Department of Energy, Mines, Industry Regulation and Safety
Energy Policy WA
GOVERNMENT OF WESTERN AUSTRALIA

The Wholesale Electricity Market Investment Certainty Review (Initiatives 1 and 2)

Consultation Paper

15 August 2024

Bluewaters Power

Public submission

Executive Summary

The Reserve Capacity Mechanism (RCM) has played a central role in Western Australia's Wholesale Electricity Market (WEM) across cycles featured by excess generation capacity to shortfalls; rapid transition from centralised to decentralised energy resources; significant technological innovation and disruption; along with rising consumer expectations for a secure, reliable and affordable energy transition to a net zero greenhouse gas future.

The process of reform has been long and extensive, though possibly out-run by the above factors:

- 2012/13: The RCM Working Group adopted the Lantau Curve[1] following a year of deliberation.
- 2018/19: The 'Improving Reserve Capacity Pricing Signals' reform expended a great deal of time and energy modifying the Lantau Curve.
- 2024: The WEM Investment Certainty Working Group is currently proposing further complex modifications of the Reserve Capacity Price (RCP) curve.

The RCM's original intent to simulate a 'reserve trader' mechanism, whereby it would ensure sufficient procurement of dispatchable capacity required for a 1-in-10-year peak demand, has proven difficult to successfully implement given the market trends and factors outlined above. The resulting WEM design has resulted in the RCM pervading many aspects of the WEM rules; from setting retailer Individual Reserve Capacity Requirements (ICRC) obligations through to managing generator performance, even for generators not reliant on capacity credits such as base load coal-fired and gas-fired generation. As the latter are reliant on long-term bilateral contracts, reforming the RCM has been fraught given the wide-ranging implications, contractual obligations and self-interests.

Therefore, the WEM has undergone such a fundamental change in the nature of energy supply and demand, the original design of the RCM is now inadequate to perform its intended function. While this submission provides feedback on the proposed changes to the RCP curve, its overarching recommendation is that the current WEM reform program is paused until a new market design and associated rules (or 'target operating model') can be clearly articulated and costed.

[1] https://www.lantaugroup.com/files/ppt_wa_mtt.pdf

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1. Background

Bluewaters Power Station (Bluewaters) is the only privately-owned, coal-fired power station in Western Australia. Located 4.5km northeast of Collie, the two 217MW units deliver electricity to WA's Wholesale Electricity Market (WEM); Bluewaters Unit 1 currently delivers the majority of its output to support the reliable baseload requirements of Boddington Gold Mine (BGM) via a bilateral Power Purchase Agreement (PPA), with surplus production supporting the reliability and security of the WEM[2]; Bluewaters Unit 2 currently delivers all of its electricity production to Synergy via a PPA. Bluewaters Units 1 and 2 together deliver over 15% of WA's electricity supply from assets that are one of the lowest-cost producers in the WEM, currently delivering electricity at prices lower than Synergy's Standard Products[3].

The electricity industry in South West Interconnected System (SWIS) is in a dynamic state of transition, featured by increasing penetration of intermittent renewable generation and short duration energy storage. As the ultimate just-in-time industry, where supply and demand must instantaneously balance, dispatchable generation such as Bluewaters Units 1 and 2 are critical to maintaining a reliable electricity supply.

Bluewaters' power station assets have a very important role to play in the WEM and therefore the importance of achieving high levels of availability is a priority. To achieve this, Bluewaters is continuously improving its asset management capability and ensuring Bluewaters' values its most important assets – Bluewaters' employees, key contractors and the local community. In this regard, Bluewaters acknowledges the Traditional Custodians of the land on which it operates, the Wiilman and Kaneang people of the Noongar Nation, and pays its respects to Elders past, present and emerging.

1.1. Context

Electricity markets around the world are attempting to manage the transition to net zero emissions energy sectors with mixed success. The South West Interconnected System (SWIS) continues to experience a significant uptake of Distributed Energy Resources (DER) and firming technologies such as Electric Storage Resources (ESR), however the approval and development of large scale wind generation continues to lag due to:

- The increasing complexity and rate of change in market design (implemented 1 October 2023);
- Gaining access to the Western Power network; compounded by
- The absence of a clearly articulated and costed 'target operating model' for the WEM.

