AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Level 12
171 Collins Street
Melbourne VIC 3000

Postal address
GPO Box 2008
Melbourne VIC 3001

T 1300 858 724
F 03 9609 8010
E info@aemo.com.au

18 July 2025

Rainer Korte
Chair, Reliability Panel
Reference: REL0094

Dear Mr Korte,

AEMO submission to issues paper – 2026 Reliability Standards and Settings Review (RSSR)

AEMO appreciates the opportunity to provide a submission at the commencement of the Reliability Panel's 2026 Reliability Standards and Settings Review ('the review').

The reliability standard is intended to establish an appropriate economic level of reliability in the NEM and should continue to reflect the evolving market and risk profile. The market price settings are intended to provide financial incentives for investment and operational decision-making at the level of the reliability standard.

While there are a range of existing and emerging mechanisms that impact reliability, AEMO remains of the view that the presence of out-of-market mechanisms demonstrate that the standard and settings may not be meeting expectations. The basis on which the Panel reviews them therefore needs to be clear to provide clarity on how fit-for-purpose financial incentives are provided for investment in the NEM.

Acknowledging that this submission is in response to the Issues Paper and without the benefit of modelled outcomes, AEMO has provided initial feedback in the attachment on key considerations and priorities for the Panel through this review, including:

- *The reliability standard should be set at the level reflecting consumer tolerance to emerging reliability risk* – there is a tension between the level of the average expected unserved energy (USE) reliability standard and consumer and jurisdictional expectations and experience of reliability events. This needs to be either addressed or acknowledged.

- *The reliability framework drives operational outcomes* – the level of the reliability standard should be considered for what it means operationally if the standard it is not met, including procurement powers or interventions that are limited by the level of the standard.

- *MPC/ CPT combination* – modelling the MPC/CPT combination should be set according to the distribution of forecast unserved energy events to try to avoid entering administered pricing.

- *Role of the market floor price (MFP)* – MFP should be considered in the context of providing signals for participants to respond or shift towards more flexible supply to clear the market.

Should you wish to discuss any aspect of our submission please contact Hannah Heath, Group Manager, Strategic Market Reform (Hannah.Heath@aemo.com.au).

Yours sincerely,

Matthew Myers

Matthew Myers
Acting Executive General Manager, Policy and Corporate Affairs (14-18 July 2025)

ATTACHMENT – Detailed submission

1. Reliability standard

The reliability standard and market price settings underpin reliable supply, and the value of participation within the electricity market.

1.1. Form of the reliability standard

The Panel completed a review of the form of the reliability standard and APC last year which found the current form of the standard as still fit-for-purpose with the increasing supply of variable renewable energy.[1] AEMO's preference to change the form of the standard to account for the changing nature of reliability risk remains. That is, expected USE outcomes are shifting towards high-impact, low-probability events at the 'tail' of the distribution of forecast USE events and as consumers do not experience average outcomes, the form of the reliability standard could better account for the nature of this risk.

While AEMO did not agree with 'no change' to the standard, we accept the Panel's findings and considers that while maintaining the current form of the standard, greater emphasis needs to be placed on communicating what a USE event means for the consumer experience of reliability outcomes. In doing so, stakeholders are better able to understand and decide whether expected USE outcomes are acceptable or align with their tolerance to potential reliability outcomes. AEMO suggests that a practical way to incorporate this may be for the review is to consider the distribution of USE events in terms of depth, duration and frequency when setting the *level* of the standard. For example, 0.002% average annual USE could equate to forecast USE exceeding 10% of winter demand (depth) for 3 hours (duration), occurring every four to five years (frequency).

Despite the above, AEMO recognises the difficulty in accounting for tail risk within the reliability standard in the current context due to:

- Decreasing NEM wide Value of Customer Reliability (VCR)
- Inflationary cost pressures on new supply resources
- Inability to model new technology breakthroughs and productivity improvements
- Existing planned increases to market price settings.

