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19 January 2024

Reliability Panel Review of the Reliability Standard and Administered Price Cap: Directions paper

The Australian Energy Council (AEC) welcomes the opportunity to make a submission in response to the Reliability Panel (the Panel) Review of the Reliability Standard and Administered Price Cap (APC): Directions paper.

The AEC is the peak industry body for electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. AEC members generate and sell energy to over 10 million homes and businesses and are major investors in renewable energy generation. The AEC supports reaching net-zero by 2050 as well as a 55 per cent emissions reduction target by 2035 and is committed to delivering the energy transition for the benefit of consumers.

As the composition of the generation fleet continues to transition to less large capacity thermal generation and becomes more dependent on Variable Renewable Energy (VRE) and flexible firming capacity, (ie, storage, hydro and gas-powered generation), generally of smaller unit capacity increments, the nature of USE events is likely to change. This however may not result in more frequent or greater impact USE events than those currently forecast in AEMO's reliability assessments which we note rarely, if ever, actually occur in real time market outcomes. Therefore, it is important that transparent and extensive analysis is undertaken to better understand how USE events may likely occur as the market transitions. The AEC considers the modelling presented in the Directions Paper is a good first step in this process and looks forward to continuing to engage with the Panel as the modelling and analysis progresses.

As we have stated previously the AEC considers this is a *modelling* challenge rather than a necessary condition to change the form of reliability standard which relates to the economic impact on customers of accumulated rotational load-shedding. At this stage the results presented in the Directions paper provide no justification for a change to the form of the reliability standard. Nevertheless, we are guided by the National Electricity Objective (NEO) and retain an open mind.

Figure 1 displays actual USE events since 2005/06 to 2021/22 and while not shown from years 2000/01 to 2004-05 there was only one year of USE which was 0.00005% in NSW.[1] Clearly the reliability framework has been serving the NEM and its customers well and even though the NEM is transitioning away from large capacity coal fired generating units any decision to change the current Standard has a high bar to reach and must be supported by robust and unequivocal analysis and evidence. We consider it would be a poor and costly outcome for the consumers in the event the form of the Standard was changed based on weak supporting analysis.

[1] https://www.aemc.gov.au/sites/default/files/content/95031eac-1c95-44f1-9e91-9ce0bf3aefa7/Final-Report.pdf.

