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Reliability Panel
c/- Australian Energy Market Commission
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Review of the Form of the Reliability Standard and Administered Price Cap — Issues paper — 30 March 2023

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EnergyAustralia is one of Australia's largest energy companies with around 2.4 million electricity and gas accounts across eastern Australia. We also own, operate and contract a diversified energy generation portfolio across Australia, including coal, gas, battery storage, demand response, wind and solar assets, with control of over 5,000MW of generation capacity.

We support the Panel's ongoing work in exploring the changing nature of reliability risks in the national electricity market (NEM).

The Panel's review of the form of the standard comes at a time when the NEM's reliability settings are in a critical state of flux, with an emerging patchwork of jurisdictional investment schemes alongside several legacy mechanisms like the retailer reliability obligation and interim reliability measure, which are also being reviewed. AEMO has also recently refreshed its reliability forecasting approach with a revised set of energy adequacy scenarios¹, and we expect further sophistication around the modelling of energy limits to flow into the Electricity Statement of Opportunities (ESOO) and Integrated System Plan (ISP). As these changes take place, the Panel can and should continue to play a critical role in providing independent and credible oversight of the NEM's reliability settings, with a view towards retaining national consistency and a primary focus on consumer preferences, as embodied in the AER's value of customer reliability.

We support the Panel's modelling of risk in a transitioning energy system

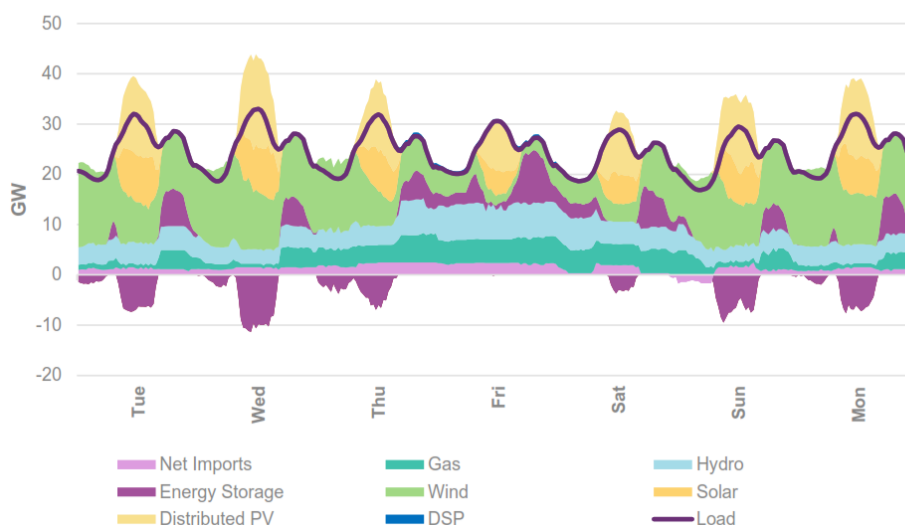
The Panel has already provided a compelling evaluation of reliability risk assessment under traditional capacity-limited energy systems relative to those that will be more challenged by weather-driven energy limitations as part of the transition.

We are supportive of the Panel framing these issues against a potential review of the form of the standard however see more value in the development of robust data and methods for reliability assessment. At present the public debate around reliability tends to reflect rules of thumb (for example, there is no clear definition of a 'renewables drought') and new investment tends to be measured in terms of how many homes can

¹ <https://aemo.com.au/consultations/current-and-closed-consultations/2022-reliability-forecasting-guidelines-and-methodology>

be powered² with little reference to changes in risk as large increments of thermal capacity are replaced with smaller increments of diverse clean technologies. AEMO’s ESOO and ISP projections provide a semblance of objective risk measurement however suffer from inherent limitations in method and in datasets. AEMO’s operational testing of ISP projections relies on fewer monte carlo simulations than employed in the ESOO, and is mostly presented in terms of case studies of selected times of system stress. Figure 11 from the 2022 ISP is a typical example of this in terms of a “low VRE” period in June 2040.