1.1.1. Decreasing NEM wide VCR

The reliability standard is set at the point where the cost of additional resources exceeds consumer value of the reduction in USE gained from the additional resources. The customer value of the reduction in USE is calculated by the VCR as set by the AER. The 2024 AER VCR Review found the NEM wide VCR to decrease by 39% from 2019 calculated values.[2] This was largely driven by significant decreases in business VCR values. In contrast, residential VCR values increased over the period. This is an inherent difficulty in calculating a single value to represent varied customers, further evidenced by the conflicting results in different segmented (regional, business type) VCRs.

The VCR calculated also does not differentiate between consumer risk as it assumes tolerance for all reliability events is the same, regardless of how long or widespread. AEMO supports the role the

[1] Reliability Panel, Review of the form of the reliability standard - https://www.aemc.gov.au/market-reviews-advice/review-form-reliability-standard-and-apc

[2] AER 2024 Value of Customer Reliability Review – Final Report - https://www.aer.gov.au/system/files/2024-12/2024-12-18%20AER%20-%20Final%20report%20-%202024%20VCR%20review_0.pdf

VCR has in supporting a determination of economic levels of reliability. However, it is important to note the limitations of the VCR, and that the VCR approximation is best not be taken in isolation to represent consumer views of the nature of reliability risk in the future.

In AEMO's experience that there is an increasing gap between the level of the reliability standard (as set by the VCR) and government expectations of reliability and often near zero tolerance to USE outcomes. Despite broad acknowledgement of the transitioning system and the associated risk, policy makers have typically very low tolerance to USE events. For example, the 0.0006% USE Interim Reliability Measure (IRM) was established by Ministers on advice from the Energy Security Board (ESB) that found that maintaining reliability to meet levels of a one-in-10-year summer better aligns with community expectations of reliability and would deliver net positive benefits.[3]

For clarity, by raising these points AEMO is not advocating for a reliability standard set at levels above the efficient level. Instead AEMO seeks to emphasise the difficulty in quantifying societal tolerance to reliability risk and the value customers place on insurance against high-impact, low-probability outcomes. Given this challenge, in addition to the VCR, AEMO encourages to Panel to consider more broadly ways to reflect on societal expectations of reliability risk. This could include direct consultation with jurisdictions and policy makers on their tolerance and value to consumers of USE events.

1.1.2. Existing increases to market price settings

Despite AEMO's preference to manage reliability to account for tail risk, AEMO acknowledges the difficulty of doing so with the market price settings. By the end of financial year 2028 the market price cap will have increased to $22,800/MWh while the CPT will have increased from 7.5 to 8.5 hours[4]. The stepwise increases from the 2022 RSSR were found in the Panel's 2022 modelling as the minimum level required to support investment in generation, storage and demand response needed to avoid exceeding the reliability standard.[5] The selection of minimum levels however does not provide any allowance for modelled input inaccuracy such as differences between forecast and real generator costs.

It is important to note that these increases were required to support investment consistent with achieving the current reliability standard, not to increase the level of reliability in the system or better match forecast reliability outcomes with consumer expectations. Theoretically in a functioning market with competition driving price outcomes, a market price cap should not be required. Consumers should be able to manage their willingness to pay within the demand side of the market. This is not the case with minimal price elasticity of electricity demand and consumers not directly exposed to the wholesale price. Given this construct, AEMO acknowledges the second role of the price settings in managing participant exposure to volatility and price risk in the NEM.

Even if there is support for an increased level of reliability in the NEM, AEMO is aware there may be little scope to increase the price settings given the existing planned increases to FY2028. AEMO acknowledges this challenge and considers that this is a broad challenge for the sector - i.e.,

[3] ESB, Interim Reliability Measures – Interim Reliability Reserve - https://web.archive.org.au/awa/20210603125216mp_/https:/energyministers.gov.au/sites/prod.energycouncil/files/ESB%20Decision%20Paper%20%E2%80%93%20Interim%20Reliability%20Measure.pdf
[4] In 2022 dollars
[5] Reliability Panel, 2022 RSSR Final Report, page 67 - https://www.aemc.gov.au/sites/default/files/2022-09/2022%20RSS%20Review%20Final%20Report%20%281%29.pdf

maintain reliability, including the changing nature of reliability risk through the energy transition, without exposing the market to unacceptably high costs or increasing the risk of widespread financial default.

