



Your Ref: REL0082

3 March 2022

Graham Mills
Australian Energy Market Commission
Submitted online to: www.aemc.gov.au

Dear Mr Mills,

Submission: 2022 Reliability Standard and Settings Review

CS Energy welcomes the opportunity to provide a submission to the Australian Energy Market Commission's (AEMC's) *Issues Paper 2022 Reliability Standard and Settings Review (Issues Paper)*.

About CS Energy

CS Energy is a Queensland energy company that generates and sells electricity in the National Electricity Market (NEM). CS Energy owns and operates the Kogan Creek and Callide B coal-fired power stations and has a 50% share in the Callide C station (which it also operates). CS Energy sells electricity into the NEM from these power stations, as well as electricity generated by other power stations that CS Energy holds the trading rights to.

CS Energy also operates a retail business, offering retail contracts to large commercial and industrial users in Queensland, and is part of the South-East Queensland retail market through our joint venture with Alinta Energy.

CS Energy is 100 percent owned by the Queensland government.

Key recommendations

CS Energy is supportive of the Australian Energy Market Commission's (AEMC's) review of the Reliability Standards and Settings. Given the changing market dynamics as the NEM transitions and decarbonises, this review is timely. CS Energy recommends maintaining the current settings at a minimum, however a review of all settings by the Panel is beneficial to ensure they are providing appropriate investment signals.

While CS Energy acknowledges the different objectives, as outlined in the Issues Paper, of NEM planning documents, such as the Electricity Statement of Opportunities (ESOO) and the Integrated System Plan (ISP), these documents are new publications since the previous review conducted by the AEMC. It will be important for participants that there is a level of consistency between these documents and the input assumptions used in modelling the appropriateness of the reliability standard and settings. Any material

Brisbane Office
PO Box 2227
Fortitude Valley BC Qld 4006
Phone 07 3854 7777
Fax 07 3854 7300

Callide Power Station
PO Box 392
Biloela Qld 4715
Phone 07 4992 9329
Fax 07 4992 9328

Kogan Creek Power Station
PO Box 41
Brigalow Qld 4412
Phone 07 4665 2500
Fax 07 4665 2599

deviations of assumptions should be substantiated to maintain confidence and transparency.

Further detail on CS Energy's response to the Issues Paper is set out in the stakeholder feedback below.

If you would like to discuss this submission, please contact Andrew Broadbent (Senior Strategy Analyst) on (07) 3854 7377 or abroadbent@csenergy.com.au

Yours sincerely



Dr Alison Demaria
Head of Policy and Regulation (Acting)

NEM in transition

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, 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?*

It is clear the National Electricity Market (**NEM**) is undergoing a structural transition, with increasing decentralised variable renewable energy (**VRE**) connecting and centralised thermal generation capacity exiting the market, either for economic or technical reasons. Given the uncertain pace, mix, interdependencies and final form of the transition, assessment of the reliability standard and settings will become increasingly challenging and may have to occur more frequently than the current cycle.

These assessments must consider:

- greater technological variability of grid connected assets;
- an increased number of individual connection points;
- requirement to have many smaller resources respond in a coordinated manner (e.g. distributed energy resources (**DER**)); and
- managing a system with a higher percentage of two-way energy flows

The implications of these factors include:

- managing a grid that has diverse technologies with different physical capabilities, yet have the same suite of investment signals and incentives;
- weather variability impacting both supply and demand. Historically, weather has had a dominant impact on demand; and
- greater decentralisation of resources, requiring physical transmission capability to be considered in a more focused manner

In addition to the factors identified by the AEMC regarding economically driven retirement decisions, other factors for consideration include:

- Long-term commodity price outlooks, including the ability and willingness of participants to secure long-term contractual agreements;
- Investment trade-off between varying the units technical capability (i.e. minimum safe operating level and rate of change) to compete with other technologies and the returns available in an uncertain outlook;
- Changes in government policy, including assessment of how changes in carbon policies impact different technologies;
- Unit cycling opportunities driven by minimum demand and the total fixed cost of the asset; and
- Publicly disclosed documents that detail a specific decarbonisation trajectory

