Shell ENERGY

3 March 2022

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

Submitted electronically

REL0082 - Issues Paper: 2022 Reliability Standard and Settings Review

Shell Energy welcomes the opportunity to provide feedback to the Reliability Panel's (Panel) 2022 Reliability Standard and Settings Review Issues Paper. We look forward to engaging with the Panel throughout the review process.

About Shell Energy in Australia

Shell Energy is Shell's renewables and energy solutions business in Australia, helping its customers to decarbonise and reduce their environmental footprint.

Shell Energy delivers business energy solutions and innovation across a portfolio of electricity, gas, environmental products and energy productivity for commercial and industrial customers, while our residential energy retailing business Powershop, acquired in 2022, serves more than 185,000 households and small business customers in Australia.

As the second largest electricity provider to commercial and industrial businesses in Australia[1], Shell Energy offers integrated solutions and market-leading[2] customer satisfaction, built on industry expertise and personalised relationships. The company's generation assets include 662 megawatts of gas-fired peaking power stations in Western Australia and Queensland, supporting the transition to renewables, and the 120 megawatt Gangarri solar energy development in Queensland.

Shell Energy Australia Pty Ltd and its subsidiaries trade as Shell Energy, while Powershop Australia Pty Ltd trades as Powershop. Further information about Shell Energy and our operations can be found on our website here.

Key Messages

The key messages of this submission are provided in the following points. The full reasoning behind each point is contained in the body of the submission.

- The form and level of the reliability standard remain fit for purpose in an energy only market.
- Increased concern about reliability outcomes is likely based on an incomplete assessment of the available data.
- Unserved energy remains the most appropriate measure for reliability as it is the best relative measure that fully captures all information on reliability events.
- The current approach to the market price cap balances risk with a technology neutral price signal that encourages efficient market operation and investment.
- The market floor price continues to provide a valuable function with no demonstrated need to adjust the level.
- A negative cumulative price threshold should not be contemplated as it is not beneficial to consumers and would remove a disincentive to excess generation to reduce output.
- The current approach to the cumulative price threshold remains appropriate as it provides protection to consumers while maintaining investment signals.

[1] By load, based on Shell Energy analysis of publicly available data.
[2] Utility Market Intelligence (UMI) survey of large commercial and industrial electricity customers of major electricity retailers, including ERM Power (now known as Shell Energy) by independent research company NTF Group in 2011-2021.

- The administered price cap should remain at the current level as it is supported by compensation mechanisms for more costly resources that are dispatched during these periods.
- Shell Energy strongly supports keeping technology neutrality central to determining the form and levels of each reliability setting.
- There is likely to be little value from extensive 5 minute modelling and fully co-optimised FCAS modelling. Targeted examination of crucial periods or scenarios will provide more value from these tools.

Should you have any questions regarding this submission please address them to Peter Wormald (peter.wormald@shellenergy.com.au).

Sincerely,

Libby Hawker

General Manager Regulatory Affairs and Compliance

UNRESTRICTED

General Comments

Shell Energy considers that the current form and level of the reliability standard and associated settings remain fit for purpose should the current energy only market be retained. However, should a form of proposed capacity mechanism be approved and implemented, the level of some of the settings may need to be reviewed. Shell Energy considers that the Reliability Panel should be tasked with considering and recommending the level of the reliability settings that would apply if implementation of a capacity mechanism is approved. We consider that the Reliability Panel is best placed to consider and recommend the level of the reliability settings that should apply.

Whilst the Issues Paper sets out that reliability concerns may have increased as the market transitions, it is not clear to Shell Energy that this is the case. We understand that this concern may be related to an increase in the level of declarations of forecast lack of reserve (LOR) conditions being issued in the short term projected assessment of system adequacy (STPASA) and sometimes in the pre-dispatch period. The majority of these are cancelled prior to dispatch. Many of these forecast outcomes occur due to a combination of the implementation of the forecasting uncertainty measure, the choice of supply side availability used and the accuracy of forecasts for consumer demand and semi-scheduled generator output used in the reliability assessment process.

