ERM Power Limited
Level 3, 90 Collins Street
Melbourne VIC 3000

ABN 28 122 259 223

+61 3 9214 9333
ermpower.com.au

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Australian Energy Market Operator
Level 22, 530 Collins Street
Melbourne VIC 3000

RE: Reliability Forecasting Methodology Issues Paper

ERM Power Limited (ERM Power) welcomes the opportunity to respond to the Australian Energy Market Operator (AEMO)'s Reliability Forecasting Methodology Issues Paper, which consults on approaches to calculating the reliability forecasts to be used as inputs in identifying material reliability gaps under the Retailer Reliability Obligation (RRO).

About ERM Power

ERM Power is an Australian energy company operating electricity sales, generation and energy solutions businesses. The Company has grown to become the second largest electricity provider to commercial businesses and industrials in Australia by load[1], with operations in every state and the Australian Capital Territory. A growing range of energy solutions products and services are being delivered, including lighting and energy efficiency software and data analytics, to the Company's existing and new customer base. The Company operates 662 megawatts of low emission, gas-fired peaking power stations in Western Australia and Queensland. www.ermpower.com.au

General comments

ERM Power welcomes the opportunity to respond to the proposed inputs and methodology for modelling reliability forecasts in the National Electricity Market (NEM). The NEM is currently exposed to significant changes in technological and regulatory settings, including the effective implementation of the RRO from 1 July 2019.

The RRO will place obligations on liable entities to hold contracts for a defined amount of supply based upon a forecast shortfall in reliability. The forecast shortfall will be determined against the reliability standard of 0.002% unserved energy (USE). It is critical for the fair operation of the market that the determination of the assumptions and methodology underpinning reliability forecasting is transparent, comprehensive and rigorous.

ERM Power believe that AEMO is intending to apply an excessively conservative approach to forecasting USE in the 2019 Electricity Statement of Opportunities (ESOO) which is not supported by an evidence-based justification. We believe the proposed methodology in the Issues Paper to forecasting USE for the definition of a material reliability gap does not align with the policy objective of the RRO.

ERM Power is concerned that the proposed methods contain multiple and compounding conservative assumptions, discussed in our submission, which will impact the functioning of the reliability instrument and the duration of a material reliability gap. ERM Power believes that AEMO is employing an aggressive approach to forecasting demand, while applying conservative expectations of availability of supply. As a result, it is expected that the reliability instrument will be declared more frequently, and reliability gap periods will be defined by greater MW values, extend for longer time periods and cover a larger number of trading intervals than previously assumed.

[1] Based on ERM Power analysis of latest published financial information.

This places additional risk on liable entities. The contracting requirements of the RRO will directly link AEMO's forecasting accuracy with the commercial arrangements of individual liable entities. Liable entities will seek to avoid not meeting their forecast demand, as they face large penalties in the event their own forecasts prove to be incorrect.

In our view, this undermines the RRO's policy objectives to encourage reliable supply and reduce energy costs. This is an undesirable market outcome. The consequences of AEMO's conservative forecasting approach will be unnecessary costs on the market and ultimately, increased costs for consumers.

The impact of increased costs on consumers is an unacceptable consequence of AEMO's approach to reliability forecasting. As such, we provide detailed discussion on modelling specifications outlined in the Issues Paper and provide recommendations for improvements and consideration.

Demand

Consumption and demand forecasts in the reliability forecast

ERM Power is concerned about the progressive development and interpretation of the definition of a reliability gap trigger. AEMO's Issues Paper states that for the T-3 and T-1 triggers in the reliability forecast, expected USE will be assessed based on the weighted outcomes of the market simulations of the different operational sent out POE demands (10%, 50% and 90%). The Issues Paper also states that for the purpose of the RRO, AEMO will use its 50% POE operational forecast as the 1-in-2 year peak demand forecast. AEMO has provided their view to the Forecasting Reference Group that this 1-in-2 year demand forecast (at 50% POE) would relate solely to the calculation of compliance with the RRO, and the calculation of penalties or Procurer Of Last Resort (POLR) payments. Importantly, the definition of a reliability gap trigger is not restricted to the one-in-two year peak demand forecast with 50% POE. Therefore, AEMO is proposing to adopt two inconsistent methodologies for determining a reliability gap trigger event and calculating the compliance of liable contracts against the material reliability gap. This represents a deviation from how it has been assumed the reliability trigger would operate.

ERM Power is concerned with this deviation of approach in respect to the RRO trigger. The potential impact is that the determination of reliability gap periods and triggering of the obligation can be declared on the projection of USE levels which are based on much higher demand forecasts than previously expected, including the one-in-ten year peak demand forecast. The outcome of this is an increased likelihood of a reliability gap period being called during periods of lower probability of an USE event. It is reasonable to assume that this will result in liable entities opting to contract at T-3 to T-1 while the Market Liquidity Obligation is operational. This creates increased risk to liable entities, which is likely to result in increased costs to the market. This outcome should be avoided. ERM Power recommends that a 50% POE demand forecast should be used as a more appropriate estimate of a reasonable probability of occurrence.