Question 2: Changes on the demand side

- *How do recent and expected future demand side trends interact with the Panel's assessment of reliability standard and settings? What are the implications of these trends for the reliability standard and settings?*

As the NEM decarbonises, there will be a range of impacts on operational demand, many of which have been identified.. While the AEMC notes that minimum system load (**MSL**) is not an element of the formal reliability framework, the impacts of how thermal units can respond (and the limits on those responses) to lower and lower minimum demands should be considered in making assessments of the reliability settings and their appropriateness moving forward. The technical capability of thermal units to respond to material swings in intra-day operational demand will be increasingly challenged. These challenges may not be explicit when reliability is modelled, however are critical in achieving the reliability standard. To overcome this, the AEMC may consider as part of this review different settings based on the technical capability of each asset class.

The AEMC highlights that electric vehicles (**EVs**) may become a material source of demand, however this should be approached with caution and is unlikely to occur over the period to 2028. Currently, there are limited EV models available on the Australian market with vehicle-to-grid (**V2G**) technology and capability. Historic trends of consumer charge and discharge behaviour has not been demonstrated at scale but will be a key input assumption when undertaking modelling for the reliability standard. It is likely this behaviour will be highly influenced by appropriate pricing signals, which are still to be established. As demand from EVs becomes material, ensuring a coordinated response, with sufficient scale at exactly the time required, must be demonstrated to ensure confidence in achieving the reliability standard.

The AEMC identifies that the Wholesale Demand Response Mechanism (**WDRM**) recently implemented may provide clarity on demand response and consumer price sensitivity. It is important to note that this mechanism is currently only available to Commercial and Industrial (**C&I**) customers, not households as implied in the Issues Paper. The AEMC note the continuing uptake of household appliances, however offsetting energy efficiency measures of these appliances should be considered in assessing any future demand growth (i.e. extrapolation of historic demand growth risks overstating future household demand).

Finally, the AEMC highlight hydrogen may be a highly flexible source of load and demand response. Assessing this scale should not assume all hydrogen projects are grid connected. Recent announcements by proponents indicate the intention of some projects to be 'closed loop' or not grid connected. This will reduce the resources available to participate as a source of highly flexible load and demand response as indicated in the Issues Paper. Again, the number of projects connected in the relevant period (to 2028) is likely to be minimal.

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 of the primary considerations is the requirement of thermal units to operate within a larger range. Individual unit's rate of change capability, or lack thereof, may not be evident in modelling reliability, however, may result in a physical limitation in achieving actual reliability. As the operational demand profile continues to change structurally, this will become vital to system operation.

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 impact on the reliability standards and settings is contingent on the final form Post-2025 market design reforms take. A capacity mechanism is currently under consideration as part of this suite of reforms. If this mechanism is adopted as proposed, it is essential the settings are reviewed by the Reliability Panel.

Question 5: Impact of Government policies on reliability settings

- *What implications does continued uncertainty in emissions policy have for the reliability standard and settings?*
- *What are your views on the impact of State and Federal government energy policies on the reliability settings?*

No comment

Panel Assessment Approach

Question 6: Other considerations for the panel to take into account

- *In addition to the other considerations set out above, do you consider that there are factors that the Panel should have regard to?*

No comment

The reliability standard

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?*

No comment

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 CS Energy's view, Unserved Energy (**USE**) remains an appropriate measure for the reliability standard. Given the uncertain pace of the NEM's transition, and associated risks driven by coordinating resources and industries, presenting USE as a probability as proposed by the AEMC may provide an additional level of clarity. If this is adopted, it is important that USE is managed consistently to a single measure. Variability of measures may create investment uncertainty for participants and have adverse implications in achieving the least cost for consumers as required by the National Electricity Objective (**NEO**).