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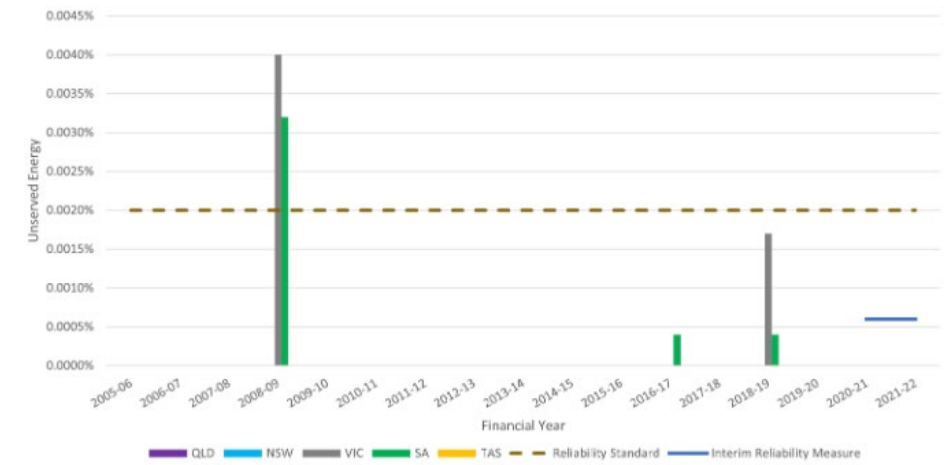
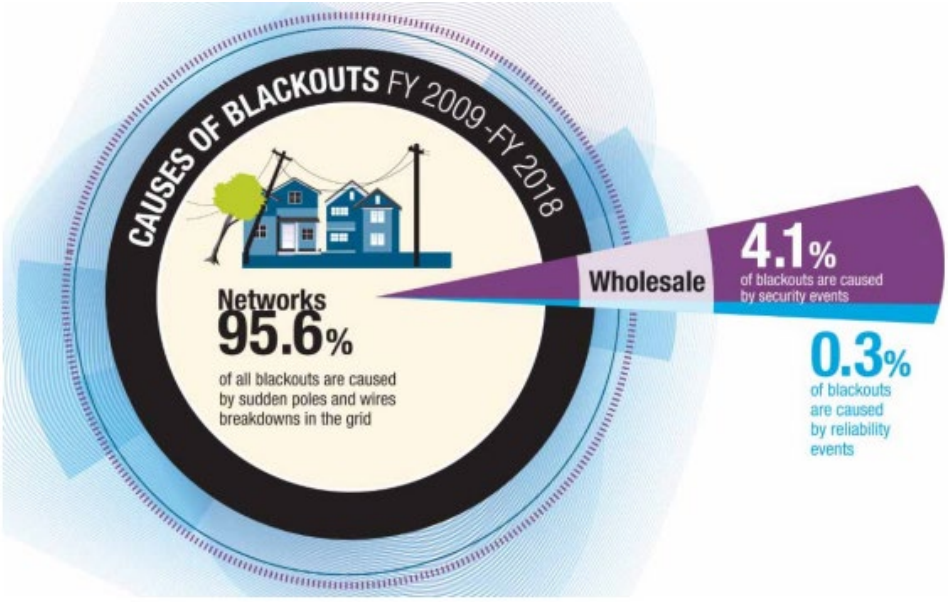
Figure 1: Actual USE[2]



Source: Panel analysis of AEMO data

It is also worth reiterating the historical causes of load shedding and how insignificant reliability events have been relative to other causes of load shedding.

Figure 2: Relative causes of customer interruption



Source: Reliability Panel fact sheet on the Reliability Standard

Chapter 3

Question 1: Further consideration of the value of customer reliability

Do stakeholders have feedback on how the value of customer reliability should be considered under the current Review, considering its intended scope?

[2] https://www.aemc.gov.au/sites/default/files/2023-03/2022%20Annual%20Market%20Performance%20Review%20%28Clean%29.pdf

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Do stakeholders agree with how the consideration of the values of customer reliability by the Panel and AEMC can be sequenced and aligned with the existing work program under the reliability framework, including the AER's VCR and the Panel's 2026 RSSR?

Do stakeholders have any feedback on the findings from the desktop review?

The VCR is a critical variable when determining the *level* of the reliability standard and the corresponding market settings to achieve that level of reliability. The AEC is concerned that this section of the Directions paper appears to be confused with the role VCR plays ie, that it is a determinant of the *form* of the reliability standard. The AEC's view is that VCR actually plays no role in determining the form of the Standard. Furthermore, if the Panel intends that it be used as an input into the form of the Standard, then the credibility of this review is in jeopardy because this review will deliver its final decision before the AER completes its next VCR estimation process.

The AEC supports the Panel engaging with the AER to enhance the current VCR methodology to better reflect how future USE events may transpire. For example, USE events may become more predicable through weather forecasting which may give customers advanced warning of potential load shedding. This may be particularly the case for any extended period or so called dark doldrum events. Hence the VCR survey, should include forecastable and unexpected USE events, of a range of durations. The AEC would like to be able to engage in this process.

The AEC considers the results of the desktop review (literature survey) to be unconvincing.

Chapter 4

Question 2: Modelling methodology and limitations Do stakeholders have any feedback on the Panel's modelling approach?

Question 3: Key definitions and assumptions in analysing the modelling results Do stakeholders consider that the definitions and assumptions used here are appropriate for characterising USE events now and into the future?

Question 4: Further work planned for the next stage of the Review Do stakeholders have any feedback on the additional modelling and analysis work needed to inform the Panel's consideration of the form of the reliability standard?

