28 November 2022

Submitted electronically: energy.forecasting@aemo.com.au

RE: NEM Reliability Forecasting guideline and methodology consultation

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.

General comments

Shell Energy appreciates the opportunity to provide feedback on the proposed changes to this critical component of the NEM. However, we note that given the scope of the proposed changes to the guidelines and methodology, and the important role played by the guidelines in the market, additional consultation time and additional detail on the proposed changes in the consultation document may have been appropriate. We acknowledge that the consultation duration met the minimum time required under the national electricity rules and whilst we also acknowledge the benefit of the discussion forums with stakeholders conducted in early November, we are concerned that some stakeholders were unaware these forums were occurring and that they were held at times that clashed with other consultation activities which prevented wider participation. For consultations on critical documents such as the ones being consulted on under this consultation process, we support AEMO conducting a series of pre-consultation discussion forums before proceeding with the formal consultation process to allow a more thorough consideration of the items to be consulted on by as wide an audience as possible.

Please see our responses to the consultation questions below. For any questions regarding this submission please contact Peter Wormald (peter.wormald@shellenergy.com.au).

Yours sincerely,

Libby Hawker, GM Regulatory Affairs & Compliance

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[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.

Answers to consultation questions

1. Do you agree that current energy adequacy scenarios and methodologies are inadequate and require modification?

Shell Energy is concerned by the focus in the consultation paper on the very unusual market conditions experienced in June 2022. We note that whilst market operations were stretched, market outcomes did not result in unserved energy in either the electricity or gas markets. In our view the period demonstrated that sufficient powers exist at AEMO and government level to ensure that energy supplies remain reliable even under the most challenging market conditions experienced to date. We are concerned that energy supply reliability is being confused with price related outcomes that occurred due to a range of factors including: the activation of administered pricing periods in both the electricity and gas markets; the market response to administered price caps and market suspension prices that were below the cost of production for many generating units; and the use by AEMO of its market suspension and intervention powers. It is unclear to Shell Energy if the events of June 2022 were in fact an energy supply or an energy pricing issue and we encourage AEMO to examine what the outcomes may have been had more cost reflective administered price caps been in place during this event.

Whilst remaining concerned about this focus on June 2022, incorporating primary and secondary non-hydro fuel limitations into the EAAP is sensible if implemented based on robust assumptions and with scenarios that seek to identify realistic energy supply outcomes.

2. Do the proposed EAAP scenarios improve the breadth and strategic and operational insight on energy adequacy risks in the NEM?

Shell Energy suggests that the first three scenarios should examine the central case, the low rainfall case and the low fuel supply case individually. As proposed, the low non-hydro fuel supply case will also incorporate an additional constraint on energy supply in the form of high rainfall limiting output from hydro generators. We note that whilst the period from November 2020 to winter 2022 has resulted in high rainfall over the various mainland regions, output from the key hydro power stations remained well above average. Over the winter 2022 period in particular, in some months output was close to or at record levels. This does not support a scenario where extended periods of high rainfall impacts both hydro and thermal plant output simultaneously. The scenario as proposed creates a set of standard scenarios that are more conservative than necessary for forecasts applicable to the planning timeframe. Scenario three should be revised to examine low fuel supply with the same rainfall inputs as are applied to the central scenario.

The addition of high rainfall but low hydro output to the low coal and gas fuel supply scenario should be based on observed historical hydro plant output during such periods and should be a sensitivity scenario carried out as a discretionary sensitivity scenario and reported on as such if AEMO considers that it has a material impact on the EAAP.

Shell Energy is also concerned about the lack of clarity provided in the consultation document regarding which scenarios may lead to the declaration of a low reserve condition. It may be appropriate for AEMO to consult with stakeholders on both the scenarios to be modelled and on the outcomes of the modelled scenarios prior to the public release of any draft or final report. Whilst we are supportive of AEMO having the flexibility to develop additional EAAP scenarios for consideration, we do not support these being developed and implemented in isolation by AEMO as proposed in the consultation paper. We recommend that any additional scenarios continued to be developed via consultation with stakeholders. We consider use of the AEMO Forecasting Reference Group formal consultation process for development of additional scenarios would be a suitable framework. This approach would be preferable from a rigorous governance and decision-making perspective and to ensure that the widest range of expertise is applied to understanding energy reliability risks.