The AEMC also note the potential reliability events that may occur because of weather patterns. Given weather variability remains a key consideration, with VRE being a more dominant generation technology, presenting the reliability standard at a more granular level than the current requirement (by financial year) may provide additional clarity. There is consistent historic evidence that VRE technologies have a higher or lower capacity factor in certain quarters.

Question 9: Changes in the amount of DER and its effect on the reliability standard

- *Over the period 2024 – 2028, is the amount of DER within the NEM likely to materially change the way that consumers value their reliability of electricity supply?*
- *Are there any other issues of relevance for the Panel to consider for its review of the reliability standard.*

As electrification accelerates, and more DER is deployed across the NEM, it is likely that different consumers will place a higher or lower level of value on reliability. As the market is still maturing, this impact may be reduced in the 2024-2028 period, however the AEMC should consider the implications in future reviews.

There are a range of considerations that will influence how consumers value their reliability, including:

- The opportunity cost, which is determined by ensuring appropriate price signals are in place for DER;
- Their level of willingness to provide control of their DER to a third party (e.g. their retailer); and
- Whether their behaviour patterns change in times of scarcity (i.e. if they can maintain supply, rather than lose supply to benefit the whole system, does their behaviour change)

When incorporating DER into future modelling, the AEMC should consider:

- Can DER respond with sufficient scale and in a coordinated manner that coincides exactly with the period of a reliability shortfall (or to avoid a shortfall);
- Whether there is sufficient, defensible, historic evidence of consumer behaviour and if future trends alter the historical evidence;
- The willingness of consumers to provide control of their DER to a third party (e.g. their retailer);
- How transparency of modelling is ensured, providing confidence that DER is not distorting results (e.g. used as a 'gap fill' for reliability being met); and
- Whether there is a notional upper limit for DER given technical or physical limitations of the technology or the NEM

The Market Price Settings

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?*

CS Energy considers the MPC continues to enable a technology-neutral investment signal in the most cost-effective way. It remains an effective investment signal for technologies, however the AEMC may want to consider how different durations of storage (e.g. shallow vs. deep) is provided timely investment signals. For example, the MPC may provide investment signals for shallow storage, yet not for deep storage requirements in the event of low probability, high impact weather events (e.g. renewable droughts). This may, in part, be the role of the CPT (or a future capacity market), however an event must occur to trigger the CPT, which may not result in achieving a least cost outcome for consumers.

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?*

Given the transition of the NEM, there is opportunity for the AEMC to consider the appropriateness of the MFP. However, any consideration should recognise that the MFP was designed as an operational signal, not an investment signal. In the event the MFP changes, any change should ensure an operational signal remains for participants to respond to, and this may not be technology neutral given the different capabilities of VRE and other resources.

In conducting a review, the AEMC should also consider:

- How changes impact energy arbitrage opportunities and behaviour;
- The impact 5-minute settlement has had on bidding strategies of VRE resources;
- Contractual arrangements of Power Purchase Agreements (**PPA's**). Many PPA's now include conditions regarding minimum dispatch prices
- How automated bidding software may minimise the effect of changes to the MFP

In CS Energy's view, there is limited requirement to consider a negative CPT. Historically, it is rare the CPT is triggered. Participants are likely to change their bidding strategies to avoid extended periods of negative prices, reducing the requirement for a negative CPT. Participants have a limited ability to respond in an environment where a positive CPT is triggered, as this has historically occurred in periods of scarcity. Equivalent periods of surplus (i.e. the risk exposure a negative CPT would limit) is unlikely. A technology specific MFP should not be considered by the AEMC at this point. There is ongoing work under the ESB workstreams, and these should be completed prior to the AEMC considering a technology specific MFP.

In CS Energy's view, there may be benefit in reducing the MFP over time, given the changing system requirements and the original intent of the MFP. In considering changes the AEMC should maintain an awareness of any regulatory risk imposed on participants by changing reliability standards. The AEMC should ensure that appropriate operational signals, the original intent of the MFP, remain.