The inclusion of 82 years of weather data developed and expanded by Griffith University is a positive development. However, it appears that only two longer duration dark doldrum periods were extracted for use as a sensitivity.[3] Furthermore, it would be helpful if stakeholders can be provided with statistical analysis of this full dataset as well as improved transparency as to the process from which they were derived.

The assumptions set out in Appendix A.2 that are additional to AEMO's 2022 ESOO, ISP and IASR appear reasonable except for halving the duration of eight-hour batteries. Clearly the modellers had to amend the ISP's assumptions to create an adequate USE event dataset and this was achieved by removing significant capacity in NSW, SA and Tasmania. As well as subsequent additional calibration.

[3] Directions paper, p36.

We note the clear impacts of forecasts of USE in a number of the sensitivity cases, in particular, additional storage (sensitivity 2b), virtual power plants (VPPs) (sensitivity 3b), providing dispatchable demand response, and additional firm dispatchable generation capacity (sensitivities 5a and 5b) have the greatest effect on the depth and duration of USE compared to the chosen base case. The AEC considers that what the modelling does identify is the need for adequate firm dispatchable capacity, such as gas and liquid fuel powered generation resources (GPG) for both VRE firming and extended generation periods during long duration VRE droughts. In the latter situation, firm dispatchable generation resources (FDGR) would be likely both providing energy directly for consumer loads and outside peak demand times storage charging. It would also be likely that it would also be proving system security, strength and FCAS.

Further modelling should include:

- The actual expected generation capacity and mix. The outputs from the Draft 2024 Integrated System Plan released in December 2023 should be used.
- Allowance for normally observed demand response outcomes.
- The full 82-year VRE resource dataset. This should also be matched with the temperatures in the NEM capital cities and expected demand at the time.
- Assess the adequacy of gas infrastructure to supply GPG when it is operating in an extended operations manner.

Chapter 5

Question 5: If USE events do occur, they may be longer and deeper
Do stakeholders agree with the interpretation of the analysis, including its key finding? Do stakeholder consider any additional or alternative analysis is necessary?

Do stakeholders believe that this finding has implications for the form of the reliability standard?

Do stakeholders have views on the broader implications of this finding on the reliability framework?

The modelling has generated outcomes where USE events may be longer and deeper in an under resourced system as artificially created by the choice of input assumptions. This result is not unexpected as it has effectively been forced out of the model. However, the various sensitivity cases then raise questions as to the certainty of such an outcome and counter the view that potential USE may be longer or deeper than current forecast (potential) outcomes. We note that whilst the Panel's work is based on the 2022 ISP outputs which have then been adjusted to artificially increase the potential for USE, the Draft 2024 ISP has different outputs, especially with regards to the amount of GPG in the NEM. By 2035, the Step Change ODP has 13 GW of GPG whereas the earlier 2022 ISP had only 7 GW. We also note the Draft 2024 ISP modelled for an eight-day VRE drought. It is clear from Figure 3 that GPG primarily steps up to resolve the issue and it is worth noting that there is assumed to be 16.2 GW of GPG capacity by 20250 (which is assumed to be the year the scenario was set) yet during the VRE drought periods, GPG accounts for no more than around 10 GW (noting that Queensland is excluded).