ERM Power believes clarity is required regarding the selection of reference year demand traces. It would be beneficial for AEMO to provide further clarity and justification for the methodology used for the demand trace scaling, and the application of scaling of benign reference years. In particular, the methodology of scaling reference years of lower and relatively flatter maximum daily demand outcomes, compared to the typically peaky demand profiles of higher demand years. This is necessary as the application of scaling of benign reference years has the potential to result in increased days of very high to extreme demand outcomes than what is reasonably warranted. ERM Power is concerned about the impact of scaling days of a benign season, as this would generally overstate the number of high demand points for a reference year. The impact of this is to overestimate the number of days close to the maximum demand. ERM Power requests that AEMO consider alternatives to scaling benign seasonal days. We suggest a potential alternative to be to apply a "pattern" approach to scaling of benign years. This approach could allow AEMO to develop a scaling "pattern", which is developed from outcomes between the top ten observed demand points during very high peak demand years. This could subsequently be applied to benign years.

The reporting of actual demand outcomes compared to forecasts forms an integral part of the RRO to ensure forecast outcomes are reasonably aligned with outcomes which actually occur. Although the forecasting accuracy report has included improvements in the 2018 publication, the current forecasting accuracy report has areas which require additional detail. We recommend that consultation on the format and detail of the Demand Forecasting Accuracy Report be undertaken to improve its ability to meet the obligations of the RRO requirements.

AEMO are currently expected to issue the 2019 regional peak demand forecasts in early June. ERM Power will provide comments on AEMO's demand forecasts with the release of this publication.

Loss of Load Probability

AEMO has proposed to undertake LOLP calculations as a basis of defining the length of a reliability gap. When a material reliability gap is declared, the LOLP calculations are also intended to identify the relevant trading intervals within the gap period.

The LOLP calculation is proposed to be based on the outcomes of USE calculation model, which includes 10% POE forecasts. The outcome of this is that to determine the length and trading intervals of a reliability gap, AEMO will apply thresholds of 2% or 5% to the LOLP calculation. ERM Power are concerned about this outcome, due to indications from AEMO that the threshold selection of 2% or 5% is not supported by a statistical basis. We believe that rigour is required in forecasting approaches, and recommend a statistically-based alternative be used as the basis of identifying reliability gap length and the associated trading intervals. ERM Power recommends an alternative approach to the calculation of Loss of Load Probability (LOLP) as detailed in the Issues Paper. We will provide detail on a proposed alternative approach further in our discussion.

Demand-side participation

The consideration of demand-side participation (DSP) has the potential to significantly impact forecasting outcomes. ERM Power believes that it is important that assumptions underpinning DSP inputs are supported by evidence. In this regard, ERM Power believes there are assumptions and approaches to DSP in modelled forecasts which require further clarity and justification.

ERM Power requests further clarity on AEMO's approach to estimating DSP behavior given AEMO has opted to apply a 50-percentile threshold to their estimate of observed historical DSP behaviour. ERM Power believes this represents a conservative estimate of participant behaviour, and requests further detail on the rationale underpinning this approach. We also request that AEMO provide additional details regarding the aggregate values of DSP lodged by participants to AEMO's demand side participation portal. We seek an explanation on the method employed by AEMO to integrate these values into AEMO's DSP assumption.

The forecast modelling of energy efficiency utilisation also assumes that customer utilisation of energy efficiency will be lower on extreme temperature days than normally expected. Supporting evidence has not been provided for this assumption. We recommend that AEMO undertake work to document evidence of energy use behaviour to support this approach. If evidence cannot be documented, we recommend reconsideration of this assumption.

AEMO has applied an assumption that DSP will be comprehensively included in qualifying contracts under the RRO, and has consequently not included DSP against the 50% POE demand traces. ERM Power questions this assumption and considers that it should only be used if it can be supported by reasonable evidence.

ERM Power believes that further work is required to adequately model DSP within the reliability forecasts. We believe that insufficient analysis has been undertaken on proposed demand response rule changes currently under consideration, and recommend that further work be undertaken to assess the potential impact of known regulatory processes on demand response on forecast outcomes. ERM Power also requests clarity on the allocation of DSP as determined by modelled price outcomes, and the methodology used to populate generator bids from which the modelled price outcomes would be derived.

Distributed energy resources

ERM Power believes that the detail of modelled distributed energy resources as identified in the Issues Paper is generally reasonable, and requests clarification of certain specifics. We recommend further improvements. We note that AEMO has assumed that Virtual Power Plants (VPP) will be used by liable entities within qualifying contracts. We request that additional consultation is undertaken before applying this assumption.

