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RE: Forecasting Accuracy Report Methodology Consultation

ERM Power Limited (ERM Power) welcomes the opportunity to respond to the Australian Energy Market Operator's (AEMO) consultation on AEMO's Forecasting Accuracy Report Methodology.

About ERM Power

ERM Power (ERM) is a subsidiary of Shell Energy Australia Pty Ltd (Shell Energy). ERM is one of Australia's leading commercial and industrial electricity retailers, providing large businesses with end to end energy management, from electricity retailing to integrated solutions that improve energy productivity. Market-leading customer satisfaction has fuelled ERM Power's growth, and today the Company is the second largest electricity provider to commercial businesses and industrials in Australia by load[1]. ERM also operates 662 megawatts of low emission, gas-fired peaking power stations in Western Australia and Queensland, supporting the industry's transition to renewables.

http://www.ermpower.com.au
https://www.shell.com.au/business-customers/shell-energy-australia.html

Whilst generally supportive of the Draft Forecasting Accuracy Report Methodology, ERM Power offers the following comments with regards to some specific areas of the draft methodology.

Section 2 – Adjusting demand

ERM supports the adjustments proposed to adjust "metered demand" to "actual demand" as set out in the draft methodology. Whilst generally supportive of a methodology to adjust "actual demand" to "adjusted demand", we do have some concerns with regards to the proposed methodology and seek further clarification in the following areas.

Adjustments for price responsive demand side participation

We acknowledge that the proposed methodology would be suitable for a steady load of reasonable size where demand side response could be accurately verified. However, for load types which are highly variable in nature and below a size threshold where accurate measurement would be hard to verify, we believe the proposed methodology would not be suitable. We recommend that AEMO define a minimum load size and an acceptable baseline accuracy threshold in the methodology below which adjustments would not be made.

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

Network reliability programs estimated demand side participation

Where AEMO uses estimated values provided by network service providers (NSP) for demand side participation provided under NSP's network reliability programs, it is unclear as to the verification process that applies to the NSPs in determining these estimated values. Is the data based on NSP individual feeder data, or metered consumption verification? We recommend that the methodology set out a verification process to be applied by NSP's and AEMO for the provision of this estimated data.

Distribution network failure load shedding

We note that the methodology stipulates that any adjustment for distribution network failure load shedding must require a minimum threshold of 20,000 individual customers be affected. However, the example provided in Table 1 in the methodology indicates adjustments made for half hour trading intervals where less than 20,000 customers were impacted. We recommend that the example table be amended such that it is clear that for any half hour trading intervals where less than 20,000 customers were impacted, the adjustment value is zero.

We also note that the methodology indicates that, "AEMO seeks to get an estimate of customers without power for the relevant period from the relevant NSP, or an estimate of the impact in MW directly if available." However, the methodology fails to set out the process by which the NSP is required to compile and verify their estimates. We recommend that the methodology set out a verification process to be applied by NSPs for the provision of this estimated data.

Lastly AEMO indicates that, "If AEMO only can get an estimate of customers not supplied, this is translated into a MW impact using an assumed diversified customer demand of 2 kW per customer, which reasonably reflects average customer load at time of maximum demand conditions." The methodology however contains no details as to how the assumed diversified customer demand of 2 kW per customer was derived by AEMO. Was this based on historical distribution network feeder or individual customer metered load data obtained from historical distribution network failure events or was it based on other AEMO modelling input assumptions? We recommend that the methodology set out how the assumed diversified customer demand value in kW per customer is derived.

Voluntary load reductions

The methodology sets out details of AEMO's demand reduction calculator (DRC) tool. This tool assesses the impact on demand for a mandated or voluntary reduction in use of different domestic appliance types and is based on an estimated daily load usage profiles per included appliance type for each NEM region. The appliances expected to be consuming during peak demand periods in the DRC tool are set out in Table 2 contained in the methodology. The DRC tool explicitly assumes that consumption by the listed appliances would, (absent a Jurisdiction implementing requests for voluntary or mandatory load curtailment), "normally" occur at a time of high regional system demand. This assumption aligns this consumption with the peak demand periods of the day where consumption by these appliances could be subject to peak time of use pricing or peak demand network tariff baselines.