[2] https://brightsourceconsulting.com.au/wp-content/uploads/2023/08/July-2023-Gas-Market-Update-final.pdf
[3] Standard Products Homepage - Standard Products (synergy.net.au)

Several important assumptions underpinning the SWIS Demand Assessment, released by the Minister for Energy (Minister) have changed since publication on 9 May 2023, most notably the moderation of interest/demand from green hydrogen, green steel and minerals production in the SWIS[4].

The electricity supply mix in the SWIS and other jurisdictions is not changing as fast as originally planned, with the planned exit of baseload coal generators being deferred due to the delayed entry of utility-scale renewable generation (wind and solar). The rapid uptake of ESR is the exception, stimulated by direct intervention by the Australian Energy Market Operator (AEMO), effectively acting as a single-buyer and underwriter these investments and services. That is, these investments have not been driven by competitive market forces and therefore will likely result in higher costs for consumers than otherwise the case. The implications for Cost of New Entry (CONE) assumptions in the current capacity pricing ('offer') model and proposed amendments to the Reserve Capacity Price (RCP) curve is discussed in more detail below.

The significant investment in transmission networks, utility-scale renewable generation and ESR required in the SWIS is likely to stretch well into the 2030's. Pragmatic policy solutions are therefore required to ensure reliable, affordable and environmentally responsible electricity supply is available to support the economic competitiveness and attractiveness of the SWIS.

One of the consequences for policy makers to consider has been summarised by Australia's former Chief Scientist, Alan Finkel:

> *Coal-fired plants have no future, but shutting them down before the firmed solar and wind generation plants are built would risk extended electricity blackouts. That would not just be a disaster for modern life; it risks rescinding the social licence for moving as fast as we can to net zero.*[5]

While the Coordinator of Energy (Coordinator) has carried out a number of electricity market reviews since the start of 2022, along with highlighting the need for further WEM reforms, the absence of clearly articulated and costed 'target operating model' for the WEM and the SWIS may result in further delays for WA's critical energy transition. In addition to decreasing economic competitiveness in the near term, longer terms consequences could include the ability of the WA Treasury Corporation to issue "green" and "sustainable" bonds to the world's financial markets, at competitive rates, as part of efforts for WA to reach net zero by 2050[6].

1.2. Purpose of this submission

The purpose of this submission is to:

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[4] BHP to close Nickel West mines until 2027, blaming global oversupply of nickel - ABC News
[5] 'Powering Up: Unleashing the clean energy supply chain', Alan Finkel, 2023
[6] WA efforts to raise debt in environmental, social-friendly markets labelled 'greenwashing' - ABC News

(1) Highlight prevailing operational and economic challenges across the SWIS and within the WEM, in turn opening the door for an authentic review and credible reassessment of the current pathway for WEM reform; and
(2) Provide specific feedback on **Initiative 1** and proposed changes to the **RCP Curve**, in the event that the proposed WEM reforms continue to be progressed.

Bluewaters recommends that policy-makers consider transitioning the WEM from the current capacity pricing ('offer') model to a capacity auction ('quantity') model, including the articulation and costing of a 'target operating model' that will ensure a secure, reliable and affordable energy transition across the SWIS. Therefore, Bluewaters can provide 'in principle' and/or explicit support to some of the Proposals with rationale provided in Table 2 below.