We hold the view that the assessment of household rooftop solar PV is reasonable, but consider AEMO's process would benefit from clarification regarding the assessment methodology for larger C&I-based systems (100kW to 5MW). The Issues Paper does not provide adequate clarity on the methodology applied to distributed battery storage, specifically the battery discharge capacity and storage capability on high demand days. ERM Power requests that consideration of the assumptions regarding battery discharging at system peak demand times be further detailed for stakeholder consultation.

Due to the complexity of inputs and assumptions regarding distributed energy resources modelling, AEMO has engaged two consultants to provide analysis, with significantly different forecast projections of distributed energy resources provided. Stakeholders would benefit from understanding the process and assumptions which will determine the reconciliation of these significantly different forecast outcomes, to determine a final modelled output for distributed energy resources.

ERM Power believes it is important for improved understanding of the impact of network tariffs on distributed energy resources in AEMO's reliability modelling. Consideration of the impact of changing network tariffs, such as time-of-use (TOU) tariffs, appears minimal. ERM Power recommends that further work be undertaken to understand the potential impact of network tariffs on distributed energy resources. In particular, the current assumption is that charging of storage systems will primarily occur via rooftop solar PV. We recommend that AEMO consider the impact of low off-peak tariffs and peak tariffs on Energy Storage System charging and discharging.

Generation and storage

Generation and storage modelling in the reliability forecast

ERM Power recommends that further clarity is required regarding grid scale battery charging and discharging patterns during high demand days, particularly when a battery is not storing energy during higher but not the daily maximum demand periods.

New entrant generation

ERM Power is concerned with AEMO's proposal to exclude Com* projects (projects which may not have finalised connection agreements or generator performance standards (GPS) but have commenced construction) from the 2019 ESOO and future reliability forecasts. This is likely to lead to an increased frequency of a reliability gap trigger, as it does not consider generation currently under construction which is highly likely to provide additional capacity to the market. ERM Power does not believe that there is sufficient evidence in the NEM of instances of failures to finalise connection agreements or GPS negotiations for plant under construction to warrant an exclusion of this variable and therefore we see a greater likelihood of unwarranted identification of reliability shortfall and subsequent over-contracting of capacity.

ERM Power suggests that a potential option for AEMO would be the consideration of additional criteria in their generator status methodology, which includes Com* projects on the provision that completion is expected within the T-3 period. AEMO could potentially also include an additional "advanced" project category status where construction has commenced and completion is expected within the T-3 period. It is also important that AEMO considers the inclusion of generator status methodology through the Reliability Standards Implementation Guideline to allow for consultation and formalisation of the process.

Generator capacity

In relation to the MTPASA and ESOO, AEMO has indicated an intention to amend the summer reference temperature for their assessment of generator bids and forced outage rates. ERM Power considers this a deviation from the current MTPASA and ESOO process, with the potential to result in modelled outcomes where normal temperature de-rating from registered capacity is deemed as a forced outage. This modelled result will occur, irrespective of the fact that generators will have temperature de-rated plant availabilities submitted through the ESOO process. We request further clarity on the justification underpinning this deviation to assess the validity of this shift in approach.

We are concerned about the proposal to limit the use of forced outage data to a three-year sample and on a yearly input basis. There is the potential that if a High-impact Low-probability (HILP) event is present within the three-year period used in the modelling, it would significantly bias the modelled results. As such, ERM Power recommends the use of a ten-year long-term average input, with the inclusion of HILP events on an annualised basis.

ERM Power rejects the proposal to use single year forced outage data in the modelling. We do not believe AEMO has provided an evidence-based justification for this approach. The inclusion of a single year forced outage rate represents an artificial adjustment of the data, which will incorrectly bias the modelled outcome. The modelled variability of forced outage rates should be statistically-based variability, and not user-selected values. The impact of this is to potentially overestimate USE beyond the statistical expectations.

ERM Power is concerned AEMO is applying conservative assumptions to the modelling of de-rated plant capability. We believe that summer reference year temperature values have been defined conservatively. Realistically, few days will reach the reference temperatures and overnight plant capacity will be much higher. Currently, demand and VRE traces are aligned based on historical weather conditions, including maximum temperature outcomes. As an alternative to the current continuous temperature de-rating of generating units for the summer period, we recommend a simple step change relationship be employed in the modelling. The relationship could be defined by using registered capacity below a defined temperature, while using summer reference temperature deratings above a certain temperature matched to the historical temperature outcomes from the selected reference years.