It is not clear from the consultation document how the EAAP assessment will be incorporated into the ESOO. We see value in AEMO modelling the EAAP and ESOO separately with the results presented separately in a

single report or the ESOO making reference to the EAAP. However, we think that it would be inappropriate for the EAAP scenarios and assumptions to be incorporated into the ESOO modelling. This approach could incorporate short term fuel supply and plant dynamics into a longer timeframe. This would lead to highly conservative estimates of supply adequacy in the ESOO. In reality market participants will adjust their operations in response to short term fuel supply or plant issues. They will also adjust short and medium term fuel supply and maintenance activities in response to the EAAP and their own views regarding future market requirements. A longer term average approach to plant assumptions should be retained within the ESOO modelling to ensure that short term dynamics do not dominate the ESOO supply adequacy assessment.

3. Are the proposed expanded GELF parameters appropriate for the scenarios and energy adequacy insights proposed?

The proposed expanded GELF parameters appear overly intrusive and onerous for market participants. Contracted fuel supplies and demineralised water storage levels are inappropriate inputs to the EAAP modelling process as they may provide a false level of accuracy based on data at a point in time. Both stored fuel and demineralised water storage levels change frequently in response to plant operations. Provision of this information once a year or even more frequently is of little value and it is questionable whether a model incorporating such levels would provide any additional insights into the energy adequacy of the supply system.

It is also unclear how the EAAP model would benefit from the inclusion of contracted fuel supply information in addition to "most likely" fuel supply information. Contracted fuel supplies also change frequently in response to commercial considerations at various plant. The definition of contracted supply should also be considered. Some contracts include interruptibility or optionality to increase supply. There is also potential to access additional fuel supplies to replace an unforecast use of fuel from stockpiles. If questions are to be asked regarding fuel supplies as well as the "most likely" outcome it must include information regarding the ability to access additional fuel supplies as required for ensuring reliability purposes.

Shell Energy also questions the current methodology in the MT PASA and EAAP modelling regarding allocation of hydro plant water resources. We consider the current methodology which requires hydro storage levels to remain at the same or a greater level at the end compared to the start of each 12 month assessment period is overly conservative and fails to recognise the historically observed fluctuations in hydro storage levels between years. We consider that weekly energy limit data provided by participants should not be adjusted by this additional artificial limit. For similar reasons we do not support the application of artificial modelling limits on the thermal generator fuel supplies.

4. Are there alternative GELF parameters that AEMO should consider that would better achieve the NER and proposed EAAP scenario intent?

Refer to answers provided under Question 3

5. Is the proposed methodology for EAAP and other energy adequacy issues appropriate?

Shell Energy is concerned regarding the lack of detail around the proposal to use GELF parameters within the ESOO modelling rather than the most recent MTPASA run. It is unclear if this would apply only to the first two years of the ESOO modelling, or all years. We would appreciate clarification of this issue.

As noted above, the inclusion of GELF parameters in the ESOO beyond the short term horizon covered by the EAAP assessment for which they are applicable should not be considered. The potential responses of market

participants to short term outcomes must be assumed in the ESOO modelling to ensure that it serves its purpose as a long term supply assessment.

Shell Energy is also concerned by the proposal to add other ISP assumptions to the EAAP process. In particular, consideration of minimum stable loads for thermal generators. This should not be used as a process to force thermal generators out of service based solely on not achieving minimum stable dispatch levels in the modelling run which then results in a reliability shortfall. Where a generator is indicated as available in the MTPASA the EAAP modelling should assume the unit is in-service and operating at or above minimum stable load.

Shell Energy does not support the proposal to amend the MT PASA by adding the use of the weekly energy limit values to the MTPASA LOLP modelling. The LOLP modelling assumes 10% POE outcomes occur on every day in the assessment period. Adding energy adequacy considerations on top of the LOLP assessment will create an extreme worst case scenario that is not reflective of any potential NEM outcome. The proposal fails to consider that flexibility exists in the allocation of energy at dispatch and energy from fuel resources will be allocated to high demand and potential high-priced periods as required to meet consumer demand expectations. Shell Energy questions the value of this modelling of an "all worst-case" parameters basis.

6. Are there any other issues AEMO should consider when assessing energy adequacy?

The recent "Enhancing information on generator availability in MT PASA" rule change allows, as part of the reliability standard implementation guideline, to consider the recall time for which a supply side resource is considered "available" for the various reliability assessment processes. Whilst the consultation paper indicates an intention to retain the current 24 hour value, we recommend a change to extend this to 72 hours (3 days) for the MT PASA and EAAP modelling process. This would better reflect current unit operational parameters in the NEM as well as the observed improvements in the operational forecasting timeframe, (pre-dispatch and ST PASA), and improvements in short term (1 to 4 days) weather forecasting which provides improved forecasts for decision making by participants. The original value of 24 hours was defined at a time when market operations primarily reflected the outcome that a thermal unit was "available" and in-service or not available due to planned or unplanned maintenance activities as well as the lower level of demand and forecasting accuracy at the time.