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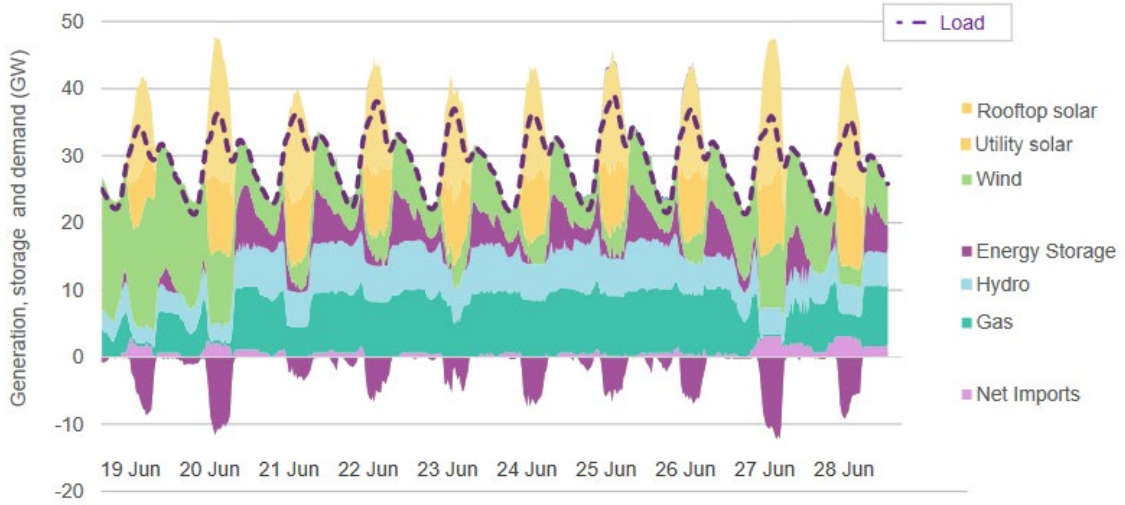
Figure 3: Operability through eight-day renewable drought, NEM excluding Queensland[4]



In developing its scenario, AEMO had access to weather data back to 1980 and the 2024 Draft ISP notes the longest wind drought was three days.[5]

Based on the modelling, including the various sensitivity cases, it is not clear to the AEC that the Panel interpretation of the potential USE outcomes is supported by evidence. Whilst for a particular chosen scenario longer and deeper USE outcomes could potentially emerge, we consider the probability of this artificial scenario to be very low when all things are considered. We recommend the Panel more fully consider the full breadth of outcomes which could emerge rather than concentrating and highlighting their views based solely on outcomes from one or two potentially very low probability scenarios. As noted previously, the AEC has significant concerns that the base case was not fully aligned with the 2022 ISP and recommend that the further modelling as part of this review, the base case be aligned with outputs from the 2024 Draft ISP. We see no clear evidence to date that a change to the form of the Standard is warranted.

Question 6: Reliability risks may shift from mainly being in summer to winter
Do stakeholders agree that the results presented in this paper support this finding, or is there further work needed?

Do stakeholders consider the shift in seasonality of the USE events has implications on what the form of the reliability standard should be?

It does appear that a high VRE penetration NEM based on some of the modelling outcomes that absent a realistic supply and demand response mix outcome the NEM is likely to shift the current balance of risk from summer to winter, however, when considering the full range of modelled outcomes, the AEC does not consider this justifies a change to the form of the reliability standard. It is also worth noting that this shift is an inference based on chosen input assumptions and historical weather patterns (eg, solar irradiation levels). With what appears to be increasing volatility in weather patterns this inference may not necessarily hold in any given year in the future and outcomes will be primarily subject to the supply and demand response mix available to the NEM at any given time. We are concerned by the use of selective scenarios to promote specific views and consider a wider range of scenario modelling is warranted before any conclusion can be arrived at.

[4] https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2023/draft-2024-isp-consultation/draft-2024-isp.pdf?la=en
[5] Draft 2024 ISP, p68.

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Question 7: USE events may be driven increasingly by weather
Do stakeholders agree that the results presented in this paper support this finding, or is there further work needed?

Do stakeholders consider an increase in the impact of weather on USE events has implications on what the form of the reliability standard should be?

Do stakeholders have views on the broader implications of this finding on the reliability framework, such as how AEMO forecasts USE in the future ESOO?

Intuitively if the NEM is more reliant on weather powered VRE, USE events may be increasingly driven by the weather. Some but not all the modelling results confirm this. In our view the more critical factor is the provision of firm schedulable capacity, both supply and demand side resources, to manage the known variability of VRE. When considering all the modelling and analysis undertaken thus far as part of this review, the AEC does not consider the necessary evidence has been provided for introducing a new form of the reliability standard. The change in the driver of potential USE events based on selective inputs assumptions does not mean the form of the standard needs to be changed. Rather, the modelling inputs and assumptions need to be tested and changed to reflect this when reliability and the potential for USE is being measured.

