Mr Bowmaker indicated that the negative load results indicate load before accounting for demand flexibility and storage. 	
	 Mr Schubert noted that the SWIS has had peak demand greater than 4,000 MW in several years and asked why this does not seem to occur in the results. Mr Bowmaker indicated that high peaks do not appear because the results are an average load profile, and the final modelling will use a Monte Carlo simulaion approach with a number of different demand shapes to address extreme peak demand. Mr Schubert pointed out that these peak events would show what capacity is required. 	
	 In response to a question from Mr Higgins, Mr Bowmaker acknowledged that the system stress modelling only considers what generation capacity is required and that economic modelling will be done in the next stage. 	
	 In response to a question from Mr McKinnon, Mr Bowmaker indicated that negative operational load indicates periods where the market operator will need to find ways to absorb the additional energy in terms of bringing in batteries or demand side management. 	
•	Mr Bowmaker presented the key finding in terms of demand shape, (slide 13).	
	 Mr Schubert suggested that the demand profile will be flatter if retail tariffs are structured properly, and incentives are put in place for electric vehicles (EVs). Mr Bowmaker indicated that the modelling accounted for EV charging, which tends to be in the evening – this pushes the peak later in the day and leads to a broader peak, but the duck curve shape does not disappear. 	
•	Mr Bowmaker presented the key finding in terms of timing of firming resources (slide 14).	
	 Ms White pointed out that the modelling shows that unserved energy still occurs in the traditional peak periods, which is usually due to insufficient capacity, and indicated that she had expected that unserved energy in the future would be caused by low load and instability leading to system black or partial system black events. Ms White asked whether the modelling indicates that there are no low load issues that would lead to unserved energy? 	
	 Mr Bowmaker indicated that the model identifies unserved energy that is caused by a shortage of capacity, not things happening as a result of system stability issues. 	
	 Ms White asked whether this definition is appropriate going forward and raised the question of whether flexibility should be considered in the RCM. 	

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	 Mr Robinson indicated that issues associated with low load are addressed later in the agenda and suggested to return to the issue at that time. 	
	 Mr Bowmaker pointed out that the broader peak that is expected by 2050 suggests that unserved energy could occur as late as 10:00pm, so the hours over which capacity services are defined may need to be extended. Mr Robinson suggested that, alternatively, it may need to be ensured that the capacity is available in all of the peak hours. 	
	 Mrs Papps asked how this relates to 14-hour fuel requirement for Scheduled Generators and whether fuel requirements are only needed in the five hours in the back half of the day. Mr Robinson acknowledged that it could be argued that the critical period is shorter than 14 hours. The Chair suggested that fuel requirements will be considered when assessing the methods to assign Certified Reserve Capacity. Mr Robinson suggested that fuel requirements should be discussed later when discussing ramping and flexibility. 	
	 Mr Price asked whether the fleet assumptions will drive the types of unserved energy experienced – for example because reliance on storage pushes unserved energy to later in the day. Mr Price indicated that he had envisaged that a base case for the characteristic of demand would be developed and used to assess what types of fleet capabilities achieve certain levels of unserved energy. Mr Robinson clarified that this was why different scenarios were modelled. 	
•	Mr Bowmaker presented the key finding in terms of timing of demand ramping (slide 15).	
	• Mr Bowmaker indicated that:	
	 the modelling showed that much higher demand ramping rates are required as the demand shape changes in the later years – about 2,000 MW/h by 2050 (about three times the current rate); and 	
	 the ramping is well within the capabilities of current technologies like open cycle gas turbines (OCGTs) and batteries, but options to address ramping will be more limited with the zero carbon emissions policy, which will rule out OCGTs. 	
	 In response to questions from Mrs Bedola and Mr Stephens, Mr Bowmaker clarified that the model does not assess intra- interval ramping because this is a function of the ESS market and not the capacity mechanism. 	
	 Mrs Bedola asked whether the ramping issues are driven by renewables or load? Mr Bowmaker indicated that it is a 	