We note that the Issues Paper also refers to comments in the 2021 Electricity Statement of Opportunities with regards to reliability forecasts within the timeframe this review is required to consider. The 2021 ESOO notes:

> *'This ESOO report however forecasts USE for Victoria in 2028-29 and both Victoria and NSW in 2029-30 and 2030-2031 will both exceed the reliability standard, if further investment in new capacity or demand reduction was not forthcoming by that time.'*

In our view this is highly conservative and the key consideration in this statement is, "if further investment in new capacity or demand reduction was not forthcoming by that time". We believe the Panel must consider in their analysis the historical investment outcomes observed in the NEM as well as the significant level of investment projects that are set out in AEMO's Generator Information Page. Whilst previous ESOO's have forecast the potential for significant levels of USE in the current period, we note that the medium term PASA shows no exceedance of either the interim reliability measure or the reliability standard.

We acknowledge that not all of the projects shown in AEMO's Generator Information Page will move through to completion. However, we are confident that a large portion will and that there are other projects not currently shown in AEMO's Generator Information Page that will also proceed. The Panel must also note that only those projects listed on the page that have met the rigorous committed project standard are included in the ESOO's reliability assessment calculation. This same rigorous committed project standard is also applied to transmission projects and may exclude a project even when the project has passed the regulatory test and has approved project funding as a regulated asset from the Australian Energy Regulator.

Shell Energy notes and supports the Panel's view that the historical reasons for the contracting and use of the reliability and emergency reserve trader (RERT) have largely been in response to power system security events. Even when RERT has been contracted and dispatched for potential reliability purposes, this has primarily been for the maintenance of reserve margins, as opposed to the prevention or reduction in any involuntary load shedding.

The Issues Paper indicates that reducing synchronous generation and increasing levels of energy storage and variable renewable generation may have implications for the optimal form and levels of the standard and settings. These changes are assessed in AEMO's long and medium term reliability assessment processes. AEMO models multiple years of varying intermittent generator output based on geographical location as well as assigning conservative estimates of supply resource from short term energy storage systems. As the outputs from AEMO's modelling already incorporate changes in generation mix and technology in the reliability assessment, which will feed into the Panels assessment, we question if the Panel by also including this in their considerations for the reliability standard and settings would double count the impact of these changes.

Changes in Demand Trends

The Issues Paper indicates that whilst summer maximum demand outcomes have remained reasonably static, or may have decreased, the Panel has raised some concerns with regards to recent observed increases in winter maximum demand outcomes. We recommend that the Panel carefully consider the observed weather outcomes that led to this and how actual outcomes compare to AEMO's forecast range. The outcomes observed in general fell within the range of outcomes included for in AEMO's reliability assessment modelling. The Panel should also consider that generation and transmission capability which can be impacted by higher ambient temperatures is less likely to be impacted during cooler temperatures.

We support the view in the Paper that the potential uptake of electrical vehicles (EV) and the impact on peak demand and evening ramp rates is uncertain. We support the Panel's intent to address the uncertainty in EV uptake

UNRESTRICTED

and charging behaviour in the scenarios and sensitivities modelled for the review. In our view such modelling must include the impact of time of use tariffs and controlled load frameworks for EV charging. We also recommend that the Panel consider work already undertaken by AEMO in this area which is included in AEMO's long and medium term reliability assessments.

Whilst we acknowledge past and potential future demand side changes, what is less clear is how these changes interact with the Panel's assessment of the reliability standard and settings. Assessment of the standard and settings should continue to be based on ensuring the ongoing supply to consumers based on forecasts of consumer demand and supply side resources which are currently provided to the Panel by AEMO. If the Panel has concerns regarding these forecasts we consider they could be best addressed through the sensitivity analysis to be undertaken in the modelling as part of this review.

Form and level of the reliability standard

Shell Energy does not consider that there is value in the Panel changing the form of the reliability standard. Shell Energy notes that the Panel and the AEMC have previously considered (on numerous occasions) a range of alternative forms for the reliability standard. Shell Energy agrees with the Panel's 2016 position that:

> *"…the best way to determine if there has been sufficient capacity investment to meet customer demand is to measure the extent to which all customer demand has been met. A volumetric measure of energy demand met, such as USE, provides an optimal measure of the relative effectiveness of the NEM to meet customer demand."* [3]

Whilst Shell Energy understands the scale of the changes in the electricity market expected over the timeframe covered by this review (2024 to 2028), it is unclear how any of these proposed or forecast changes would warrant a change in the form of the current standard which has been set based on consumer expectations of supply reliability. We believe that the market has been well served by maintaining the current form of the standard due to the predictable outcomes from previous reviews. It must also be noted that historically consumer interruptions due to reliability USE events have been small when compared to interruptions due to issues in the distribution network. It is critical that the Panel resist attempts to target much higher wholesale market reliability given its relatively small impact on consumers. The increased costs to achieve such an outcome must be carefully considered against the level of benefits it may bring to consumers.