Figure 11 Forecast winter operability across southern regions, experiencing a three-day low VRE period, June 2040, Step Change



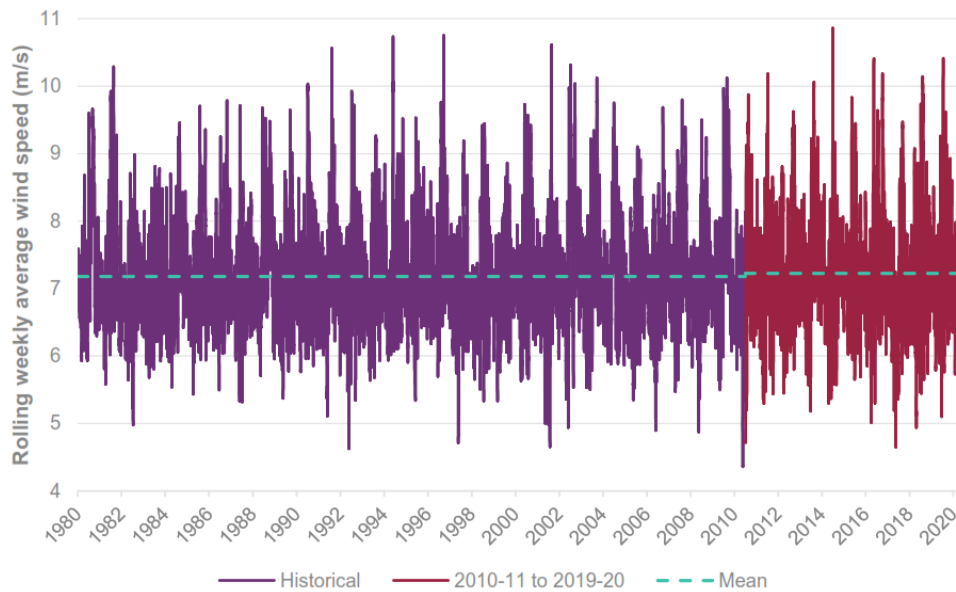
Source: AEMO, 2022 Integrated System Plan – Appendix 4 System Operability.

Figure 10 below, also from the 2022 ISP, reflects AEMO’s validation of wind speeds from its eleven weather reference years with a longer historical time series. This comparison led AEMO to conclude that more recent reference years should provide reasonable coverage for assessing a broad range of potential extreme weather conditions in the future NEM, and the operational impacts of these weather conditions.³ We consider a much more in-depth and systematic analysis is necessary to provide comfort that AEMO’s relatively limited set of weather reference years appropriately capture longer term variability and associated risk.

² <https://aemoservices.com.au/-/media/services/files/media-releases/010523-asl-mr-aemo-services-nation-leading-tender-and-contract-design-delivers-for-nsw.pdf?la=en>

³ AEMO, 2022 Integrated System Plan – Appendix 4 System Operability, p. 15.

Figure 10 Historical NEM-wide rolling weekly average wind speeds, 1980-2020



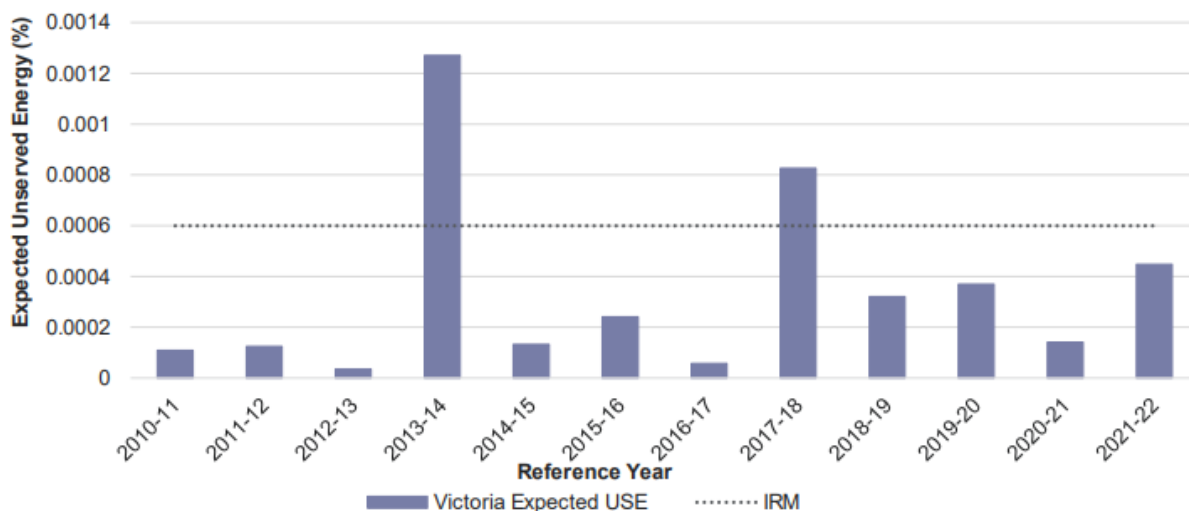
Source: AEMO, 2022 Integrated System Plan – Appendix 4 System Operability.