2. The Reserve Capacity Price curve

The WEM Investment Certainty Review Consultation Paper concludes:

> *As such, it is not clear that the proposed changes in the RCP curve would be sufficient – on their own – to drive the necessary investment in the SWIS. The changes must be considered in context of the wider investment landscape. Consumer representatives on the WICRWG expressed concern that increased RCP prices could see a rise in consumer bills over the medium term.*[7]

This follows the 2018 review of the RCP curve by the then Public Utilities Office (PUO), deciding to continue the administered pricing approach with an amended RCP curve, rather than replacing it with a capacity auction ('quantity') model or a reliability obligation[8]. The primary problem attempted to be addressed by the PUO at that time "had been a tendency toward significant over-procurement of capacity, with the level of excess capacity over the market requirement reaching 23 per cent by 2016-17, at an estimated cost to electricity consumers of around $116 million"[9]. The subsequent reduction in capacity to 4 per cent in the 2018-19 Capacity Year was pronounced, though with significant unintended consequences[10] including the current forecast supply-demand deficit.

Therefore, a more pragmatic approach may be required based on international precedents and case studies, to avoid the unintended consequences of (1) installing too much capacity, (2) creating uneconomic rents and increased costs to consumers, and (3) further delaying investment in utility-scale renewable energy generation.

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[7] the_wholesale_electricity_market_investment_certainty_review_initiatives_1_and2_consultation_paper.pdf (www.wa.gov.au), page 24.
[8] Draft Recommendations Report - Improving Reserve Capacity pricing signals – a proposed capacity pricing model (www.wa.gov.au)
[9] Ibid 5
[10] Beware Of The "Cobra Effect" In Business (forbes.com)

1.3. International scan versus the WEM

Ireland is possibly the most relevant case study for the WEM based on market size, renewable penetration and system design and planning challenges[11][12], somewhat differentiated by a 500MW interconnection with Great Britain (planned to increase to 1GW[13]) and a capacity auction ('quantity') model:

Table 1: Comparison of EPWA case studies with the WEM

Jurisdiction	Annual electricity production	Top two generation types	Interconnection	Capacity Auction
Colombia[14]	84 TWh	72% Hydro 16% Natural Gas	Yes	Yes
Ireland[15]	34 TWh	49% Natural Gas 33% Wind	Yes	Yes
ISO-NE	115 TWh	55% Natural Gas 23% Nuclear	Yes	Yes
Japan[16]	1,012 TWh	33% Natural Gas 31% Coal	No	Yes
NYISO[17]	136 TWh	44% Natural Gas 30% Nuclear	Yes	Yes
Ontario[18]	143 TWh	51% Nuclear 25% Hydro	Yes	Yes
PJM[19]	806 TWh	44% Natural Gas 33% Nuclear	Yes	Yes
UK[20]	323 TWh	39% Natural Gas 25% Wind	Yes	Yes
WEM[21]	17 TWh	38% Natural Gas 27% Coal	No	No

There also appears to be correlations between forecast supply-demand balances in AEMO's most recent forecast for capacity in the WEM and EirGrid's forecast for Ireland:

[11] 'Heads must roll': Industry and experts argue energy crisis of 'our own making' (thejournal.ie)
[12] EirGrid SONI GCS 2023-2032
[13] Electricity Market Report 2023 (iea.blob.core.windows.net)
[14] https://www.iea.org/countries/colombia/electricity
[15] https://www.iea.org/countries/ireland/electricity
[16] https://www.iea.org/countries/japan/electricity
[17] https://www.energy.gov/sites/prod/files/2016/09/f33/NY_Energy%20Sector%20Risk%20Profile_0.pdf
[18] PJM System Mix (pjm-eis.com)
[19] PJM Learning Center - Generation Sources
[20] https://www.iea.org/countries/united-kingdom/electricity
[21] Fact Sheet: Wholesale Electricity Market (aemo.com.au)

Figure 2. AEMO's forecast of supply demand balance in the WEM, 2024-25 to 2033-34 (MW)[22]

