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3 March 2022

Charles Popple
Chairman - Reliability Panel
c/- Australian Energy Market Commission
GPO Box 2603
Sydney NSW 2000

Dear Charles,

Reliability Panel - Reliability Standard and Settings Review (REL0082) – Issues Paper

This letter and attachment constitute AEMO's submission to the Reliability Panel's consultation, "Issues Paper, 2022 Reliability Standard and Settings Review", published on 27 January 2022.

AEMO recognises that while the Panel is required under NER clause 3.9.3A(d) to conduct a review of the standard and settings every four years, due to the imminent amendment of the NER by the AEMC, the Panel will only review the standard and settings that should apply for a truncated period 1 July 2025 to 30 June 2028, with the review being completed by 30 August 2022. AEMO recognises the Panel's scope is limited to the standard and settings in the context of the current energy only market, and is not a review of alternative capacity mechanisms, to be considered by the ESB after Energy Ministers/ National Cabinet endorsed the final package of reforms for the post-2025 market design work on 1 October 2021.

AEMO supports the ESB work on a capacity mechanism. A well-designed capacity mechanism can play a significant role in managing the energy transition by complementing existing reliability settings. A capacity mechanism can also enhance new investment signals, support jurisdictional reliability objectives, and minimise the risk of market interventions.

Minimising any potential shortages in supply or essential system services during this energy transition will be important considerations. Ensuring generators and flexible demand response providers are adequately compensated for all the services they provide will also support a smooth energy transition. AEMO has highlighted the record intra-day operational demand ranges in its latest Quarterly Energy Dynamics report for 2021 Q4. Intra-day ranges result in large ramping requirements to keep system in supply and demand balance. These ramping requirements would increase in magnitude and AEMO has concerns with ensuring sufficient incentives to provide these services. Hence AEMO supports the development of an operating reserve/ramping market which may have an important role in minimising any potential shortages and meeting the reliability standard.

AEMO notes that this is an Issues Paper, and as such AEMO's comments should be taken as only an initial response to the issues raised by the Panel, without benefit of modelling results commissioned for this review, and without understanding stakeholders' views.

AEMO's preliminary positions are:

- On the form of the Unserved Energy (USE) standard, AEMO has concerns with "tail-risks" and the averaging out of USE. On balance, the form of the standard is appropriate so long as the level of the standard recognises tail risks

- There is uncertainty adjudging an economic level of the standard using a “central planning” modelling technique, with the standard highly sensitive to estimates of resource cost and consumers’ willingness to pay. For example, the ESB's 2020 review of the reliability standard found that a higher level of 0.0006% was warranted, due to demand response being cheaper at the margin than load shedding. With market reforms moving towards two sided markets and improvement in automation and technology it is likely that there is a great potential for demand response and thus for a higher standard. On balance, AEMO suggests a higher standard of 0.0006% is justified and the challenge for this review is to how to achieve this higher standard, meet environmental goals, without “breaking the bank”. This would assist in allaying governments concern of reliability during the energy transition and address AEMO’s concerns on “tail risk”.
- On the Market Price Cap (MPC), the challenge for industry is to meet reliability and emissions goals more productively, rather than simply increase price. This suggests further investigation into measures that serve to reduce the costs of new resources that may improve reliability, such as increasing Demand Side Participation (DSP), incentives to productively transfer and store renewable energy, and extracting the greatest value from existing thermal generators before they close.
- Questions whether the standard, price cap and cumulative price threshold can be designed without one adversely affecting the performance of another and looks forward to the Panel investigating the relationship between the price cap and the cumulative price threshold.
- AEMO considers the administered price cap may be adequate for competing objectives, and notes trading is active in derivatives at $300/MWh because it is a natural price point to compensate for most short run costs, and so should preserve economic dispatch and minimise compensation.
- AEMO is eager to understand whether the Panel considers the floor price should change to ensure the market clears at low operational demand. A much lower price floor may incentivise more DSP / utility scale batteries but in doing so may make the management of commitment/decommitment of thermal plant more expensive and difficult. AEMO anticipates market modelling to be conducted by the Reliability Panel will inform the appropriate setting of the market floor price.

Any enquiries to this submission can be directed to Kevin Ly, GM Reform Development & Insights (interim) at kevin.ly@aemo.com.au.

Yours sincerely,

Violette Mouchaileh

Executive General Manager – Reform Delivery

Attachment – Detailed Submission

Form and level of the standard

The Panel states the efficient level of the standard corresponds to the point, and level of USE, at which the incremental cost of additional power system resources exceeds the savings to customers from the reduction in USE achieved by an incremental investment in these resources. This is the level of reliability that minimises the total societal cost electricity. The Panel will use modelling to investigate this level.

