

Reliability Panel
Australian Energy Market Commission
PO Box A2449
SYDNEY SOUTH NSW 1235

Lodged online: www.aemc.gov.au

3 March 2022

RP0083 – 2022 Reliability Standards and Settings Review Issues Paper

The Australian Energy Council welcomes the opportunity to make a submission to the Reliability Panel's *2022 Reliability Standard and Settings Review* Issues Paper (the Issues Paper).

The Australian Energy Council (AEC) is the industry body representing 20 electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. These businesses collectively generate the overwhelming majority of electricity in Australia, sell gas and electricity to over 10 million homes and businesses, and are major investors in renewable energy generation.

QUESTION 1: CHANGES IN THE GENERATION MIX

- *How do stakeholders consider changes in the generation mix interact with the assessment of the reliability standard and settings, in particular for the period of 2024-2028? What are the implications of the changing generation mix for the reliability standard and settings?*
- *What other factors should the Panel account for when considering economically driven retirement decisions?*

Clearly the NEM generation mix is undergoing profound change but in general the modelling appears to approach the issue correctly. With respect to the dominant entry of wind and large and small scale solar, much of the modelling's accuracy of estimating reliability risk will rest on the representative wind/sun traces that are applied to the modelling. It is important that extended periods of very widespread renewable energy drought as has been observed in previous winters are captured in the modelling.

With respect to the new generation mix, storage will become key as a new entrant source of firm dispatchable capacity. The modelling should evolve from meeting the last increment of load with a peaking gas turbine as it has done previously across to storage.

Obtaining reasonable new-entrant cost estimates of storage energy will be highly critical. The vanilla new entrant seems likely to be a large-scale lithium ion battery. Cost projections of large-scale battery per MW and MWh can be readily obtained and modelled.

It seems the most critical aspect to be modelled will be the returns required for the energy capacity (i.e. MWh) of a vanilla battery as needed to keep Unserved Energy (USE) beneath the standard in the presence of renewable energy droughts.

QUESTION 3: CHANGES IN WHOLESALE MARKET OPERATION AND PRICING DYNAMICS

- *How do recent and expected future electricity pricing dynamics, and the introduction of 5 minute settlement interact with the reliability settings and the Panel's assessment for this review? What are the implications of these trends for the reliability standard and settings?*

One aspect that has played a large role in previous Panel assessments has been the inclusion of portfolio-wide optimisation behaviour in the modelling. When the modelling anticipates significant economic withholding of capacity (i.e. by bidding generation plant at the MPC), then the modelling tends to suggest that the last increment of new-entrant capacity necessary to keep within the reliability standard can be profitable with surprisingly low MPCs.

This is a dangerous assumption as it relies on the existence and exercise of significant market power. The state of flux of the industry's ownership structure makes predicting future energy portfolios highly uncertain. Furthermore, generation's historical characteristics of scale-efficiencies and long-build times have broken down and this in turn provides an environment conducive to a highly competitive market. The AEC investigated this matter in a detailed report which it recommends the Panel considering at this time¹.

In summary the AEC considers the modelling should take a conservative view with respect to portfolio optimisation, by apply bidding structures consistent with atomistic ownership.

QUESTION 4: ESB POST-2025 MARKET DESIGN REFORMS

• How may the Post-2025 market design reforms impact on the reliability standard and settings? What are the implications for the reliability standard and settings?

The AEC understands that the Panel is approaching the Review on the basis of the current market design, i.e. it is assuming a capacity mechanism will NOT be introduced by the Energy Security Board (ESB). The AEC strongly supports this approach as:

- Given the controversy surrounding introduction of a capacity mechanisms, and some of the constraints placed on its work by the National Cabinet, there is no certainty that a reform will be implemented.
- ESB's previous work, and the National Cabinet's design principles, suggest such a mechanism should only be seen as complimentary to the energy-only market's investment processes. The AEC considers this means the Panel needs to develop settings on the presumption of an energy-only market, leaving the capacity mechanism to operate as a form of additional support.
- The power system is changing from a peak-demand constrained system to an energy-limited system (from the combination of renewable energy droughts and energy-limited storage). There are doubts that the deterministic capacity mechanism that the ESB is developing will be capable of providing the investment and operating incentives necessary for an energy limited power system. In this case lowering the value of the energy-only signals in lieu of a capacity mechanism could endanger the market's ability to clear in renewable energy droughts.