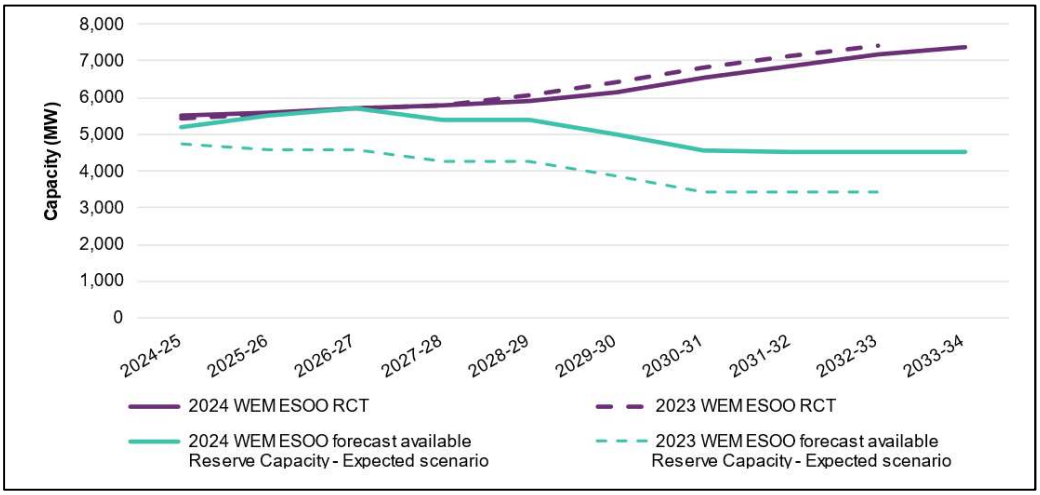
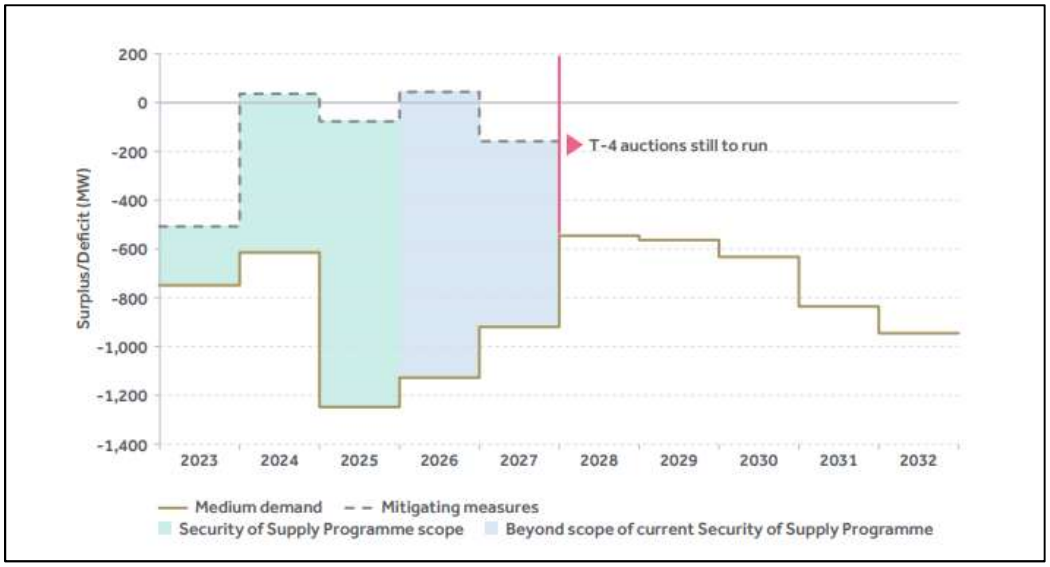