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	combination of what is going on behind the meter and the volatility of wind and solar.	
	 Mr Bowmaker presented the key finding on the methods of measuring unserved energy (slide 17). 	
	 Mr Bowmaker pointed out the different ways to measure unserved energy: 	
	 unserved energy as a percentage of total load (EUE%); 	
	 loss of load hours (LOLH); and 	
	 loss of load events (LOLEv). 	
	 Mr Bowmaker pointed out that the different scenarios resulted in different types of unserved energy in terms of EUE%, LOLH and LOLEv, which will be important when it comes to discussions on the Planning Criterion. 	
	 Mr Tayal asked whether the modelling showed any events with a continuous number of hours of unserved energy that would match the expected MWh profile of batteries or other storage technology that is required in 2030 or 2050? Mr Bowmaker indicated that RBP can present this information. 	
	 Mr Price asked if the modelling accounts for extreme scenarios, such as multiple days with a lack of wind or low irradiance. 	
	Mr Bowmaker clarified that the initial results presented are based on hour-by-hour modeling of averaged demand but that the final results will be based on a Monte Carlo simulation approach, modelling all actual traces available and considering many different scenarios, including extreme weather events.	
	Mr Higgins asked if the modelling had assessed whether sufficient Scheduled Generation will be available in 2030. Mr Robinson clarified that this was the case, based on the current plan for generator retirements.	
	ACTION: RBP is to provide information to the RCMRWG on how the number of continuous LOLH matches against battery profiles.	RBP
7	Capacity Services	
	Mr Bowmaker and Mr Robinson presented the initial assessment of the capacity services needed in the SWIS in slides 19 to 23. The discussion was as follows:	
	• Mr Bowmaker presented the initial key findings of the assessment of the characteristics of the capacity needed in the SWIS (slide 19).	

- Mr Bowmaker confirmed that, at this point, the model has not identified any ramp rates that cannot be addressed by the available essential system services (ESS).
- Ms White questioned how capacity characteristics beyond a simple MW requirement can be incentivised, considering that the Reserve Capacity Price is out of scope for the review. Ms

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	White considered that, without changing the Reserve Capacity Price it will be difficult to incentivise different capacity products, such as capacity from different technology types and in different locations.	
	Ms White emphasised that incentives for having capacity in different locations on the network is important to increase the resilience of the system.	
	Mr Robinson clarified that the capacity needed in future will not be solely defined by peak demand but also by other characteristics, such as ramping capabilities. Mr Robinson noted that the option to address the ramping needs through the RCM are discussed later in the presentation. Mr Robinson noted that there are different ways to address the needed characteristics that are in scope of the RCM Review, such as different capacity classes or methods for assigning Certified Reserve Capacity (CRC).	
	Mr Robinson noted that the results indicate that there will be a need in the future for capacity to be more flexible and available over a wider range of hours than currently needed. Currently, different requirements for availability apply to different technology types with Scheduled Generators being the only facilities that must be able to respond at any time. In the future, it will be important that all facilities can respond in a wide range of hours.	
	Mr Price considered that it may be beneficial if the RCM takes system resilience into account by setting appropriate minimum standards in the allocation of CRCs.	
	 Ms White noted that Electrical Storage Resources only have to be available for four hours. 	
	 Mr Robinson noted that the objective is to find a technology neutral approach by defining the system need and the product to address it. Mr Robinson noted that the RCM Review is aiming to identify a common approach for certifying different technologies. 	
	Mrs Papps supported simplifying/rationalising the methods for assigning CRC and noted that the current regime is extremely complex, which has the potential to discourage investment.	
•	Mr Robinson presented the initial assessment on whether flexibility should be addressed through the RCM (slide 20).	
	 Mr Robinson noted that the initial results show that, by 2050, the demand ramp rates exceed 2 GW / hour and that the resulting need for load shaping will dominate the need for firming capacity. Mr Robinson noted that this need for fast ramping capacity can be addressed in different ways: 	
	 as a specific capacity product with a specified target; 	