Shell Energy makes the following observations about the alternative reliability standard forms described in the Issues Paper:

- A 'frequency of interruptions' reliability standard has limited utility. Shell Energy understands that, while frequency of interruptions contributes to consumer frustrations, the total time offline is the major issue. It is also worth noting that the cumulative impact of frequent interruptions is already included in the output from AEMO's reliability assessment modelling.
- A 'maximum probability of USE' reliability standard is equivalent to changing the level of the existing percentage of USE form. For example, a standard based on a 10% probability of exceeding (POE) 0.002% USE is statistically similar to having a standard based on 0.0006% USE. We consider the Panel should also note that the current methodology for forecasting USE where scaling is applied to historical demand traces to achieve a 10% POE demand forecast in all years already statistically captures the "tail risk" section that the change to a 'maximum probability of USE' is intended to capture. This proposed measure could simply duplicate a risk that is already captured.
- A 'maximum probability of any lost load' reliability standard takes no account of the magnitude or duration of load shedding. As such, it does not accurately reflect how consumers value reliability, and is therefore an inferior metric to USE as a percentage of total load.
- A 'volumetric buffer' is a deterministic standard that is effectively a function of the number of generators in service at any given time. As such, there is no direct link to how consumers value reliability. It has previously been considered and rejected as a high-cost option.

There is no compelling rationale to justify changing the form of the reliability standard recognising that all proposed alternatives have major drawbacks and given that the existing form of the reliability standard has thus far been demonstrated to meet consumers needs and has not been shown to be ineffective in achieving investment and operational outcomes. This conclusion is also supported by the fact that the Panel and the AEMC have considered

[3] Reliability Panel, *Review of reliability standards and settings guidelines, final determination*, 1 December 2016, pp 22. Accessed from: https://www.aemc.gov.au/sites/default/files/content/b143b076-45c4-4b08-8296-778d03b5d7c8/REL0059-Final-determination.PDF

UNRESTRICTED

this issue on numerous occasions and confirmed on each occasion that the current unserved energy based standard is superior to all other proposed standards.

We disagree with the assertion in the Issues Paper that USE as currently implemented does not include for the potential depth or duration of specific USE events. Any measurement of actual USE includes these features and AEMO's current stochastic modelling methodology includes the full range of potential outcomes including high impact low probability tail risk events. Introducing a probability of occurrence or exceedance measure will, in our view, duplicate loss of supply outcomes that are already modelled in AEMO's reliability assessment.

When considering the question of the level of the reliability standard, Shell Energy believes that the Panel must also include the analysis from the Value of Customer Reliability (VCR) review undertaken by the AER in 2019 as well as the VCR values. This review indicates that the absolute levels of VCR for the different customer classes remained static or in some cases decreased since they were assessed by AEMO in 2014. The Panel should also consider the level of interruptions considered acceptable by consumers due to issues in the distribution network, in return for no further increases in network costs. This may provide useful guidance regarding the economic trade-off to improve what is already a high level of wholesale market reliability. The Panel should include analysis for both relaxing as well as tightening the standard.

When considering the form and level of the reliability standard the Panel must include the impact of the recently introduced wholesale demand response (WDR) mechanism. We also recommend that the Panel consider the potential for new consumer load technology, such as hydrogen electrolysers, to connect as flexible scheduled load. WDR and cost based curtailment of scheduled load are not and should not be considered as USE for the purpose of setting the form and level of the reliability standard.

Market Price Settings

Market Price Cap

Shell Energy supports the current approach to determining the level of the market price cap (MPC) as it balances risk with a technology neutral price signal that encourages efficient market operation and investment. Determining the lowest level below the value of customer reliability that will result in the reliability standard being met provides a robust analytical basis for determining the market price cap.

Based on the current energy only market design, Shell Energy urges the Panel to exercise caution in any scenario where the level is found to be materially lower than current market expectations. Implementing a lower market price cap would remove significant value from existing assets, many of which have made investment decisions and re-investment decisions on the basis of the current market price cap regime. Similarly, materially increasing the level of the MPC would increase risk in the market without necessarily resulting in an increase in investment that would have occurred absent this increase.

We support the Panel's consideration of recent market design changes, ie 5 minute settlement, as well as potential changes when determining the appropriate level for the MPC. In considering the change to 5 minute settlement we recommend the Panel include in its analysis the inherent physical capabilities of the various technologies as they operate within the new market design. We also recommend consideration of limits imposed on some technologies such as the requirement to ramp output in a straight line between dispatch targets and the 20 percent of registered capacity per minute ramping limits which have been placed on some technologies.