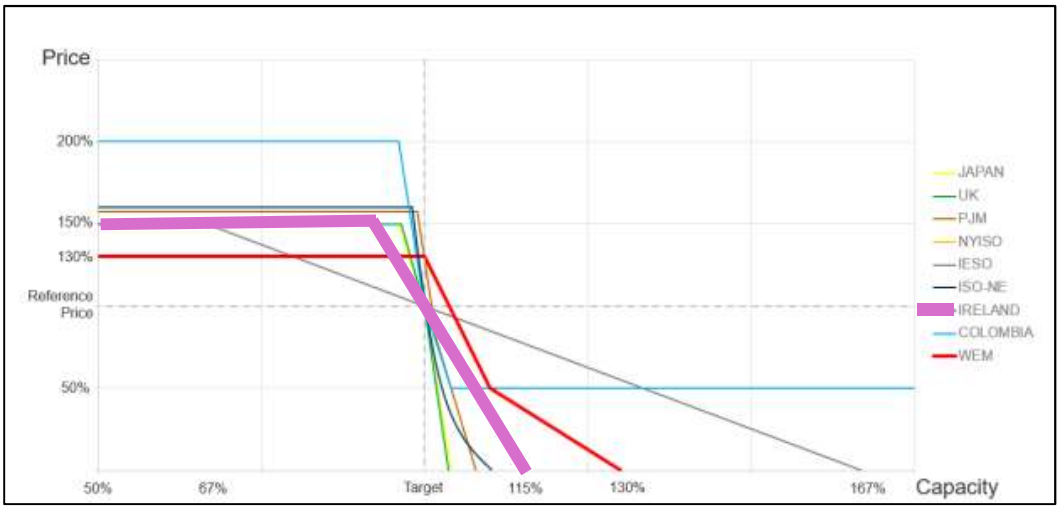
Figure 3. EirGrid's forecast of supply-demand balance in Ireland, 2023-2032 (MW)[23]



Other than large forecast supply-demand deficits, measures put in place by Ireland appears to be reducing their deficit whereas the WEM's deficit continues to increase, lending weight to the use of Ireland's RCP curve and other related market reforms:

[22] 2024-wem-electricity-statement-of-opportunities.pdf (aemo.com.au)
[23] Ibid 10.

Figure 1. International Reserve Capacity Price curves[24]



The AEMC has also reviewed global debate on how to deliver long-term reliability in systems with deep penetration of renewables:

> *The choice of market design has little influence over the impact of policies and costs. Markets will reflect the costs flowing from consumer choices and government policies. The global debate today is exploring more effective and less costly options in which governments coordinate and size emissions policies that encourage a pace of change that both supports market-led investment responses to reliability concerns and minimises the amount of central intervention required to then slow it (eg delay thermal retirement).*[25]

While AEMC's observation that the "missing link is properly integrated government policies" may be in the process of being addressed at a Federal and State level, the observations summarised above may lead to the conclusion that Energy Policy WA, AEMO and Market Participants need to work together to design an agreed 'target operating model' for the WEM; that is a fit-for-purpose and pragmatic model that supports continued investment in and economic development of the SWIS. Given the predominantly bi-lateral nature of electricity trading in the WEM[26] along with rapid (unplanned) technological disruption, it may be prudent to investigate alternative, simpler market governance, regulation and administrative structures.

While the focus of this submission is on Initiative 1 and the RCP Curve, the effectiveness of this and other proposed WEM reforms may be limited if they are not relevant to the core issue; that is, the WEM may be too small and isolated to benefit from applying 'global best practice' that are only applicable to large, mature markets featured by large interconnectors and capacity auction ('offer') models.

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[24] Ibid 1
[25] Profiling the capacity market debate | AEMC
[26] wem-reform-market-design-summary.pdf (aemo.com.au)

The ability to incorporate lessons from energy transitions elsewhere while ensuring that "the market mechanism used to dispatch and operate generation units is consistent with how the grid is actually operated"[27], is critical. For example, given forecast significant shortfalls in supply-demand forecasts and delay of new investment in renewable generation, an investigation of a 'strategic reserve' in the WEM could also be prudent immediate step:

> *Germany had considered and chosen not to implement a full capacity market but argued instead that a "strategic reserve" was necessary to accompany the country's transition to renewables and phase-out from nuclear power. The German scheme received clearance by the European Commission in February under the EU's state aid rules.*[28]

More broadly, a viable and pragmatic market design or target operating model suitable for the WEM could be a 'cost-based short-term market' that uses locational marginal pricing (LMP)[29]. This would involve solving for the optimal dispatch of generation units in the region based on the market operator's estimate of each unit's variable cost subject to the operating constraints implied by the actual regional transmission network and other reliability constraints:

- Market participants would need to declare the available capacity of each of the units it owns to the market operator.
- The market operator would compute the LMPs and dispatch levels for each generation unit given the realised demand at each point of withdrawal from the transmission network for each hour of the following day.
- Eliminates the need for a local or system-wide market power mitigation mechanism and the associated regulatory burden as cost- rather than offer-based.
- To ensure long-term resource adequacy (capacity), retailers would be required to purchase forward contracts for energy at various horizons to delivery equal to pre-specified fractions of their realized demand or face a financial penalty for under procurement.
- This market design allows easy transition to an offer-based market once the transmission network in the SWIS is sufficiently expanded, technology costs better understood and decarbonisation policy settings post-2030 known.

The cost-based LMP market design appears to be well-suited for integrating any amount of intermittent renewables into the WEM, coupled with incorporating additional constraints into the region's LMP market and the introduction additional products to deal with the increasing share of intermittent renewable resources[30]. While 'unscrambling the egg' and transitioning to a simpler market operation and

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[27] Microsoft Word - wolak_November_2019.docx (stanford.edu)
[28] Ibid 22
[29] Ibid 24
[30] Ibid 24

governance model may involve writing down of sunk investments, this is likely to be significantly outweighed by improvements in system security, reliability and affordability.

1.4. Proposed Reserve Capacity Price curve

Bluewaters responses to Proposals for Initiative 1 are detailed in Table 2 below. As noted above, Bluewaters recommendation is to transition the WEM from the current capacity pricing ('offer') model to a more pragmatic capacity auction ('quantity') model. Therefore while Bluewaters cannot explicitly support the proposed changes to the RCP curve, it can provide 'in principle' and/or explicit support to some of the Proposals.

Table 2: Stakeholder feedback on Initiative 1

Proposal		Consultation question		Stakeholder feedback
1	Set the Peak RCP to 100% of the Peak BRCP if the number of Peak Capacity Credits issued equals the Peak RCT.	**1**	Do stakeholders support setting the price to the BRCP at the RCT? If you have any concerns, please outline your reasons.	Not supported in principle; however if the current proposal progresses, the ESR-based BRCP should be periodically reviewed to assess the option to introduce new technology at lower a BRCP to prevent "an excessive Net CONE distorts the shape of the demand curve that PJM uses in its capacity market, causing PJM to procure too many resources at too high a price, with obvious detrimental consequences for consumers."[31]
2	Set the Peak RCP to 100% of the Peak BRCP when the number of Peak Capacity Credits provided is between 95% and 105% of the Peak RCT.	**2a**	Do stakeholders support including a deadband in the Peak RCP curve?	Not supported in principle; however if the current proposal progresses, more thorough economic analysis be undertaken based on the >2000MW of proposed or committed ESR (and associated costs[32]) in conjunction with the GW's of proposed wind generation across the SWIS. This analysis should include the pragmatic next best alternative (that is, a capacity auction model).
		2b	Do stakeholders support the proposed settings for the deadband?	Not supported in principle; however if the current proposal progresses, more thorough economic analysis be undertaken based on the >2000MW of proposed or committed ESR in conjunction with the GW's of proposed wind generation across the SWIS. This analysis should include the

[31] Profiling the capacity market debate | AEMC
[32] AEMO | Expressions of Interest and Tender for NCESS – Reliability Services 2025-27 (WA)