ERM Power questions the inclusion of pool pumps, washing machines, clothes dryers and dishwashers in the DRC tool as appliances that would "normally" be expected to be consuming during the peak demand periods.

ERM Power also notes the inclusion in the methodology of potential voluntary load reduction during extreme peak demand days generally associated with temperature extremes due to voluntary adjustment of air conditioner controlling set point temperature. We agree with AEMO that air conditioning cooling load is "the key driver behind the peak demand days in summer".

However, any potential load reduction requires that: 1) the air conditioner is in use at time of peak system demand; 2) consumers normally have a reasonably low temperature set point on air conditioners; and 3) that the air conditioner is physically capable of maintaining a low temperature outcome at a time of very high ambient temperature.

We contend that current electricity cost pressures may have already impacted consumers decisions with regards to air conditioning operation including room temperature control settings and temperature set points may be higher than that of only a few years ago. There is also a reasonable probability that on very high temperature days a large number of air conditioners may continue to operate at full power consumption even if the temperature setting were to be increased by 3 degrees Celsius from a lower temperature setting. It is also unclear if AEMO's model assumes that consumers would continue to operate air conditioners during periods where a residence is unoccupied, if this is the case then we question this assumption as a consumer would be incurring costs for no benefit.

We consider that additional analysis is required in the area of adjustments to demand outcomes for potential voluntary load reductions before including such adjustments in the methodology.

We recommend that the methodology require that the process for adjustment from "metered demand" to "adjusted demand" is subject to clearly documented processes for both AEMO and NSP's, values derived are able to be independently verified and any adjustment be transparently reported.

Section 5 – Demand forecasts

We agree with AEMO's view that measuring the accuracy of maximum demand forecast methodology based on a single summer and winter day maximum yearly demand outcome is challenging. Currently, in the demand forecasting process AEMO creates 1,000 simulation years of potential demand outcomes on a half hourly basis using base data and flexing demand profiles using simulated temperature inputs from which the summer and winter 10, 50 and 90% possibility of exceedance (POE) maximum demand forecasts are derived. We believe the use of one summer and one winters day actual maximum demand outcome which is then compared to AEMO demand forecasting model adds little value in determining the veracity of AEMO's model.

We recommend that AEMO extract from their modelling outputs the 1, 10, 50, 90 and 99% POE forecasts on at least a monthly basis and compare these to the actual monthly outcomes for both the day of working weekday maximum demand, cross-checked with the maximum daily demand outcome on the day of maximum (for summer months) or minimum (for winter months), working weekday daily maximum temperature outcomes. This would allow the accuracy of the model to be considered over a range of potential future scenarios, as opposed to the current summer and winter single day accuracy measurements.

We are also concerned that AEMO forecasting process may include a degree of recency bias, where outcomes in the current year can result in significant adjustments to the model. In our view there may also be a degree of central planner/market operator conservative bias that reduces the likelihood of the 10% POE forecast being exceeded. As noted by the Brattle Group "*system operators and policy-makers may have a bias towards delivering additional reliability, for example because these institutions do not themselves bear the costs of purchasing additional reserves*"[2], in this case the bias for additional reliability takes the form of conservative demand forecasts which then flows through to decisions for reserve procurement. We contend that actual demand outcomes, which exceed AEMO's 10% POE demand forecasts, but which remain within the range of modelled outcomes, is a natural outcome of a probabilistic model.

[2] Page iv Brattle Group report to AEMC High-Impact, Low-Probability Events and the Framework for Reliability in the NEM

On 13 February 2019, the Queensland region set a new record operational maximum demand of 10,044 MW on a day of unusual state-wide weather conditions. The observed maximum demand came after three consecutive state-wide hot days, on a weekday, and outside the school holiday season. As acknowledge in the 2019 Forecasting Accuracy Report, "*The combination of these factors rarely happens and generally leads to outcomes in the high end of the forecast distribution*".[3]

On 13 March 2019, the Queensland region experienced hotter temperature outcomes at the regional reference weather station, but not on such a widespread state-wide basis and these weather conditions aligned with more normally experienced summer weather patterns. On that day maximum demand outcomes were some 680 MW lower. When the 2019 Electricity Statement of Opportunities was released, the Qld 10% POE operational maximum demand forecast for the summer of 2019/20 increased by 470 MW to 10,236 MW.