QUESTION 7: THE LEVEL OF THE RELIABILITY STANDARD AND CONSIDERATIONS ON VCR

• Do you consider that there is evidence that a different level of the reliability standard would deliver better overall outcomes for the NEM?

• What factors do stakeholders suggest should be considered alongside the AER's VCR in determining the level of the reliability standard?

The AEC continues to support the official USE target of 0.002% which it considers to be the only target that is economically defensible against the Value of Customer Reliability (VCR). The AEC does not consider that the ESB's imposition of the interim reliability measure in early 2020 had economic merit, nor was it developed with the sophistication and experience of the Panel's approach.

¹¹ <https://www.energycouncil.com.au/media/14945/20181213-final-report-advice-on-nem-structure-in-light-of-technology-change-stc.pdf>

The AEC recognizes a widespread belief in the industry that governments consider the official standard unacceptable. Whilst accepting governments are highly concerned about reliability and frequently intervene, it is not clear to the AEC governments intervene because they object specifically to the standard's level or even that they fully understand it.

The AEC prefers that the Panel focus on the economics as anticipated in the National Electricity Objective and not attempt to second guess the desires of governments to pursue levels of reliability that are not in the long-term interests of customers. The Panel should leave to the ESB's capacity mechanism work any question of achieving levels of reliability beyond the standard.

The AEC considers the AER's process to be the world's most robust quantitative determination of VCR. It is also updated appropriately. It seems that any changes to VCR associated with the pandemic would be second-order and temporary. The AEC therefore cautions against adjusting the official level based on some anecdotal view.

QUESTION 8: FORM OF THE RELIABILITY STANDARD

- *Do stakeholders consider there are shortcomings with USE that justify its replacement with an alternate standard form?*
- *What are the benefits of using an alternative standard form over the existing form? If so, what alternative forms are considered appropriate and why?*
- *Do stakeholders consider that supplementary or additional metrics, in addition to USE, should be considered to help provide further insight to reliability events?*

In each settings review since market start the USE form of the standard has been challenged against approaches used overseas. All these reviews have determined that the USE measured over the average of simulations is superior to all other metrics both in terms of its scientific basis and operability.

Average USE is an output measure which can readily identify the cost of interruption upon consumers through the use of a VCR multiplier. Such a straightforward economic valuation cannot be done for Loss of Load Expectation nor Loss of Load Probability. Deterministic approaches are highly inaccurate and are unworkable in a power system characterized by stochastic generation and energy limitations.

The AEC disagrees with the contention in Box 2 that a USE standard does not provide enough information to deal with energy storage. By the contrary, the modelling can reproduce periods of storage exhaustion during renewable energy droughts that lead directly to simulated USE events. In fact, it is all other forms of standard that struggle with storage energies.

The AEC also rejects suggestions such as exceeding the reliability standard no more often than once in ten years. Such proposals simply seek to adopt a more conservative standard than the economics recommends by hiding the conservatism in a more opaque and confusing form. If the modelling suggests that a more conservative standard is economically justified, a lower USE can be explicitly adopted without changing the standard's form.