AEMO’s August 2022 ESOO directly highlighted the effect of its weather reference years on projected USE outcomes (see figure 21 below). While it would be highly onerous exercise, a thorough validation of reference year variations would be via a longer ‘out of sample’ comparison of USE outcomes, at a regional level on at least an hourly basis, rather than NEM-wide weekly wind speeds as per figure 10 above. AEMO’s December 2022 Forecasting Accuracy report has since highlighted the expansion of its weather reference years as a forecasting priority⁴, and it notes that that doing this will make it more likely that its simulations will account for limited wind and solar resource output, thus potentially increasing the risk of USE.

The Panel’s review should also identify how improvements in the measurement and forecasting of reliability risk may tend to increase the prospect of interventions being triggered i.e. even if there is no change to the form of the reliability standard.

⁴ https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/accuracy-report/forecast-accuracy-report-2022.pdf?ja=en

Figure 21 Impact of different weather reference years on expected USE in Victoria 2022-23, ESOO Central scenario (%)



Source: AEMO, 2022 Electricity Statement of Opportunities.

The expansion of reference year data and its use will be critical

At present the use of a limited set of weather reference years is a critical uncertainty that casts doubt over the robustness of AEMO’s reliability and planning exercises. Expanding this with synthetic data would be an advantage. That said, as noted by the Panel this would likely involve complex methods and use of judgement hence should be done with full transparency. The Panel’s input from the Mathematics Industry Study Group should also be subject to scrutiny and we suggest hosting an open forum with suitable experts once their academic paper has been received.

The Panel’s objective should be to develop and publish a suitably accessible library of simulated results that can be integrated into and hence improve ESOO and ISP assessments. We encourage the Panel to replicate AEMO’s recent reliability and ISP forecasting to illustrate its own points around the changing nature of tail risk. We understand that such modelling and associated changes in capacity installed and system costs would form the basis of the Panel’s economic assessment and trade-offs in terms of customer impacts and risk preferences.

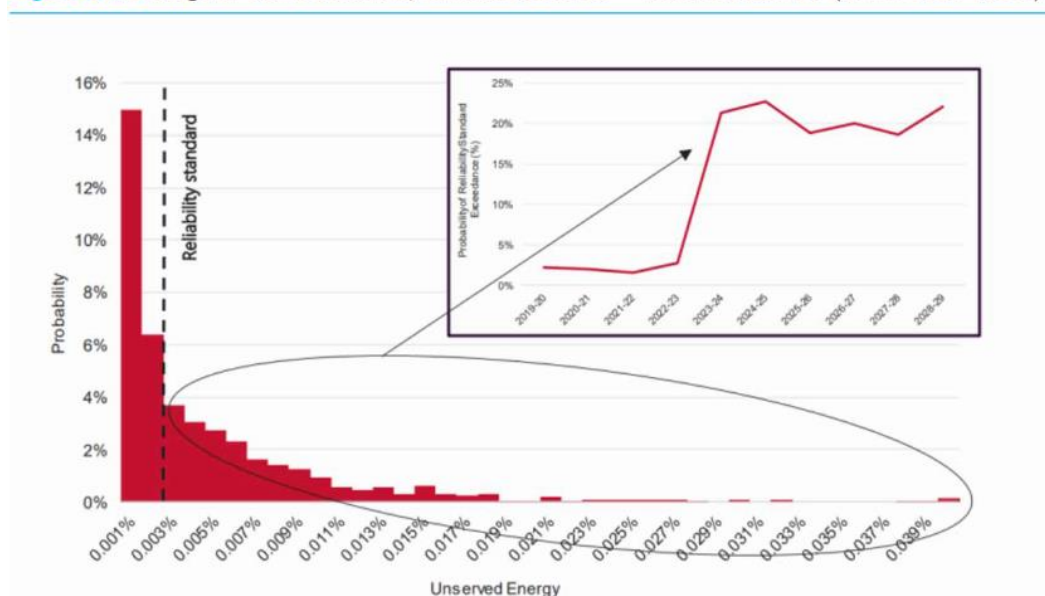
It may not be necessary or practical to change the form of the standard however auxiliary metrics published alongside expected unserved energy could give stakeholders important information on the level of risk inherent in the system. Metrics would inform questions of “how close” the system is to any sort of failure or “how exposed” is it to particular failure modes with differing likelihoods. The introduction of any new measures, even solely for information purposes, should be back-cast to understand how much risk customers have tolerated or experienced over time, in order to appropriately root expectations in the prevailing VCR and willingness to pay over those periods and into the future.

The Panel should be able to integrate this work with the AER’s survey datasets for the value of customer reliability, and vice versa the insights from the Panel’s analysis should

inform future AER surveys to the extent there are any gaps or deficiencies in how customers think about changing reliability risk.