As observed here and in the briefing note commissioned by the Panel as part of the 2022 RSS Review, the dependence on weather has the potential, if not managed correctly in the choice of the resource mix, to alter the USE distribution.[6] However, using such a selective outcome as a justification for changing the form of the reliability standard ignores the fact that in the future there will be two energy supply functions and each will have different distributions. In the business-as-usual situation and ignoring intertemporal factors it will be:

Supply = VRE + Storage + CER + demand response + GPG[7]

The coefficients of the first three left hand side (LHS) parameters will be much greater than that of GPG which will generally merely be playing a dual firming and limited storage energy provision role. In the case of an extended VRE drought these coefficients will change in that the first three will reduce and demand response and GPG's will increase significantly. Hence, the weightings of the different sources are altered such that demand response GPG's significance has increased relative to the weather dependent parameters. This is because GPG and to a lesser extent demand response are the only energy sources that are *exogeneous* to the weather dependent parameters. Therefore, in this situation the USE distribution is primarily a function of GPG. Accordingly, the AEC recommends that the Panel take this into consideration and investigate when conducting further modelling and analysis. The AEC also considers it critical that there is adequate generation capacity and demand response that is independent of the weather if the NEO is to be satisfied during the transition.

Question 8: Events may spread across the day rather than just the evening peak
Do stakeholders agree that the results presented in this paper support this finding, or is there any further work needed?

Do stakeholders consider the change in the timing of USE events has implications on what the form of the reliability standard should be?

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[6] https://www.aemc.gov.au/sites/default/files/2022-08/Pierlugi%20Mancarella%20-%20Briefing%20note%20-%20form%20of%20the%20reliability%20standard.pdf

[7] Note that GPG refers to both gas and liquid fuel powered generation. And if in the future other technology is available with the same characteristics it would also be captured by GPG.

The information presented in the Direction's paper is not adequate for the reader to judge the "finding is considered robust with a high degree of confidence in the results."[8] As indicated previously, the use of one or two selective scenarios to justify a probable outcome is questionable and the range of potential USE outcomes will be subject to the overall generation and demand response mix. Further work or sharing more of the current work would be helpful for stakeholders. There is no evidence in the Directions Paper presented to justify changing the form of the reliability standard.

Question 9: Sensitivity analysis
Do stakeholders have any feedback on the sensitivities and the results of the sensitivity analysis?

Please see response to Chapter 4.

Chapter 6

Question 10: Shortlisted options for the form of the APC
Do you agree with the Panel's proposal to shortlist these two options as noted above? If so, which option do you prefer?

What do you consider to be the relative benefits and risks of the shortlisted options?

The AEC support's the Panel's decision to eliminate any of the APCs with secondary linkages. With respect to the two options presented the AEC is indifferent and would also like to add another option for consideration. The APC could be indexed by CPI at each Panel's review to account for the inflation that has occurred since the previous review.

When reviewing the level of the APC should be given to the ratio of the APC and the market price cap (MPC). In 2008, the AEMC noted that a $300/MWh APC represented three per cent of the Value of Lost Load (VoLL)[9] price at the time ($10,000/MWh).[10] By June 2022 the $300/MWh APC ratio to the MPC $15,500/MWh MPC had declined to 1.9 per cent. At the current MPC of $16,600/MWh, the APC represents 3.6 per cent. We are not suggesting a strict adherence to a specific ratio is necessary rather that it be considered as a useful yardstick.

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Yours sincerely,

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[8] Directions paper, p31.
[9] Since renamed as Market Price Cap
[10] https://www.aemc.gov.au/sites/default/files/content/b8c0bbc2-013a-490b-a70a-a04618f5ec1c/Final-Determination.pdf