Since the introduction of 5-minute settlement, it has been observed that some participants (namely VRE) are not bidding in at the MFP. They are bidding their generation at a price reflective of the value of environmental certificates¹. It should be acknowledged that this will be project specific and other factors, such as clauses in PPA's, will be considered by participants in developing their bidding strategies.

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 form of the CPT remains appropriate for encouraging investment signals in a technology-neutral manner, however the AEMC may consider the market signals for shallow and deep storage as noted in the MPC section. Given the changing mix of technologies in the NEM, the level of the CPT may benefit from a review by the AEMC. The current period of 7.5 hours may not be sufficient to provide market signals to deep storage. Any changes to the CPT must assess the impact on participants approach to, and levels of, risk management.

¹ AER: Wholesale Markets Quarterly Q4 2021 Report, p.4

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?*

Broadly, the APC remains appropriate, in form, and providing investment signals to participants. The APC would benefit from the AEMC's consideration of how the level of the APC impacts revenue streams from hydro and utility scale batteries.

Given recent volatility in global commodity markets, the Short-run Marginal Cost (**SRMC**) of some generator units, particularly in NSW, may have increased. This may also impact longer term contracting opportunities and strategies of these participants. It is unclear how sustained these increases will be and whether it will impact the 2024-2028 period, however given the material increases that have occurred, it is worth consideration by the AEMC. Notwithstanding these increases, SRMC may not be used to inform bidding strategies for all participants. Some participants may adopt a shadow bidding, or alternate strategy, that reduces the importance of SRMC in assessing the appropriate level for the APC.

The APC does remain appropriate to compensate generators during APP's. The APC may influence contract prices, however this impact would be limited to cap pricing and concentrated in near-term prices (i.e. current quarter cap prices). There is minimal impact of the APC in longer dated periods.

The AEMC should assess indexation of the APC, given technology and commodity prices experience inflationary pressures. Any changes to the APC should remain cognisant of how the APC interacts with the contract market.

Question 14: Indexation

- *Are there any specific considerations the Panel should take into account for this review, relating to the indexation of the MPC and CPT?*
- No comment

Question 15: Introduction to the modelling task

- *Do stakeholders consider the high-level modelling approach used by ROAM and EY remain appropriate for the Panel's 2022 RSS review?*

CS Energy acknowledges the complexities of undertaking modelling for the reliability standard and settings. The high-level modelling approach is appropriate, however the following considerations regarding methodology and input assumptions should occur:

- Broad alignment of input assumptions with other NEM-wide modelling undertakings (e.g. AEMO's ESOO and ISP):
 - Alignment of CSIRO technology costs when determining lowest cost new entrant technologies input assumptions;
 - Consistency in demand trace;
 - Unit capability; and
 - Transmission augmentations
- Transparency of environmental certificate revenue (e.g. LGC's) and the influence on bidding strategies of VRE resources;
- Transparency on how demand side response is used, including demonstration these resources can respond in a timely manner and with sufficient scale; and
- Holistic incorporation of constraint equations, including consideration of economic constraints

While CS Energy recognise the intent of modelling both the standard and settings through one modelling process, the AEMC may consider developing a tolerance level for deviations to existing levels of both the standard and settings if this approach is adopted.

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?*

CS Energy agree with the high-level approach proposed, particularly that a single new entrant technology assumption is no longer valid.

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?*

While there are complexities in modelling 5-minute resolution, a true representation of the reliability standard being met may not be provided if a longer resolution is modelled. Specifically, the rate of change capability, particularly of thermal units may not identify periods where the reliability standard is breached. A hybrid approach is to model near-term periods at a 5-minute resolution and longer-term periods at a 30-minute resolution.

One risk that should be captured through sensitivity analysis is a delay to major network augmentations. As the NEM transitions, augmentations will be increasingly important in their impact on reliability, however given the complexity, both technical and financial, of developing these this risk should be considered by the AEMC.