AEMO supports the Panel's role in assessing this trade off through this review process and is pleased to see the Issues Paper explicitly considering a range of technologies required to maintain reliability whilst minimising costs.

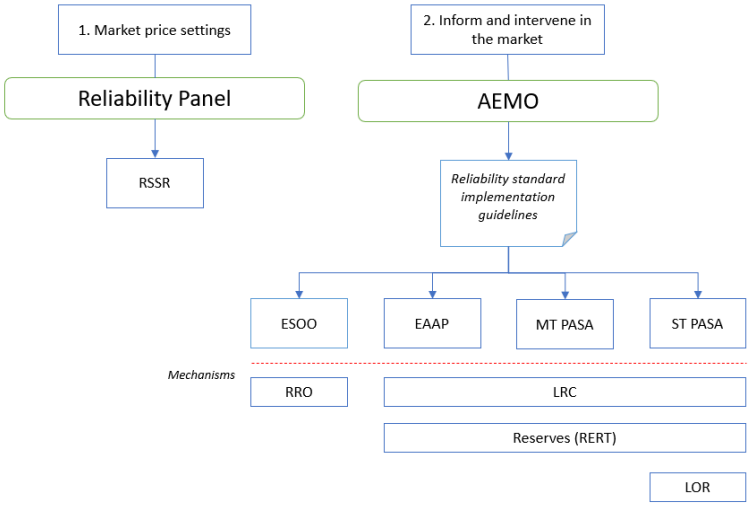
1.2. Clarity on reliability outcomes in the NEM

Section 6 of the Issues Paper describes the modelling approach that informs each RSSR. AEMO welcomes the opportunity to engage further with the Panel on the assumptions and decisions underpinning the modelled assessment of both the economic level and ability for market price to support the level of investment needed for that level of reliability.

AEMO recommends that in addition to the economic modelling, the Panel should have increased consideration of the practical implications on what the level of the reliability standard means or what it means operationally if that level of reliability is not met. AEMO considers this clarity, in addition to consideration of the tail or distribution of USE outcomes, will provide a more complete picture to help inform policy makers and consumers' views of the underlying reliability risk that is emerging within the transitioning system.

As part of the reliability framework, AEMO has a role in operationalising the reliability standard by informing and intervening in the market as shown at a high level below in Figure 1 below[6].

Figure 1 Operationalisation of the reliability standard



The level of the standard not only affects price settings but sets the point at which AEMO assesses supply adequacy against the reliability standard. The ESOO forecasts reliability and identifies gaps triggering the RRO and long-notice RERT procurement, as well as generally informing the market of future gaps or investment opportunities. The EAAP and MT PASA forecast likelihood and magnitude of USE outcomes based on pre-defined scenarios or participant expectation of generation

[6] Further detail is included in the Reliability Standard Implementation Guidelines - https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2023/reliability-forecasting-guidelines-and-methodology-consultation/final/reliability-standard-implementation-guidelines.pdf?la=en

availability. If average annual USE exceeds the 0.002% reliability standard, AEMO may choose to act via RERT procurement as per the NER and RERT framework. Over the short-term horizon, however, AEMO assesses reliability via ST PASA based on system adequacy of available capacity as there is no practical way to implement the reliability standard in the short-term (under 7 day) using deterministic operational processes.

As the trigger or threshold amount for assessing future supply adequacy and enacting any required market interventions, AEMO's priority is ensuring all stakeholders are aware and aligned on what the level of the reliability standard means and what in practice AEMO is able to do once this level is set. For example, since the expiry of the IRR as the trigger for Interim Reliability Reserve (IRR) in March 2025, AEMO is no longer able to enter contracts for reserves if forecast USE is above 0.0006%, instead reverting to the 0.002% trigger for long-notice RERT.

If societal expectations, including those of governments are that tail risk or reliability outcomes should be managed at levels tighter than the 0.002% reliability standard, these views should be captured as part of this review in setting the level of the reliability standard, as AEMO will not be able to respond at tighter levels once the standard is set. For example, a general expectation may be that society can come through a 'hot' summer with a 'normal' number of outages and not shed load. In reliability terms this could translate, for example, to enough capacity to meet demand to not shed load for '10% POE demand, N-1 generation and 50% POE VRE at the time of peak'. Ultimately the RSSR should be clear when making decisions on the level of the reliability standard is not only a driver of investment in the market, but the operational processes and what it means for consumers at that level of reliability.