QUESTION 10: FURTHER ISSUES REGARDING THE MPC

- *Do you consider that the emergence of new technologies warrants a change in the MPC in order to enable technology-neutral investment to meet the reliability standard in the most cost-effective way?*
- *Do you consider that the implementation of five minute settlement in October 2021 will affect the efficacy of the MPC in managing the risk exposure of market participants, while still providing efficient price signals?*
- *Do you consider that the introduction of new markets would mean a change to the MPC is required?*

- *What is the effectiveness of the MPC in allowing for investment in a technology-neutral, least-cost manner in the current environment of the NEM in transition?*
- *What factors or issues regarding spot prices, investment, market participants and/or the predictability and flexibility of the regulatory framework should the Panel pay particular attention to?*
- *Do you consider that the introduction and continuation of government investment schemes means that changes to the MPC should be considered?*
- *Do stakeholders consider implementation of five minute settlement, and other recent changes, leading to materially different outcomes than those seen in historical data?*

Whilst the AEC looks forward to the outcomes of the modelling, its prior assumption is that the overall trends in the power system would imply an increase in the real MPC in order to retain USE within the standard. If this is the recommendation, the AEC considers that well-telegraphed progressive increases would be manageable by the industry.

Importantly, the AEC believes there is no case for reducing the real MPC.

QUESTION 11: ISSUES RELATING TO THE SETTING OF THE MFP

- *Do you consider that the form and level of the MFP remains appropriate in the context of greater entry of storage and greater demand side participation in the NEM?*
- *In your view, should the Panel consider a negative cumulative price threshold? If so, what factors should be considered when determining the level of a negative CPT?*
- *In your view, is there benefit in the Panel considering setting technology specific market floor prices?*
- *Do you consider that the level of the MFP should be adjusted to account for the real reduction in its level over time? What form of indexation would be appropriate?*
- *Would the creation of new system services markets change your view on the appropriate form of the MFP?*
- *Would the creation of new system services markets change your view on the appropriate level of the MFP?*
- *Do stakeholders consider implementation of five minute settlement, and other recent changes, leading to materially different outcomes than those seen in historical data?*

The Market Floor Price (MFP) has bound only very rarely since the introduction of five-minute settlement on 1 October 2021. Since then there has been no evidence of the NEM having difficulty in resolving periodic surpluses as a result of the MFP. This in turn means there are few extremely negative prices and so the risks implied by negative prices are also not extreme.

Hence the AEC considers that other aspects of the settings are more deserving of the Panel's focus. As the MFP appears to be well outside the range of negative clearing prices required to resolve surpluses, there seems to be no advantage of introducing the complexity of indexation.

In the same vein, it is not clear there is any benefit in introducing a negative Cumulative Price Threshold (CPT).

QUESTION 12: ISSUES REGARDING THE CPT

- *Do you consider that the form and level of the CPT remain appropriate to encourage investment signals in a technology-neutral manner regarding the emergence of new technologies?*
- *Do you consider that the current time period that the CPT is assessed against (seven days) remains appropriate to allow participants to manage their price risk, while maintaining investment signals?*
- *Do you consider that the form and level is appropriate to manage sustained high prices in both energy and FCAS markets?*

The AEC considers the CPT likely to be the most significant market setting with respect to the reliability of the future energy-limited power system. In its present form it triggers after a rolling week accumulating to the equivalent of 7.5 hours of MPC. As other prices in the week are likely to average higher than zero, this effectively removes the investment case to build storage with greater than about 5-6 hours of energy depth. This seems insufficient to manage renewable energy droughts.

Furthermore, a low CPT distorts operational incentives to operate energy stocks conservatively. Participants have a perverse incentive to release all their stored energy before the CPT triggers, inefficiently displacing non-energy limited sources even when the most critical power system condition is forecast to occur after the trigger.

Nevertheless, the AEC supports the concept of the CPT as a last-resort financial risk management mechanism that can avert a potential systemic financial collapse, especially in the aftermath of major transmission disruptions. The Texas February 2020 event showed the financial risks that can emerge without such a safety valve.

The modelling should be able to demonstrate the effect of the CPT on the revenue of storage during renewable energy droughts. In the AEC's view, it seems very likely that a CPT more than 90 times² MPC will be required.

The AEC encourages the Panel to critically consider the form of the CPT and whether its form best achieves two objectives of:

- Not interfering with the investment signals to build dispatchable capacity to keep the power system within the standard in a future energy-limited system; and
- Limiting financial risks in the aftermath of a *force-majeure* network event to a level that is unlikely to cause a systemic financial contagion.