Shell Energy considers that the current single value form of the MPC has and will continue to maintain a technology neutral approach to the maintenance of power system reliability and enables the market to send price signals that support the efficient operation of and investment in electricity services over the long run, while managing participant exposure to price risk. It is unclear to Shell Energy what alternative form the MPC could take and we consider the current $/MWh form to be the most appropriate. If the Panel's intention was to indicate that it is considering varying MPC by technology or service delivery, we urge the greatest caution be taken. All impacts to current market design features including bidding, market pricing, dispatch and settlement as well as any bias this may introduce in technology selection in the investment framework must be considered, including particular emphasis on analysis of the disbenefits of such a change.

Market Floor Price

In Shell Energy's view, the concept of a negative cumulative price threshold (CPT) does not merit detailed consideration. The rationale for the current maximum CPT and administered price cap (APC) is ultimately to protect consumers from exposure to sustained high prices without eliminating the price signals necessary to incentivise new investment. Negative prices are in the benefit of consumers, so there is no clear reason for a negative CPT. Similarly, a negative CPT would mute the negative price signal, which incentivises generators to lower their output. This signal

UNRESTRICTED

to generators to reduce output is an important market mechanism as it enables AEMO to manage the supply/demand balance and therefore operate the power system securely. The stronger the negative price signal is, the more clearly it incentivises flexible load (e.g. storage charging), and disincentivises generation when it is not valued (or rather, is explicitly disvalued) by the market. This helps to achieve efficient real-time market outcomes, facilitates secure operation of the power system, and provides investment signals for plant capable of providing the flexibility the market values. This is consistent with achieving the NEO.

Without detailed analysis to support changing or automatically indexing the level of the MFP we do not support such changes. The market floor price (MFP) was originally set sufficiently low to allow less flexible generators with different cycling costs to differentiate themselves through their negative bids. This was designed to reduce distortion and enable the market to clear efficiently on a consistent basis. In our view the current value of the MFP has achieved this outcome. There is a lack of analysis to suggest the current level of the MFP is too high to support this outcome or that it will fail to do so in the future. Similarly, there is no data to suggest that the lack of indexation applied to the MFP has or will lead to a change in this outcome.

Shell Energy does not support the introduction of varying technology or service delivery based MFP's. We urge the greatest caution be taken in considering such a change. A change such as this should only be introduced following detailed analysis. To date the single value form of the MFP has led to efficient outcomes in the market and no data or analysis has been presented to support consideration of a change to the form of the MFP.

We do not consider that the introduction of an essential system services market would impact either the form or level of the MFP. A generator dispatched for the provision of essential system services would not be allowed to respond in Dispatch to MFP price outcomes. The MFP in this case would remain active only for those generators not dispatched for the provision of essential system services.

Cumulative Price Threshold

As noted above, Shell Energy considers an important purpose of the CPT to be the protection of consumers from exposure to sustained high prices without eliminating the price signals to incentivise new investment. From this perspective we view the current level and form of the CPT to be appropriate to provide this protection while also leaving sufficient signals for new investment. This view applies is both the energy and FCAS markets. Shell Energy does not support the introduction of varying technology or service delivery based CPT's and urge the greatest caution be taken in considering such a change.

Administered Price Cap

The issues paper raises the Panel's concern that the level of the administered price cap (APC) may be below the price at which demand response providers are willing to decrease their load. To some extent, this issue may be addressed by the AEMC's wholesale demand response (WDR) mechanism final determination, which makes it clear that registered demand response service providers can "claim compensation following the application of an APC" [4] to ensure they do not operate at a loss. Nevertheless, an increase in the APC would lead to additional costs to all consumers and this should be carefully balanced against the benefits of incentivising demand response providers, particularly when supply-side solutions are economic at the current levels.

The issues paper also notes that the operating cost of energy storage systems depends on price variation, which may be impacted by the APC during an administered price period (APP). However, it is not clear why this would warrant a change in APC. All generators (including storage) are entitled to compensation to cover marginal costs if they are scheduled to generate during an APP and the APC is below marginal costs.

It is also not clear why a potential profitability impact on energy storage systems during an administered price period should lead to a change in the administered price cap. Previous reviews of the APC have favoured maintaining the current level to mitigate the systemic financial risk to the electricity sector. Whilst taking this view, previous reviews have also noted that costs associated with some generation resources are higher than the APC. We support a similar conclusion regarding energy storage.