2. Market Price settings

In current market design, the market price settings support investment for reliability outcomes to the level of the reliability standard. This section provides initial feedback and priorities for consideration of the market price settings.

2.1. Market Price Cap and Cumulative Price Threshold

AEMO continues to support the market price settings, most importantly the MPC and CPT, as the primary means to deliver reliability through the energy transition. The Issues Paper seeks to consider the role of the government and jurisdictional schemes on the market price signals including the question of any distortionary interactions between the two mechanisms to delivery reliability. Whilst important to acknowledge, AEMO does not consider the presence of out-of-market policy or underwriting schemes changes the role of the Panel in recommending an MPC commensurate with the need to provide financial incentives for investment in the NEM.

AEMO notes the NEM Wholesale Market Settings Review is considering the need for additional measures to support investment following conclusion of the CIS tenders in 2027 and agrees that the RSSR should have regard to any recommendations the NEM Review may make with respect to the reliability standard and settings for the time horizon this review is considering. Additional measures or underwriting mechanisms can provide opportunities to accelerate the energy transition while maintaining reliability and security. Despite the potential existence of such schemes, the market settings should remain fit-for-purpose for the energy transition. Any out-of-market or contracting mechanisms are likely to rely and be valued on structure and forecast prices within the wholesale

market. This means appropriate market price settings are required to support timely investment. If revenue adequacy is removed from the market, costs and risks profile of such mechanisms may increase.

2.2. MPC and CPT balance

AEMO supports the Panel's proposed modelling approach to consider the appropriate balance between the levels of MPC and CPT. Page 30 of the issues paper states:

> *.. given the increasing investment in new technologies, that the MPC should allow for investment in the lowest cost plant necessary to meet the reliability standard, and as such, will need to examine whether the current level of the MPC allows the wholesale market to send the price signals for all technology types.*

AEMO agrees that the MPC should be set to enable investment and operational outcomes for all technology types. This can be done by ensuring the CPT is not too limiting given the distribution of forecast USE events. Reliability is increasingly characterised by energy-limited plant, instead of traditional capacity limited plant. Energy storage will play its part in the technology mix as the power system transitions and should be explicitly considered in modelling as part of the candidate new entrant power system resources with variations in technical characteristics, durations etc.

Modelling approach

As defined in Section 6 of the Issues Paper, the role of the modelling of market price settings is to assess the level of revenue adequacy required for marginal new entrant generation using cost assumptions for the outlook period at the point in time of the modelling. The 'grid-search' optimisation model is run to minimise total system cost whilst incentivising new entrant generation. The optimisation approach means there will be various combinations of settings depending on the choice of marginal new entrant and preference for a relative higher MPC or CPT.[7]

AEMO is supportive of this modelling approach and acknowledges that while storage and specific technologies are defined as part of the marginal new entrant mix, we do not ultimately know what the long-term efficient supply mix will be. It is the role of the market to deliver the services or supply that is required based on the reliability events that may occur. The MPC and CPT combination should not exclude any one technology type, instead ensure adequate incentives for the resources and services required as defined by distribution of reliability events.

Having said that, the modelling results including the economic MPC and CPT combination unavoidably hinge heavily on input assumptions and modelled techniques. AEMO supports further consideration of how modelling incorporates assumptions on innovations, behaviours and commercial models of future plant. For example:

- OCGT has been historically thought of as energy unlimited generation and typically found to be most economic marginal new entrant technology. In practice, AEMO is seeing that future limitations on gas including availability during peak periods means OCGT should be increasingly thought of as energy limited in its ability to support reliability during scarcity.

[7] Issues Paper, page 46

- Modelled new generation assumes economic entry based on reliability resource value. In practice, AEMO considers there may be opportunity for firm capacity that enters the market with support of a security contract to also provide reliability during periods of energy scarcity.
- Grid-connected consumer resources, for example batteries that are used in vehicles, but may be able to supply the electricity grid, or moderate consumption patterns, and how to treat the costs of such assets in any assessment.