Markets are used to more efficiently allocate capital, minimise production costs, and encourage innovation. On the face of it, it is strange therefore to take a central planning approach to model total system costs, including USE, to then determine what is an efficient standard for a market to achieve. This is because if we really knew what the long-term efficient supply was, why have a market? While central planning can assist the Panel in adjudging a standard, the level of USE and setting of the price cap may always be an assessment of the point where consumers are no longer willing to pay to avoid loss of supply.

The modelling is susceptible to the assumptions of supply cost and consumer willingness to pay. If you assume a lower resource cost and high willingness to pay, then you can "afford" a higher standard.

If we assume ever increasing DSP at lower bid prices (willingness to pay), then the standard can be further increased, to the point where there is no USE at all, then USE is replaced by voluntary demand reductions. The Panel would no longer need to make the trade-off on behalf of consumers and the price cap would not bind. This implies making a "better" trade off on behalf of consumers, as the review is trying to do, is no substitute for consumers making the trade-off themselves. This explains the need for reforms aimed at removing technical and regulatory barriers to increased price elasticity of demand, below the current market price cap.

Past considerations

In November 2019, Energy Ministers requested that the ESB provide advice on interim measures to preserve reliability to transition to the post-2025 market design. The ESB found that the case for a 0.0006% standard best met the expectation that reliability be maintained through a one in ten-year summer, as specified in the terms of reference from ministers.

A rule change followed, that commenced on 21 August 2020[1], and introduced: an interim reliability measure of 0.0006%; a requirement for the RRO to use this measure until 30 June 2025; and interim reliability reserves can be, procured by AEMO when the interim reliability measure is exceeded, expiring 31 March 2025. The amendment did not change the reliability standard or settings.

The ESB's assessment was the 0.0006% standard best meets the expectation that reliability be maintained through a 1-in-10 summer as outlined in the Terms of Reference issued by COAG. The ESB highlighted the equivalence of 0.0006% to that which had been put forward by AEMO in the 2019 ESOO, where the current (0.002% USE) standard would be met in 9 out of 10 years on average.

The ESB relied on ACIL Allen modelling which found that the cost of demand response is cheaper at the margin than the cost of load shedding evidenced by the VCR. ACIL relied on anonymised RERT offer data provided by AEMO but assumed there was a low limit to the available demand response in a region. The more the demand response that is available, the higher the reliability standard can be set.

[1] National Electricity Amendment (Interim reliability measure) Rule 2020

Given the interim reliability measure only triggered the RRO but did not increase the obligation on retailers to contract to the 0.0006% level, the ESB's rule had the effect of allowing AEMO to procure long notice, 12 months, RERT for those regions with a USE forecast exceeding 0.0006%.

Consequently, greater availability of demand response resulted in lower costs of avoiding load shedding and hence a higher (i.e., less load shedding) reliability standard can be shown to be efficient.

Comments on the level and form of the standard

AEMO has concerns over the form of the standard focused on using a yearly average value for Unserved Energy (USE), which could result in quite large USE events being "averaged out" over a year in the forecast modelling, lead to no declaration of low reserve conditions and nothing being done. These large events were characterised as "tail risk". Yet because this can be accounted for in the level, there is no pressing need to change the form of the standard.

AEMO therefore considers the form of the standard is appropriate so long as the level of the standard recognises tail risks. If the Panel was to consider changing the form of the standard, AEMO would welcome time to assess the cost of updating procedures, and systems to report against that new standard. Such costs may be significant and may dissuade any change to the form of the standard.

With respect to setting the level of the standard through modelling techniques, AEMO notes there is uncertainty judging an economic level of the standard because forward estimates of resource costs are highly uncertain, particularly how variable renewable energy can be provided reliably, as is consumers' future willingness to pay[2] in a system with new technologies and potentially rising costs.

Ideally the modelling may assist in understanding the nature of the USE risk and what types or mix of resources may be suitable for meeting it. For example, elasticity of demand may be better accounted for with exposure of consumers to wholesale prices, below the current market price cap. The modelling seems to account for increased DSP as a sensitivity, and this sensitivity can explore how DSP can help to meet a higher standard like 0.0006%.

AEMO welcomes the Panel's statement on p77 of the Issues Paper where it considers a wide range of resources to be considered, including storage and demand response. A further complication to the modelling is the change to 5-minute settlement, and how this may distribute revenue between types of resource, affecting the optimum mix. Modelling the future effect of 5-minute settlement will be challenging, and the Panel should recognise this when interpreting results.