Alternatives that might be considered could include:

- a much higher CPT, measured over a longer period, followed by a longer application of the Administered Price Cap (APC),
- progressive applications of multiple, declining APCs,
- a higher CPT in combination with a physical *force majeure* arrangement as unsuccessfully proposed by the National Generators Forum³.

QUESTION 13: ISSUES REGARDING THE APC

- *How should the Panel consider setting the APC for technologies such as hydro and utility scale batteries?*
- *Have typical generator SRMC increased significantly since the previous review period? Or are they expected to do so over the period 2024-2028?*
- *Do you consider that the APC remains appropriate to compensate generators during APPs?*
- *Is there evidence that the APC is affecting the contract prices and so affecting incentives for new investment?*
- *Is there a case for the APC to be indexed going forward?*
- *Given recent market developments and pricing outcomes, is the current form and or level of the APC appropriate? If not, what would be an appropriate form of the administered price cap, why and what is the evidence supporting your view? If not, what would be an appropriate level of the administered price cap, why and what is the evidence supporting your view?*
- *Do you consider that the current APC provides sufficient investment signal for new technologies?*

² 90 being 7.5 hours * 12 five minute periods

³ <https://www.aemc.gov.au/rule-changes/contingency-administered-price-cap-following-a-phy>

The APC was originally set at \$300/MWh in alignment with the fuel cost of liquid fuel gas turbines at the time of NEM start. Failing to index it means it now has about half the value for which it was intended. Simply on this basis there is a clear need for a substantial increase.

Furthermore, the introduction of new technologies, and a greater reliance on the demand-side for power system balancing, means that its present level is seriously distortionary to periods when a degree of market profit and risk is necessary simply to operate the power system safely.

The distortion of the APC on balancing the market is moderated thanks to the compensation being available to cover short-run marginal costs, but:

- compensation is only available for scheduled generators, and the demand-side has no incentive to assist; and
- there are great challenges in compensating for the fair value of stored energy.

In addition to this consideration should be given to moving the APC floor price closer to zero. The forms of network disruption likely to trigger CPT typically result in challenges balancing the system with resulting wild swings in (uncapped) prices – both positive and negative. Currently, the floor and cap of the APC is symmetric whereas the relativities of the MPC and MFP are 15.1 to 1.

QUESTION 16: PRINCIPLES GUIDING THE PANEL'S MODELLING

- *Do stakeholders have any feedback on the principles and high level approach proposed?*
- *Are there additional high level principles and considerations that the Panel should consider in its modelling to inform the RSS review?*

QUESTION 17: SPECIFIC ISSUES AND CONSIDERATIONS RELEVANT TO MODELLING FOR THE 2022 RSS REVIEW

- *Are there any stakeholder views on the importance of price-dispatch modelling at 5 minute resolution and welcomes suggestions on hybrid approaches?*
- *The Panel is therefore interested in stakeholder views on sensible simplifying assumptions that can be applied that will allow revenues to be appropriately approximated without requiring full co-optimised modelling?*
- *The Panel is interested in stakeholder views on the range of risks that should be captured in the scenarios modelled for the review?*
- *The Panel welcomes stakeholder views on the approach to modelling the impact of demand response on efficient reliability standard and settings is welcomed.*
- *Are there any stakeholder suggestions on approaches to modelling energy limited storage resources as reliability providers?*

As noted against questions 1 & 3, the AEC generally considers the models used by the Panel in previous assessments can be adequately adapted to current conditions. The AEC's main suggestions are:

- Not relying on portfolio optimisation bidding to materially increase revenue for the marginal investment unit;
- Ensuring renewable energy traces incorporate extended and widespread renewable energy droughts as has been experienced in winter; and
- The marginal investment unit should transition from a vanilla gas turbine to a vanilla storage.

Any questions about this submission should be addressed to me directly, by email to ben.skinner@energycouncil.com.au or by telephone on 03 9206 3116.

Yours sincerely,



Ben Skinner
GM Policy and Research