7. Do you agree that AEMO's current commitment criteria require revision?

Shell Energy agrees that the current commitment criteria for supply side resources, transmission augmentation and proposed large industrial or commercial loads requires revision such that a consistent commitment basis is applied to all projects.

Shell Energy supports the work being undertaken by AEMO and the CEC to provide a more streamlined connection process and minimising delays to project deployment. We would further support AEMO gaining greater understanding of what has driven the observed delays to project reaching full commercial use date (FCUD). In our view it may be unclear if the original date provided by developers represented the date when unit commissioning was expected to commence or the date by which unrestricted dispatch was available. Improved clarity in this area is warranted. Data should be observable by type of project and location including in what stage of the process delays occurred and the reasons for these delays and we encourage this to be incorporated in the reliability forecasting process. We also suggest that developers be required to provide the dates for both expected commencement of commissioning and FCUD with consideration given to partial output from a project during the commissioning stage in the modelling.

Shell Energy is supportive of the standard set of commitment criteria as set out in Table 1 of the consultation paper being applied to supply side resources, transmission augmentation and proposed large industrial or commercial loads.

8. Does AEMO's proposed generation and integrated resource system commitment criteria implementation balance the risks of over or underestimating the required reliability market response?

As observed above it may be helpful to understand the observed project delays at a more granular level. Applying averaged data to the creation of project classification decision criteria is likely to lead to over-estimating delays and over-estimating the required market response.

We note that the committed* criteria requires that the project "fully meet at least four of the above criteria but may only partially meet either the contracts or planning criteria". We recommend that this be amended to "fully meet at least three of the above criteria but may only partially meet two off the finance, contracts or planning criteria and under the finance criteria must have achieved Financial Investment Decision approval". We consider this achieves a more reasonable balance than the currently used decision criteria.

The committed* category is proposed to be omitted from the T-1 period of an RRO reliability assessment which would also see it omitted from the MTPASA and EAAP in the same period. Shell Energy does not consider that this should be the standard approach. It may be appropriate in some circumstances for projects with a high probability of commitment during the T-1 period to include this capacity in the T-1 and other reliability assessment processes. Taking an overly conservative approach and excluding such plant from the T-1 and other reliability assessment processes will result in material costs to market participants and consumers through activation of an RRO reliability instrument and/or long-notice RERT and should be avoided. We recommend that the initial approach should include the project in the various reliability assessment processes based on the FCUD submitted by the developer plus 6 months. On balance we believe any residual risk to reliability is better managed through the short-notice RERT process as the time approaches rather than locking in large costs to consumers well in advance on the basis of conservative modelling assumptions.

We support the proposed project classification decision criteria for Anticipated projects and to include Anticipated projects in all the various reliability assessment processes based on the criteria set out in the consultation paper.

9. Does AEMO's proposed transmission commitment criteria implementation balance the risks of over or underestimating the required reliability market response?

Shell Energy considers that the proposed project classification decision criteria for Committed transmission projects should be based on a project receiving project funding approval from the AER rather than just completion of the RIT-T. This would more closely align transmission projects classification decision criteria with other project types. We also observe that project delays are likely for transmission projects due to their size and complexity and land access issues. We therefore support the commitment criteria for anticipated transmission projects and note that sensitivity analysis on committed project delays may be appropriate.

We do not support the proposal to exclude transmission projects from the MT PASA reliability assessment process and believe a consistent application should apply across the ESOO, EAPP and MT PASA. We note that all these reliability assessments rely on the development and use of the same PASA constraint equations and as such should be able to be implemented at the same time.

10. Does AEMO's proposed application of the commitment criteria to aggregated DER balance the risks of over or under estimating the required reliability market response?

Shell Energy supports applying the commitment criteria to aggregated DER and notes that demand response is to continue to be treated differently to DER. We encourage AEMO to clearly document the distinction between the treatment of DER, aggregated DER and demand response.

11. Are there any other issues AEMO should consider in its commitment criteria and implementation?

Shell Energy notes that large loads (defined as greater than 10 MW) are not currently subject to project classification decision criteria or assessment. We support additional rigour around the modelling of large load commitment and timing. Alignment to generation commitment criteria would appear to be appropriate.

12. Do you agree that AEMO's current outage rate methodology requires revision?

Some revisions may be appropriate. See detail in response to the following question.

13. Does AEMO's proposed generator and integrated resource system outage rate methodology appropriately capture reliability risks?