Without prejudicing the results of the modelling and the judgement of the Panel on the appropriate standard, AEMO believes a higher standard of 0.0006% is closer to what the community would reasonably expect and what the industry should achieve at reasonable cost. It is certainly true that any loosening of the standard, (and keeping the settings the same), in the face of increasing industry costs and challenges caused by integrating renewables may be unacceptable. Similar thoughts apply to retaining the existing standard and increasing settings to allow prices to rise to pay for an increase in costs. Care should be taken to avoid forecasting a more costly system, and yet adjudging it to be the most economic. The challenge for this review is to investigate how to feasibly achieve a higher standard like 0.0006% and meet environmental goals, without "breaking the bank". The most promising is increased price elasticity of demand, but transmission and better storage, firming of renewable energy may play its part as may extracting the greatest value from existing thermal generators before they close.

[2] AEMO notes the ESB has a workstream dedicated to implementing two-sided markets

Market Price Cap (MPC)

AEMO notes the Panel may not have the ability[3] to move to a tighter standard without then also adjusting the market price cap (MPC) and cumulative price threshold (CPT). AEMO also notes the MPC and CPT are set to meet the dual objective of satisfying the standard without creating risks which threaten the overall integrity of the market. Yet there is little appetite within Governments to increase the MPC or prices in general to allow for more costs to maintain or reduce unserved energy (even if modelling suggests this is economic). This is expected, because the challenge for industry is to meet higher reliability and emissions goals more productively, rather than simply increase price.

As per the 2021 guidelines, this cap on prices services two functions:

1. To enable the market to achieve and send efficient price signals, to support the efficient operation of, and investment in electricity services over the long run, and to manage participant exposure to price risk.
2. The Panel considers that the appropriate selection of the MPC to manage this trade-off is by selecting the lowest level of the MPC below the VCR that results in the reliability standard being achieved through an assessment of revenue adequacy of resources.

In a free market equilibrium, prices are set where the demand curve intersects with the supply curve. This is the point where the consumer is no longer willing to pay. A price cap foregoes the opportunity for some consumers to pay more, when they want to, artificially capping the market by reducing supply and imposing a "deadweight loss" of reduction in economic surplus. The price cap also artificially stimulates excess demand by keeping prices lower than they would otherwise have been, thus encouraging excess demand.

It is difficult to imagine these effects at prices $15,100/MWh, but if the price cap was only $1000/MWh, it would be easy to understand this would limit supply, redistribute economic surplus (profits) between producers and consumers whilst encouraging excess demand. Therefore, it is useful to question the premise whether the MPC is really binding, or whether it is only binding because of technology, structure and regulatory barriers collectively limit price elasticity of demand.

Increasing in-market DSP (below the current MPC) would increase the chances of the market clearing, but it does not guarantee it. On occasions of load shedding, use of RERT contracts, and NEM experience of limited DSP may suggest the MPC is a binding price cap. Therefore, encouraging consumers to be exposed to the wholesale price increases the chances of the market clearing. Only should it be essential, increasing the incentives to provide supply, by increasing the MPC, may be also needed to increase the chances of the market clearing.

Cumulative Price Threshold (CPT)

CPT is the maximum total energy price and total frequency control ancillary services (FCAS) price that can be reached over a period of seven days. The CPT acts to reduce the incidence of high prices over a sustained period. The 2021 Guidelines state the purpose is:

1. Cap the total price risk to which market participants exposed over a given time-period, and
2. 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 resources.

[3] 3.9.3A (f) of the NER

AEMO notes the current value of the CPT at $1,356,100 over 2016 intervals, 7 days, is $673/MWh and can protect both generators and retailers, depending on their contract positions and whether they are “long/short” to the spot price. AEMO also notes the Panel may only recommend a decrease where it has considered any alternative arrangements necessary to maintain the reliability standard.

Although designed with the very best intent, it is difficult to envisage a USE standard, MPC and CPT can be designed without one adversely affecting the performance of another. Highlighting the difficulty of increasing the MPC, AEMO looks forward to the modelling of revenue adequacy and the Panel’s consideration the CPT in meeting the dual purposes outlined above.

Administered Price Cap (APC)

After CPT is breached, an administered pricing period follows, and prices are capped at APC of $300/MWh and floored at negative of APC. The Issues Paper explains the APC is balancing competing objectives:

1. Having a sufficiently low APC so as to mitigate the risk of a systemic financial collapse of the electricity industry during an extreme market event;
2. Sufficiently high APC to incentivise market participants to supply electricity during administered price events, and
3. Having a sufficiently high APC to minimise compensation claims by market participants following an application of the administered price cap

The APC of $300/MWh appears adequate for these objectives. AEMO notes trading is active in derivatives at $300/MWh because it is a natural price point to compensate for most short run costs, and so should preserve economic dispatch and minimise compensation claims following administered price periods.