ltem	Subject	Action
	 as a specific class for capacity therefore gets capacity allocate and/or 	-
	 address flexibility through the E RCM. 	SS market rather than the
	Mr Robinson noted that demand sid addressing the issue, but in order to will need to be changed.	o 1
	Mr Shahnazari considered that, if ra considered as a separate product of demand curve might be separate to product and based on its supply cos Therefore, this becomes a separate Mr Shahnazari considered that com separation of prices should be cons designed carefully, it is likely to diste adequacy and ramping flexibility set system requires a system adequacy flexibility, or vice versa, a single pric distort the signal for each service to	r 'class', its pricing and the system adequacy at and benefit to the system. service itself. bining the services without idered with caution. If not ort price signals for system rvices. If, in the future, the product but not ramping the for both services may
	Mr Peake suggested that system ac should be sought separately. Howe capacity need then both system ad be sought in a combined process s be optimised.	ever, if ramping is driving the equacy and ramping should
	 Mrs Bedola considered that the mar encourage the right generation mix. the energy and ESS market together that encourages investment in the s 	, Therefore, the RCM and r must provide the revenue
	Mr Shahnazari noted that the rules a of fast ramping services through the Mr Robinson agreed that fast rampi distinct service in the ESS market a is whether inclusion in the ESS mar the required investment in fast ramp	already allow procurement ESS market. ng can be included as a nd noted that the question ket is sufficient to ensure
	 Mr Robinson confirmed that the rule service to be procured through the S System Service Mechanism (SESS is identified for the short term. 	Supplementary Essential
	Ms White cautioned against the buil administrative mechanisms to avoid Ms White considered that the market incentivise the needed services and such as the SESSM should only be	impeding competition. et should be designed to administrative mechanisms

ltem	Subject	Action
	Mrs Papps, Mrs Bedola, Ms Ng, and Mr Peake supported Ms White's comment.	
	 Mr Shahnazari suggested that fast ramping capacity could be procured through its own mechanism, similar to the RCM, instead of including the procurement in the RCM. 	
	 Mrs Bedola noted that the setting of the Electric Storage Resource Obligation Intervals limits how to operate batteries in the time before those intervals. 	
	 Mr Price noted that AEMO is developing options to incorporate ramping (Operating Reserve) in the NEM and suggested to consider how this is proposed to be designed and integrated into any capacity mechanism that is introduced in the NEM. 	
	Mrs Papps noted that the Australian Energy Market Commission's (AEMC) rule change about ramp rates in the NEM has been deferred until June 2023 to wait for the outcome of Energy Security Board's (ESB) work on the capacity mechanism.	
	 Mr Robinson clarified that the modelling suggests that the fast- ramping needs in the WEM can be addressed by existing technology but the question is how to encourage a sufficient amount of the required capabilities. Mr Robinson noted that the next steps of the RCM Review will include a more detailed assessment of whether the existing market mechanisms encourage sufficient fast-ramping capacity or if additional incentives are needed. 	
	 Mr Robinson indicated that, based on the RCMRWG's discussion, it will be worth investigating whether capacity classes can be used to address the need for fast-ramping capacity. Mr Higgins supported this approach. 	
•	Mr Robinson presented the initial assessment of whether the low load issue should be addressed through the RCM (slides 22 and 23).	
	 Mr Robinson noted that, to address the low load through the RCM: 	
	 a 'reverse capacity' product would be needed, assigning credits for the capability of increasing load or decreasing generation; and 	
	 an additional planning criterion would be needed for such a service. 	
	Mr Robinson noted that the initial results indicate that such a service may be needed around 25% of the Trading Intervals by 2050 which is significantly more than the Trading Intervals where a capacity service is needed.	
	 There was discussion about whether consumers should have the right to spill energy into the system at any time. 	

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	 Mr Stevens considered that allowing distributed energy resources (DER) to spill energy into the system at any time and potentially paying them for not spilling at times poses a risk to investors in larger scale generation. Mr Stevens considered that DER generation should have to register to obtain the right to spill into the system. Ms White supported Mr Stevens' comments. 	
	 Mrs Bedola noted that restricting consumers from spilling energy into the system may result in consumers disconnecting from the network. 	
	 The Chair noted that whether generation from DER should be restricted was considered by the DER Roadmap and is not in scope of the RCM Review. 	
	 Mr Huxtable considered that investment in large scale capability to increase load requires multiple years of lead time and significant capital expenditure. 	
	 Mr Peake considered that a lot of money is spent on enabling the absorption of DER and cautioned that increasing prices for consumers by too much could threaten the energy transformation and lead to support coal fired generation. 	
	 Mr Shahnazari considered that there should be a framework for deciding which services should be part of the RCM and which should not. For example, what makes us to consider ramping flexibility can be included in the RCM, but not other ESS services? 	
8	Planning Criterion	
	Mr Robinson presented the conclusions about the assessment of the Planning Criterion based on the initial results and the international review (slides 25 to 27). The discussion was as follows:	
	 Mr Robinson noted that: The international review suggests keeping the two-limbed Planning Criterion. 	