When considering the appropriate level of short-run marginal cost (SRMC) to be assigned to energy storage systems (ESS) in addition to an opportunity cost-based value, the Panel should consider the historical costs of input energy adjusted for losses associated with round trip efficiency as a suitable proxy for SRMC of ESS. This treatment would align with the current use of a fuel cost-based assessment for other generation technologies.

[4] AEMC, *Wholesale demand response mechanism, Rule determination,* 11 June 2020, pp 234-237. Accessed from: https://www.aemc.gov.au/sites/default/files/documents/final_determination_-_for_publication.pdf

UNRESTRICTED

Modelling for the Review

Shell Energy supports the modelling approach and principles proposed by the Panel in its issues paper. We agree that detailed, time-sequential modelling is crucial to assessing reliability as energy storage and variable renewable resources make up an increasing proportion of the supply assets. However, it is not clear that material benefit will result from undertaking extensive 5-minute modelling. A more efficient approach may be to examine the effect of 5-minute resolution on the modelling at key periods, for example during a sample of high rate of change of demand (or supply) periods or only during identified actual lack of reserve (LOR) or USE periods. The impact of the higher resolution could then be assessed and generalised across the modelling.

A similar approach may be appropriate for FCAS modelling. Shell Energy agrees that a fully co-optimised approach may not add sufficient value to justify the additional complexity. However, supplementing higher level FCAS outcomes with results from FCAS results from targeted, detailed examination of crucial time periods may provide additional insight into the value and contribution of some technologies. Crucial time periods in this case may include times where low levels of synchronous generation are connected to the grid or periods where model conditions match an actual LOR event.

To ensure that the assessment is robust It will also be crucial that the modelling assess a wide range of weather patterns. Shell Energy supports the proposed use of the modified historical 10 years of supply and demand data from AEMO's ESOO modelling process. This data it is likely to provide sufficient examples of the extremes which could be potentially faced by the electricity supply system in the future. We note that AEMO's ESOO modelling input assumptions already contain scenarios that represent the tail risk for renewable supplies. These ESOO scenarios include correlated, multi-region wind droughts and concurrent storm activity across renewable energy zones. To acknowledge the nature of these events it will be necessary to appropriately weight these scenarios, which may mean over-weighting since these periods will increasingly be the focus of investment for reliability. Where the Panel creates scenarios in addition to the range of the that included in AEMO's ESOO modelling, the Panel must ensure that detailed explanation of the scenario and the reasoning for its inclusion is provided to allow for stakeholder assessment.

Any assumptions in the modelling regarding perfect foresight for energy limited storage may lead to a higher assessment of reliability than will eventuate in reality. The approach taken by the modeller to implement or approximate imperfect foresight will be crucial to the modelling outcomes and consequently the assessment of the reliability settings. Shell Energy understands that amongst market modelling consultants there is a range of approaches to modelling storage dispatch dynamics. There may also be limited flexibility in implementing variations to the standard modelling approach used by the modeller. The ability to implement a fit-for-purpose approach to modelling storage may therefore become an important assessment criterion when selecting the modelling consultant. Even then outcomes from such modelling would contain a degree of subjectivity. Alternatively, energy limited storage for the purpose of this modelling could be modelled as a time-based capacity solution and considered available to meet an equivalent capacity value over this time period. For example, a 100MW/200MWh ESS would be available for 50 MW of output if a uniform four-hour time period was assumed. The capacity would be further discounted by assigning a portion of this capacity for the provision of FCAS. This would tend to provide a lower (conservative) assessment of reliability than is likely to occur in Dispatch. This is the solution currently adopted by AEMO in its ESOO modelling.

Shell Energy agrees that demand response is an important provider of reliability services in the NEM. However, we also note the difficulties in assessing it as a new entrant due to its uncertainty. AEMO has undertaken significant work in this area and whilst adopting what stakeholders generally consider to be a conservative approach to the value of demand response, the input values as used in the ESOO modelling would in our view be considered acceptable to most stakeholders. We agree that in considering current levels of demand response the modelling should consider the sensitivity of demand response as an adjustment on the demand side in response to different pricing levels rather than being counted as a new entrant power system resource for the purposes of setting the market price cap. Where the Panel models scenarios including the entry of new industrial load, we recommend that flexible industrial load should be modelled as scheduled load.

UNRESTRICTED