The Issues Paper also considering the impact of non-discretionary maintenance outages, and their inclusion in the modelling forecasts as a potential increased risk of USE. The combination of these modelling approaches has the likely impact of conservatively forecasting USE and creating unnecessary over-contracting requirements for liable parties which will likely result in higher costs to consumers. ERM Power emphasises that the inclusion of outages should be limited to forced outages which can be directly attributed to temperature conditions, and exclude outages related to normal ambient temperature de-ratings. Forced outages and breakdown maintenance outages have clear, internationally-used definitions. ERM Power requests AEMO do not seek to deviate from these definitions for modelling purposes. We also seek clarification on whether a weighting is being applied to align forced outages at times of high demand in the modelling.

There is some discrepancy identified regarding information availability in the MTPASA and the ESOO. It is unclear whether the MTPASA and STPASA bids are correctly referenced. ERM Power requests additional detail in this area prior to further modelling development.

Transmission network

Network outages

ERM Power requests clarity regarding the data inputs used in network outages. There is the potential for over-forecasting of forced transmission outages at times of peak demand. This potential can be realised through the inclusion of outages in the historical data that, although unplanned, were undertaken on a delayed maintenance basis, rather than a forced outage. We seek understanding on AEMO's approach to managing this specification within the modelling exercise.

Declaring a reliability gap

Reliability gap period and likely trading intervals

The Issues Paper states that for a T-3 reliability instrument, the approach for determining the reliability gap period and likely trading intervals will be necessarily conservative to reflect the greater uncertainty around the timing of the possible USE events. ERM Power sees this overly conservative approach will lead to inefficient contracting and will ultimately come at a cost to consumers. We therefore do not believe this overly conservative approach is warranted.

As previously discussed, the threshold levels of 2% and 5% utilised within the LOLP calculation are not based on a statistical justification. ERM Power proposes an alternative statistically-based approach for the calculation of the LOLP threshold. We suggest that when a forecast USE exceeds the reliability standard, the model should be re-run, with the same input assumptions including a new input of sufficient additional firm generation to return a forecast average USE to within the reliability standard. Based on this model re-run, we suggest that where forecast LOLP aligns to USE that met the reliability standard, AEMO could calculate the resultant percentage of USE trading intervals present that would occur where the reliability standard is met. It is this percentage threshold that could then be applied to calculate those periods in the original USE modelling where any reliability gap applied.

The difference in LOLP between the two modelled scenarios, where the reliability standard is either met or otherwise, could be used to determine the reliability gap period, in terms of months and trading intervals. It also provides the ability to accurately calculate the MW reliability gap, as the MW of additional firm capacity required to return forecast average USE to the reliability standard most accurately reflects the size of the reliability gap.

Size of the reliability gap

Determination of the size of the reliability gap has critical implications for the procurement of reserves under the POLR provisions and the allocation of certain RERT costs recovered from POLR liable entities as POLR debts. AEMO has stated that in their view that the size of the reliability gap should be determined based on the effective response that additional reserves could provide, if only applied in the modelling to cover the reliability gap period and those gap trading intervals selected for inclusion, rather than being allowed to apply to all periods and trading intervals in the modelling where forecast USE would be reduced by their use. We understand this will be determined for each region separately, based on the effect of additional capacity in the reliability gap period on USE in each selected gap trading interval.

ERM Power opposes this approach and is concerned regarding the potential for this approach to artificially increase the size of the material reliability gap by limiting application of additional reserves only to the reliability gap period and those selected gap trading intervals. The methodology implies that additional reserves would not be available to reduce forecast USE more generally. As the purpose of the reliability forecast is to determine if forecast USE exceeds the reliability standard, we believe a reduction in forecast USE in any trading interval would meet the objective to reduce forecast USE below the reliability standard. As such, exclusion of additional reserves from any trading interval from the modelling to meet this objective is not warranted.

Feedback

AEMO has provided indications that due to the timeliness of the consultation on reliability forecasting, stakeholder views provided throughout this consultation process may not be incorporated into the 2019 publication of the ESOO. ERM Power believe that this does not align with the objective of effective consultation in accordance with the RRO consultation process. ERM Power requests AEMO consider the delay of the issues of the reliability forecast component of the ESOO until the matters raised during this stakeholder engagement process have been considered.

Conclusion

Reliability forecasting is a critical undertaking for system planning and market operation. ERM Power welcomes the opportunity to engage in the direction of reliability forecasting. However, we are concerned that the multiple conservative approaches detailed in the Issues Paper will increase the length and magnitude of an identified material reliability gap under the RRO. We believe this does not align with the policy objective of the RRO, and ultimately places unjustified increased costs on consumers.

Please contact Ron Logan (rlogan@ermpower.com.au, 0427 002 956) or Emma White (ewhite@ermpower.com.au, 0438 482 147) if you would like to discuss this submission further.

Yours sincerely

Michelle Barry
EGM Corporate Affairs

mbarry@ermpower.com.au – (07) 3020 5145