Market Floor Price (MFP)

The Issues Paper states the purpose of the MFP is to allow the market to clear during low demand periods, while preventing market instability by imposing a negative limit on the total potential volatility of market prices. The Panel suggests lowering floor would expose inflexible generators to increased risk for unit commitment constraints. AEMO considers this would also increase the cost of inflexibility and affect the financial viability of these generators. However, lowering the floor price may also encourage utility scale storage and demand response through price elasticity of demand.

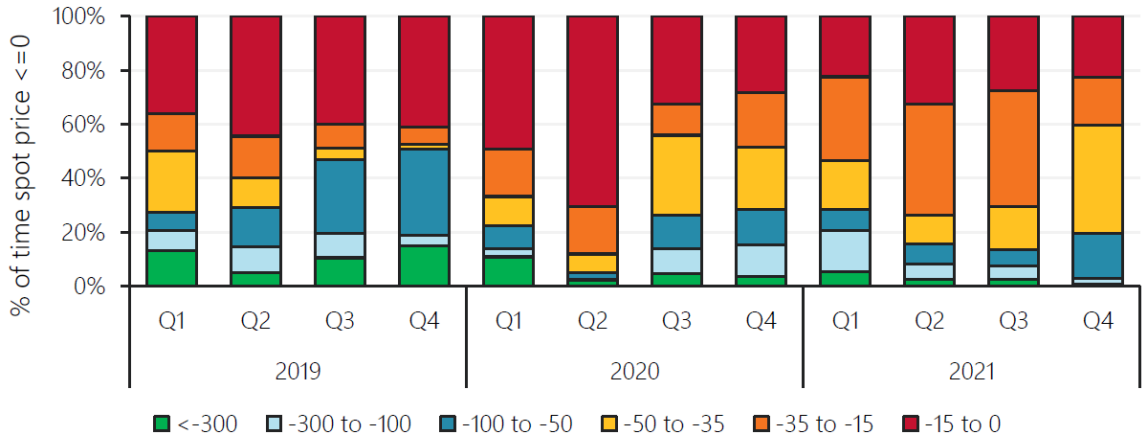
AEMO is eager to understand whether the Panel considers if the floor price should reduce to ensure the market clears at low operational demand and to improving incentives for storage. The floor price appears to be low enough to encourage rationing of supply, and to allow less flexible plant to express their commitment costs, however the incidence of MFP prices has risen in recent years[4] and there have been times of surplus supply leading to low operational demand, particularly in South Australia. This has required actions to reduce surplus supply from distributed PV[5], and applying central dispatch obligations to large non-scheduled intermittent generating units under clause 3.8.2(e)[6] of the NER. Further, the AEMC has amended the NER[7] to ensure these semi-scheduled generators comply with dispatch instructions, rather than simply curtailing generation in response to market floor prices. This has had the effect of reducing semi-scheduled plant bidding at the MFP and has increased the likelihood of the price clearing at prices far close to $0/MWh.

[4] Reliability Panel, Issues Paper, Figure B.2: The number of market floor price events
[5] https://aemo.com.au/en/newsroom/media-release/solar-pv-curtailment-initiative-by-sa-government-supports-the-nem
[6] AEMO, ADDRESSING SYSTEM SECURITY RISKS FROM LARGE NON-SCHEDULED INTERMITTENT GENERATION 29 MARCH 2021
[7] https://www.aemc.gov.au/rule-changes/semi-scheduled-generator-dispatch-obligations

The following figure is taken from the Q4 2021 QED report and shows the distribution of spot prices by price range at times when it was negative in South Australia. Whilst negative prices may have been increasing in prevalence, as may the price dropping to the floor, there seems to be some evidence the market is now clearing at less negative levels. For example, in South Australia 40% of all negative price intervals fell within the minus $35-50/MWh price band, an increase from 16% in Q3 2021.

Figure 24 Significant increase in minus $35/MWh to $50/MWh price band in Q4 2021

South Australian negative spot price band - % of the time



The MFP has similarities to the MPC, because -$1,000/MWh may be low enough to encourage reduction in output from renewables and distributed PV. Therefore, it is useful to question the premise whether the MFP is really binding, or whether it is only binding because of technology, structure and regulatory barriers that limit price elasticity of demand (in this case consumers that could reduce PV). Like the MPC, increasing wholesale price signals to distributed PV at low prices would increase the chances of the market clearing before hitting the floor, but it does not guarantee it. For this reason, it is worth questioning whether the floor price needs adjusting to encourage more flexibility in the system and incentives for storage to manage surpluses of supply/generation.