No. The proposed treatment of scheduled outages, outage extensions, and maintenance outages as a single forced outage input to the modelling requires further consideration. Scheduled outages included in the MT PASA have previously been treated as flexible when assessing system reliability impacts under the EAAP. This has occurred due to the single report EAAP process, and the approach remains appropriate for the EAAP modelling which seeks to identify low reserve conditions. Assuming that a scheduled outage would not be rescheduled in response to a low reserve condition (LRC) absent consultation with the relevant participant is unrealistic. Where EAAP modelling indicates a potential LRC period, AEMO should actively consult with the relevant participant regarding the ability to move the outage dates. Whilst the MT PASA process provides additional information and advanced warning for rescheduling of outages at major plant to ensure that system reliability is maintained in response to PASA capacity and energy limitations, the differences in the EAAP modelling may result in outcomes not indicated in the MT PASA reliability assessment. The adoption of inflexible scheduled outage assumptions in the EAAP will only serve to overstate the potential for unserved energy due to energy limitations and will not reflect realistic outcomes.

Shell Energy understands that it has been proposed that discretionary outage extensions and maintenance outages will be treated as non-discretionary forced outages under the new guidelines. This is inappropriate as adding these categories of outages to the forced outage rate in the model will significantly overstate the unreliability of generating units and therefore the potential for unserved energy. Discretionary maintenance or maintenance extensions or any outage that can be delayed until a more appropriate supply/demand balance period should be modelled differently and separately to non-discretionary forced outages. We also reject the assertion that where an outage extension occurs this is not included in the reliability assessment process. Once the outage extension is included in the MT PASA submission, the reliability assessment is updated to include the impact of this change. To also include this as an increase in the forced outage rate in the model would magnify the true impact of a discretionary outage in the reliability assessment modelling. We also note that AEMO has the discretion to release updates to the MT PASA, ESOO and EAAP reliability assessment reports at any time it considers a material change has occurred.

Shell Energy's view is that these outage types should be modelled in a way that reflects their potential real-world contribution to unserved energy. Generation plant operators seek to undertake discretionary maintenance

predominantly on weekends and other low demand periods and only allow discretionary outages or outage extensions when supply/demand is accommodative. Extension to planned outages are also carefully considered from a supply/demand balance perspective. Financial risk necessitates this approach. Our view is that these real-world operation principles should be reflected in the modelling. This could be done directly by limiting the timing of planned outage extension to align with a planned outage and discretionary outages to time periods with low risk of tight supply/demand. This could align similarly to the treatment of temperature related capacity reductions in the summer period to only the historical high temperature/demand periods in the ESOO and EAAP models. Alternatively, these outage categories could be appropriately discounted by reducing both the capacity impact and probability of occurrence within the model. Whilst not indicated in the consultation paper, if planned outage extensions are to be included, then outcomes where a planned outage returns to service early should also be allowed in the provision of data and allowed for in the model.

For this approach to work AEMO will need to collect data distinguishing between non-discretionary forced, discretionary planned outage extensions and other discretionary or flexible outages. This data is available from plant operators who record their outage data in accordance with international standards.

14. Does AEMO's inter-regional transmission outage rate methodology appropriately capture reliability risks?

Shell Energy maintains that modelling should be as accurate and reflective of real world dynamics as possible to ensure that the best information is available to market participants and all stakeholders. The proposal to only apply single credible contingency and reclassification constraint sets when these would have a material impact on unserved energy appears to disregard this principle. If transmission outages are to be included at all, based on AEMO's assertion of them having low material impact on the forecast reliability gap,[3] it would be more appropriate to model these constraints explicitly at all times. This would be preferable because the transfer capacity of all transmission lines included in the modelling is higher under reclassification as a single credible contingency constraint conditions than it is under forced outage conditions. For example, Heywood would have a 250MW transfer capability under reclassification as a single credible contingency constraint conditions but only 50MW under forced outage conditions. This would have the same impact as an outage of one of the larger scheduled generating units in South Australia and in Shell Energy's view represents a significant impact in the form of a capacity reduction at the times of higher South Australian demand condition. Reclassification of transmission elements in the model as single credible contingency conditions also occur more frequently than a forced outage condition by a significant occurrence multiple. Relying on a single forced outage interconnector transfer capacity assumption to model single credible contingency and reclassification constraint sets will over-state the impact of transmission forced outage constraints on unserved energy. Any prejudgement of the materiality of the impact on modelling results should be avoided.

15. Are there any other outage categories AEMO should consider in its reliability forecasts?

AEMO should consider further improvements to evaluating outages at major loads and incorporating these explicitly into the modelling. This could include questions in the surveys currently undertaken by AEMO with these loads. It is likely that large energy users will increasingly align plant shut downs with high energy prices. In contrast to the discretion exercised by generation operators to target outages at low demand times, owners of high-load facilities would target high demand periods.