AEMO welcomes the opportunity to further engage on the modelling approach, assumptions and results. Section 6 of the directions paper notes the change of modelling approach from the previous RSSR is informed by techniques developed in the form of the standard modelling and an increase focus on weather variation. Analysis of weather driven reliability risk is central to characterising USE outcomes and the supply side resources that are required to manage this risk.

2.3. CPT

The Review of the Reliability Standard and Settings Review Guidelines consider the purpose of the CPT as:

- Cap, the total price risk to which market participants are exposed, over a given time periods, and
- Maintain the effectiveness of the MPC, by not hindering the market price signals for efficient operational decisions and efficient investment in generation capacity and/or demand-side response.

Despite the later purpose as defined above, the use of the CPT is inherently a distortion on the market with the capability to be particularly restricting on energy limited plant.

AEMO agrees that this review should consider if a higher CPT better aligns with a need to avoid disincentivising longer duration resources that manage evolving reliability risk. This will be important in the context of forecast USE outcomes that, when they do occur, have the potential to be longer and deeper. A higher CPT may encourage greater contracting and better avoid the market entering administered pricing during sustained periods of scarcity.

Given the modelling is optimised to maintain the MPC/ CPT balance at the level of the reliability standard, any shift to a longer-CPT may warrant changes to the corresponding MPC. AEMO is wary of this approach noting that sustained periods of high prices are rare, and a longer CPT is unlikely to materially increase price risk and exposure to the market, but a consequential decrease of the MPC may decrease investor confidence in the market. Ultimately, AEMO supports consideration of the MPC and CPT combination in the context of the USE distribution and nature of reliability risk. This may include consideration of changes to the formulation of the CPT such as removing mid-low prices from the calculation. AEMO supports and looks forward to investigation of these options by the Panel.

2.4. Market Floor Price

The MFP is currently designed at a level to allow the market to clear at all times, while preventing market instability by imposing a negative limit on the total potential volatility of market prices. The 2022 RSSR confirmed the ‘philosophy’ of the MFP as an operational signal to manage generator

commitment under excess generation conditions rather than as an investment signal for reliability purposes.[8] There are however potentially conflicting issues to be considered regarding MFP.

The market has seen the increasing emergence on Minimum System Load (MSL) conditions where DPV generation is high such that operational demand is lower than the generation required to maintain a secure operating state. The Issues Paper identifies the increasing frequency of MSL events as a need to consider the extent to which the MFP has a role to play in mitigating MSL events over both operational and investment timeframes.

On the one hand, the review could explore the role a lower MFP may have as a signal for participants to shift towards flexible supply, changes in operating patterns for thermal plant, or invest in technologies that may assist in clearing the market. Operationally, a lower MFP may be an opportunity to increase voluntary incentives to reduce DPV exports to the grid during negative price periods. However, it is important to note that most uncontrolled DPV is not directly exposed to the wholesale price. That said, a more negative MFP could have a role in encouraging innovation in retail and network tariffs and CER controls, that may better support system operations during MSL periods. Ideally this may promote changes in DPV export decisions as well as bolster incentives for storage, including community and distribution batteries as participants may be encouraged to capitalise on the opportunity of increased load during MSL periods. AEMO supports further consideration of the potential for the MFP in this role including consideration of the potential risks and consequential impacts of doing so.

On the other hand, AEMO also notes that when considering changes to the role and level of the MFP there may be consequential impacts on participant bidding. The NEM is a regionally settled, nodally dispatched market. When transmission constraints occur, generators may submit very low bids—below marginal cost—to secure dispatch and receive higher regional prices, a behaviour called disorderly bidding. This leads to floor price bidding and cause local generators to be prioritised over interconnectors also affected by constraints, especially if the MFP is low. Negative offers from partially constrained generators can influence the regional price calculation, potentially increasing it. AEMO encourages the Panel's analysis of the MFP to include consideration of this dynamic and welcomes further engagement on this with the Panel.

[8] 2022, RSSR, Final report, page 104 - https://www.aemc.gov.au/sites/default/files/2022-09/2022%20RSS%20Review%20Final%20Report%20%281%29.pdf