- The system stress modelling indicates that EUE% should be retained as one of the limbs of the Planning Criterion.
- The initial results indicate that there is no benefit in using both LOLH and LOLEv as system stress measurements for the Planning Criterion.
- The initial results showing a small number of short and small outages indicate that it will be more appropriate to use peak load or LOLEv and not LOLH as the second limb of the Planning Criterion.
- Further modelling should inform whether peak load or LOLEv are more appropriate measures for the second limb of the Planning Criterion.

Item	Subject	Action
•	Ms White asked whether there is any policy direction for the reliability target. Mr Robinson clarified that the assessment of the Planning Criterion includes a cost-benefit analysis to assess the trade-off between	
	higher reliability requirements and costs, noting the requirement that the current reliability standard should not be eroded.	
•	Mr Schubert asked if the modelling differentiates between long- and short-duration storage.	
	Mr Bowmaker clarified that the modelling assumes that the Electrical Storage Obligation Intervals would span four hours. Mr Bowmaker noted that the modelling to date was an hour-by-hour assessment and therefore not assessing when electrical storage resources (ESR) are charging over time, but that this will be assessed in the next round of modelling.	
•	Mr Peake considered that the public would be most upset by deep outages and that regular but small outages can be spread around so no one customer is greatly affected.	
•	Mrs Papps noted that Alinta Energy broadly supports the retention of a two-limbed Planning Criterion and asked how this will affect the fuel requirement for Scheduled Generators. Mrs Papps noted that the weakness of the current Planning Criterion is that it doesn't set an evidence-based period for how long capacity should be available.	
	Mr Peake noted that the fuel requirement for Scheduled Generators will become a big issue if there is an increase in reliance on DSPs and the question is what availability DSPs will have to provide.	
	The Chair noted that the fuel requirement will be considered when assessing the methods for assigning CRC.	
•	Mr Robinson noted that even if the Planning Criterion is to be retained, the following aspects need to be addressed:	
	 the reserve margin will need to be assessed to account for the largest contingency, which also sets the need for Spinning Reserve, and the largest contingency is now a network outage combined with the loss of generation from DER, not failure of the largest generator; and 	
	 whether CRC should be assigned based on the installed capacity (ICAP) or the unforced capacity (UCAP). 	
•	Mr Shahnazari referred the RCMRWG to the ERA's discussions in relation to the reserve margin in the following two publications:	
	 Rule Change Proposal for the review of the Relevant Level Methodology, page 42;¹ and 	
	ne Rule Change Proposal is published on the Coordinator's website: <u>Rul</u> <u>03 (www.wa.gov.au)</u>	<u>le Change</u>

ltem	Subject	Action
	 2020 Review of two market rules intended to incentivise the availability of generators, p. 16-17,65.² 	
	 Mr Shahnazari noted that keeping a two-limbed Planning Criterion has implications on the capacity value because Facilities may contribute differently to the two limbs. 	
	 Mr Higgins asked whether schedulable and non-schedulable generation should be separated into different availability classes. 	
	Mr Robinson noted that this will be considered when assessing the methods for assigning CRC.	
9	Support for Preliminary Directions	
	The RCMRWG supported the preliminary directions.	
10	Next Steps	
	Mr Robinson noted that the next step is modelling the alternative planning criteria and assessing the effect on the capacity target and system reliability.	
	The next RCMRWG meeting in June 2022 to discuss:	
	 final results for the assessment of capacity services and the Planning Criterion; and 	
	CRC allocation approaches.	
	The Chair invited RCMRWG members to provide out of session comments on the system stress modelling and the preliminary directions for the planning criterion by 13 May 2022.	
	Ms White suggested that any out of session comments on the presented material should be consolidated and included in the papers for the next RCMRWG meeting. The Chair noted that how out of session feedback will be reported back to the RCMRWG will depend on the nature of the feedback.	
	ACTION: RCMRWG members are to provide any further feedback and comments on the system stress modelling and the preliminary directions on the planning criterion to the RCMRWG secretariate.	RCMRWG members (13/05/2022)
11	General Business	
	No general business was discussed.	
The meeting closed at 11:30am.		

² The report is published on the ERA's website: <u>2020 Review of Incentives to Improve Availability</u> of Generators - Economic Regulation Authority Western Australia (erawa.com.au)