We believe this increase in demand forecast would have been influenced to some degree by the modelling biases as discussed above. In considering the maximum demand outcome on 13 February 2019, based on available reports, it is unclear if AEMO considered the full range of forecast maximum demand outcomes from the 2018 ESOO modelling process. If the actual outcome fell within the range of potential outcomes, albeit above the 10% POE value from the model, then the model accurately predicted the potential for such an outcome to occur. Such a significant adjustment to the model to that observed would be warranted only if the model had failed to predict such an outcome.

We also believe the methodology would be improved by the inclusion of forecast vs actual weather diversity analysis. Weather diversity is a measure of the alignment of regional maximum demands with overall whole of NEM maximum demand. Historically, the higher the actual regional demand outcomes, the higher the level of observed weather diversity. Conversely, for lower actual regional demand outcomes, the lower the level of weather diversity between regions. AEMO's use of scaling of historical demand traces to AEMO's forecasts of 10 and 50% POE demand forecasts for use in in the various reliability modelling processes could result in outcomes where modelled weather diversity at the time of individual region or whole of NEM maximum demand outcomes is lower than that historically observed at times of very high regional demand outcomes resulting in a "modelled illusion" of a potential reliability gap where at dispatch a reliability gap would not manifest.

Section 6 – Supply forecasts

<u>Demand side participation</u>

We are supportive of the observation methodology proposed for demand side participation (DSP) but remained concerned by the low values used by AEMO in their supply forecasts compared to the level of DSP observed by participants at times of high prices in the market. We understand that where a potential demand side participant has registered to be part of the short notice Reliability and Emergency Reserve Trader (RERT) Panel, but has not been awarded a short-notice RERT contract, that any observed price responsive demand side participation is excluded from AEMO's determination of actual or future DSP resources.

We disagree with the decision criteria as it fails to acknowledge that DSP not subject to an awarded RERT contract remains free to participate for in-market demand side response and assumes that awarding of RERT contracts will be explicitly required in the future. This in effect introduces a circular outcome that by excluding this price responsive load from the reliability assessment, a resulting reliability gap is artificially manufactured which then determines ongoing RERT procurement is required. Only where a DSP resource has been awarded a RERT contract should this resource be considered as an out-of-market resource from a reliability assessment perspective and only for the duration for which the RERT contract applies. This will be of particular concern going forward following implementation of the proposed wholesale demand response mechanism which will provide additional economic incentives for in-market DSP.

[3] Page 38 AEMO 2019 Forecasting Accuracy Report

Generating resources supply availability

We support the proposed methodology to monitor and record the availability of supply side resources as set out in the Methodology document. We recommend that actual to forecast comparison data be presented on a regional basis separately for both scheduled and semi-scheduled generating resources. Whilst AEMO has historically tended to provide this data based on specific scheduled generation fuel input type we believe there would be benefit in reporting outcomes on a regional scheduled and semi-scheduled basis as well.

We note that the forecast and actual outcomes are based on the top 10 summer demand days. Given the large diversity of demand outcomes which may occur across the top 10 summer days and that milder summer conditions have and will potentially occur again, at times the economic commitment of some gas fired generation from a bid “maximum availability” perspective may not be warranted. In this case bid “short term projected assessment of system adequacy or bid “PASA availability” should be substituted for “maximum availability” in the supply availability assessment for those analysis periods.

We understand that AEMO truncates the forecast supply side availability curves to “*eliminate outliers that may occur with very low probabilities*.” However, in displaying actual outcomes, AEMO continues to include these very low probability outcomes which in our view results in a degree of assessment bias. We recommend that this assessment and graphical representation include the full range of potential outcomes from AEMO supply availability assessment modelling.

Please contact me if you would like to discuss this submission further.

Yours sincerely

[signed]

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