Proposal		Consultation question		Stakeholder feedback
				pragmatic next best alternative (that is, a capacity auction model).
3	Set a maximum Peak RCP at 150% of the Peak BRCP, when the number of Peak Capacity Credits issued is 85% of the Peak RCT	**3**	Do stakeholders have any concerns about the proposed parameters for the Peak RCP cap?	Not supported in principle; however if the current proposal progresses, more thorough economic analysis be undertaken based on the >2000MW of proposed or committed ESR in conjunction with the GW's of proposed wind generation across the SWIS. This analysis should include the pragmatic next best alternative (that is, a capacity auction model).
4	Set a minimum Peak RCP at 50% of the Peak BRCP, when the number of Peak Capacity Credits provided is greater than or equal to 115% of the Peak RCT.	**4a**	Do stakeholders support a non-zero RCP floor?	Not supported; An RCP floor of zero meant will result in dampen investment signals as the risk-premium and expected return on invested capital / equity will increase due to the expected worst-case scenario (that is, zero capacity payments). A fixed-term RCP negotiated based on project type (for example, firmed/baseload or intermittent) would significant improve investment certainty, particularly if the project is funded by project structured finance.
		4b	Do stakeholders consider that a non-zero RCP floor should be recalculated each year or set based on a fixed proportion of the BRCP?	Not supported; The BRCP will likely change significantly over time and dampen investment signals per rationale in 4a above.
		4c	Do stakeholders consider that a non-zero RCP floor should allow for principal repayments, interest payments, or be symmetrical with the RCP cap?	Not supported in principle; however if the current proposal progresses, the RCP floor based on debt-servicing costs. That is, payments of interest and principal for the portion of capital costs funded by debt. This would translate to a RCP floor of around 30% of the BRCP to cover both interest and principal payments.
5	**5.1** Allow any new facility that provides Flexible Capacity to receive (on request) a fixed RCP for ten years. **5.2** Set a maximum Flexible RCP at 160% of the Flexible BRCP, when the number of Flexible Capacity Credits issued	**5a**	Do stakeholders support a higher RCP cap for Flexible Capacity than Peak Capacity?	Not supported in principle; however if the current proposal progresses, Flexible Capacity should receive a higher RCP cap, set for 10 years via negotiation, than Peak Capacity in order to stimulate required investment to close the current and future shortfalls in supply.
		5b	Do stakeholders consider that the Flexible RCP curve should have a deadband?	Not supported as adds unnecessary complexity to an already overly-complex model given the relatively small size of the WEM.

Proposal		Consultation question		Stakeholder feedback
	is 85% of the Flexible RCT. **5.3** Set the Flexible RCP to 100% of the Flexible BRCP where the number of Flexible Capacity Credits issued is 100% of the Flexible RCT. **5.4** Set the minimum Flexible RCP on the same basis as the Peak RCP.	**5c**	Do stakeholders consider that Flexible Capacity should have a non-zero RCP floor?	Not supported as adds unnecessary complexity to an already overly-complex model given the relatively small size of the WEM.
6	Include a review of the RCP curves in the Coordinator's regular review of the BRCP reference technology.	**6**	Do stakeholders agree that the RCP curves should be considered in conjunction with the BRCP reference technology? If you have any concerns, please outline your reasons.	Not supported in principle; however if the current proposal progresses RCP curves should be considered in conjunction with a review of the BRCP reference technology to ensure accurate pricing and technological relevance.
7	**7.1** Adjust existing transitional pricing arrangements to include a lookback adjustment for actual inflation. **7.2** There will be no new transitional arrangements for existing facilities not already subject to transitional pricing arrangements.	**7a**	Do stakeholders agree that existing transitional pricing arrangements should consider actual outcomes in addition to forecasts?	Supported; noting that symmetrical 'true-up' mechanisms are a standard feature of economic regulation.
		7b	Do stakeholders agree that new transitional pricing arrangements are not necessary?	Not supported; noting that the absence of effective 'true-up' mechanisms will dampen investment signals.

1.5. Future consultation on Initiatives 3, 4 and 5

While there may be some administrative savings in having unilateral discretion to make rapid rule changes in the WEM, the unfortunate consequence is that signals for investment in large, long-lived energy infrastructure are being muted.

Therefore Bluewaters Power recommends that further development of the current reform pathway, along with associated investment in systems, processes, etc. be paused until an agreed target operating model can be articulated and costed. This will ideally include an economic analysis of the net benefits and costs associated with the current pathway for reform relative to the pragmatic alternatives outlined in this submission.