[3] Page 20 of the paper

16. Are there any other issues AEMO should consider in its outage rate methodology?

Electricity market stakeholders need to understand the impact of stochastic outage variables on the modelling outcomes. The distribution of results obtained from modelling many different outage scenarios should be individually reported on to highlight the range of expected outcomes and the materiality of outage rate assumptions. In addition, sensitivity analysis should be undertaken on stochastic variables with the impact on unserved energy reported as part of the EAAP.

17. Do the proposed reason codes and recall times appropriately balance market needs for information against the costs and challenges for generators in providing the information?

Shell Energy supported the proposed change and looks forward to further details in this area being provided by AEMO as part of this consultation. We recommend that the long form reason code be replaced with a single alphabetic input code for the purpose of MT PASA submissions.

18. Are there any other issues AEMO should consider when determining the reason codes and recall times?

As set out in our answer to question 6, Shell Energy's view is that, due to improvements in short term forecasting capability, plant with recall times longer than 24 hours should be included in the various reliability assessment processes. It is highly likely that low or lack of reserve conditions will be identified with confidence up to at least 72 hours (3 days) in advance through the ST PASA process or individual participants processes. This timeframe means that system reliability or energy limitation assessments should assume that plant with up to 3 days recall times are available to return to service to contribute to supply reliability.

Shell Energy questions the usefulness of outcomes in the example as set out in Table 6 of the consultation paper. In our view the reported PASA availability should reflect the availability the supply side resource can achieve within the recall period. This aligns with the current PASA availability definition. The reason code would be used in this case to reflect the forecast unit state to determine its inclusion or otherwise in the reliability assessment. The current proposal would see AEMO assume that a unit could return to full capability within the recall time which may not accurately represent forecast unit capability.

19. Do you agree that the reliability gap methodology requires revision?

Shell Energy agrees that the current methodology requires some level of revision but does not currently support all the proposed changes to the reliability gap calculation methodology.

We do not support the proposed change to move away from the current LOLP thresholds methodology in identifying the reliability gap period. We believe the issue as identified by AEMO would be better addressed by calculating the reliability gap based on the size of the additional supply or demand side resource required to reduce forecast unserved energy below either the interim reliability measure or the reliability standard applied to all periods within the applicable assessment year. The current calculation which prevents the additional supply or demand side resource reducing forecast USE outside the defined reliability gap period results in overstating the size of the additional supply or demand side resource and acts to extend the duration of any forecast reliability gap period.

We therefore support the proposal set out as proposed change 1 in the consultation paper to apply the additional supply or demand side resource required to reduce forecast unserved energy below either the interim reliability measure or the reliability standard applied to all periods within the applicable assessment year. It should be noted that this issue was identified as a flaw in submissions during the initial development of this methodology.

Shell Energy requests that AEMO provide the results of additional modelling which implements this proposed change to better understand its impact before considering the changes detailed as proposed change 2. AEMO should then allow further consultation in this area prior to AEMO preparation and release of its draft determination and report for this consultation.

We consider that the current requirement set out in proposed change 2 to require the reliability gap period to capture a minimum of 90% of all forecast USE periods to be overly conservative. We do not believe that such a threshold if applied should exceed 70% of all forecast USE periods. Looking at published outcomes indicated in the current MT PASA reliability assessment forecast as a guide to future outcomes, based on this data, then AEMO could declare a reliability gap period in some regions for extended periods.

Shell Energy also requests further details of what is actually proposed under proposed change 2(c). We would not support a change that extended the declared reliability gap period simply on the basis that this could be covered by a standard traded contract.

20. Does the proposed methodology for calculating the likely trading intervals of the reliability gap period, and reliability gaps in megawatts appropriately meet the requirements of the NEL and NER while not unduly increasing costs for retailers?

We consider that the changes as proposed whilst meeting the NEL and NER are overly conservative in some areas. We consider that the NER and NEL requirements could be achieved by implementing proposed change 1 and are not convinced that the changes set out as proposed change 2 are required. The proposed change to the methodology if fully implemented may materially increase costs for retailers with flow on impacts to consumers by extending the duration of a reliability gap period without materially impacting the forecast level of USE.

21. Are there any other issues AEMO should consider in its reliability gap methodology?

Due to the minimal timeframe allocated to Stage 1 of this consultation and the level of detail contained in the various methodologies, guidelines and process descriptions covered by this consultation paper, we encourage AEMO to consider conducting additional workshops to allow further feedback on matters not directly raised prior to finalising the draft determination and report.