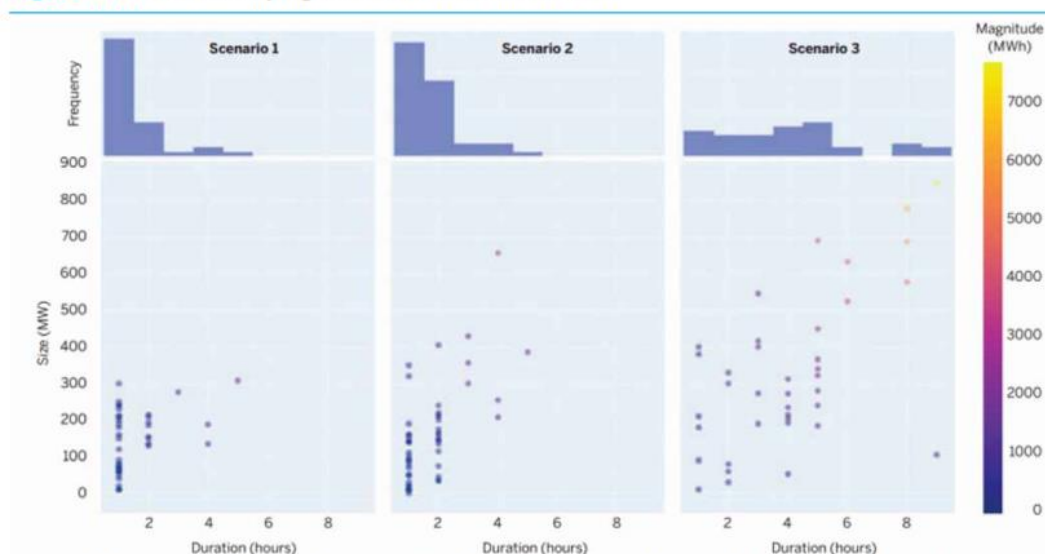
We do have some concerns that some stylistic representations of risk, created for the purposes of exploring different reliability measures, suggest overall higher risk exposure due to the transition or renewables droughts. For example figure 3.1 does not show the change in shape of the overall probability distribution and implies a step change in total risk from 2023-24. Figure 4.1 also implies high VRE systems are more prone to higher magnitude supply interruptions without appropriate context on probability or likelihood. We appreciate this is not the Panel’s intent and use of such graphics reflect limited data analysis in the NEM to date. We reiterate that the Panel’s primary value add here will be in generating its own robust set of observations, from which stakeholders will be able to interrogate and develop their own appreciation of risk in the NEM. How this relates to reliability risk measures is important but perhaps a second order issue to raising awareness amongst stakeholders and policy-makers.

Figure 3.1: Range of USE Outcomes, Central Scenario – Victoria 2019-20 (AEMO 2019 ES00)



Source: AEMO, 2019 Electricity Statement of Opportunities, August 2019, p. 13
 Note: Samples with zero USE have been omitted from the chart.

Figure 4.1: USE at Varying Levels of VRE Penetration



Source: Redefining Resource Adequacy Task Force. 2021. Redefining Resource Adequacy for Modern Power Systems. Reston, VA: Energy Systems Integration Group, Fig. 8.

It is not clear that the APC needs to change

We appreciate the Panel is now seeking feedback on options that were raised by stakeholders in the midst of Winter 2022 events. Its issues paper does not discuss any analytical framework or decision-making criteria which will be critical in assessing whether any change will be desirable.

Overall we recommend the Panel reconsider the need for reviewing the form of the APC. The recent increase in APC to \$600/MWh is likely to have addressed the issues which prompted calls last year for a dynamically set value or alternative forms. Notably the \$600/MWh was determined in light of potential costs arising from different gas generation heat rates and fuel costs, which is one approach mentioned in the Panel's issues paper.

Any 'dynamic' APC will be disruptive to contract markets. Choosing a particular fuel price series would be difficult to pre-empt at present. Assuming gas generation is the relevant price-setting technology over the coming period, gas markets may or may not evolve towards LNG export and netback ahead of predominantly domestic supply sources.

The Panel may wish to review and make recommendations on the following administrative aspects given the ties between electricity and gas pricing:

- the extent to which the level of the gas APC (and gas parameters generally) have an impact on electricity price outcomes
- amending the requirement in National Gas Rule 492(1)(g) that parameters in the Short Term Trading Market be reviewed after electricity price settings have been reviewed, rather than before (and with no equivalent provisions for the Declared Wholesale Gas Market)

- The general divergence in governance arrangements and processes between gas and electricity parameter setting i.e. AEMO is wholly responsible for setting gas market parameters, and has now been provided broader monitoring and intervention powers relating to reliability and security of gas supply.

If you would like to discuss this submission, please contact me on 03 9060 0612 or Lawrence.irlam@energyaustralia.com.au.

Regards

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