Draft Report

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Explanatory statement and consultation notice

This draft paper commences the second stage of the consultation procedure conducted by AEMO to review the Forecasting Accuracy Report Methodology (**the Methodology**). As per the Australian Energy Regulator's (AER's) Forecasting Best Practice Guidelines (FBPG)[1], when reviewing its Forecasting Approach, which includes the Methodology, AEMO is required to consult at least every four years using the consultation procedures in Appendix A of the FBPG. This includes a formal written consultation process, including two rounds of written submissions.

A draft update to the Methodology has been released with this draft determination.

Consultation notice

AEMO is now consulting on this draft report and invites written submissions from interested persons on the issues identified in this paper to energy.forecasting@aemo.com.au by **5:00 pm (Melbourne time) on 22 July 2024.**

Submissions may make alternative or additional proposals you consider may better meet the national electricity objective in section 7 of the National Electricity Law (NEL). Please include supporting reasons.

Before making a submission, please read and take note of AEMO's consultation submission guidelines, which can be found at https://aemo.com.au/consultations. Subject to those guidelines, submissions will be published on AEMO's website.

Please identify any parts of your submission that you wish to remain confidential, and explain why. AEMO may still publish that information if it does not consider it to be confidential, but will consult with you before doing so. Material identified as confidential may be given less weight in the decision-making process than material that is published.

AEMO is not obliged to consider submissions received after the closing date and time. While exceptional circumstances may enable consideration, any late submissions should explain the reason for lateness and the detriment to you if AEMO does not consider your submission.

Interested persons can request a meeting with AEMO to discuss any particularly complex, sensitive or confidential matters relating to the proposal. Meeting requests must be received by the end of the submission period and include reasons for the request. We will try to accommodate reasonable meeting requests but, where appropriate, we may hold joint meetings with other stakeholders or convene a meeting with a broader industry group. Subject to confidentiality restrictions, AEMO will publish a summary of matters discussed at stakeholder meetings.

[1] At https://www.aer.gov.au/system/files/AER%20-%20Forecasting%20best%20practice%20guidelines%20-%2025%20August%202020.pdf.

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1. Stakeholder consultation process

AEMO must maintain its Forecast Accuracy Report Methodology (**the Methodology**) in accordance with the Australian Energy Regulator's (AER's) Forecasting Best Practice Guidelines (FBPG)[1]. The FBPG require AEMO to consult on the Methodology at least once every four years using the two stage consultation procedures in Appendix A of the FBPG. Any revisions must be consulted on consistent with AEMO's Reliability Forecast Guidelines[2].

This paper completes the Draft determination and commences Stage 2 of AEMO's consultation to review the Methodology.

Note that this document uses terms defined in the National Electricity Rules (NER), which are intended to have the same meanings.

AEMO's indicative process and timeline for this consultation are outlined below. Future dates may be adjusted and additional steps may be included if necessary, as the consultation progresses. In the event that these dates change, AEMO will clearly identify the timetable on the webpage for this consultation[3].

Consultation steps	Dates
Notice of first stage consultation and Issues Paper published	5 January 2024
First stage submissions closed	5 February 2024
Draft Determination & Notice of second stage consultation published	24 June 2024
Submissions due on Draft Determination	22 July 2024
Final Determination published	September 2024

Prior to the submissions due date, stakeholders can request a meeting with AEMO to discuss the issues and proposed changes raised in this Draft Report.

[2] At https://www.aer.gov.au/system/files/AER%20-%20Forecasting%20best%20practice%20guidelines%20-%2025%20August%202020.pdf.

[3] At https://aemo.com.au/consultations/current-and-closed-consultations/consultation-on-forecasting-accuracy-report-methodology

2. Background

2.1. Context for this consultation

AEMO is required by the FBPG to make the Methodology accessible to stakeholders to facilitate engagement and clear communication with stakeholders[4]. The previous consultation on the Methodology was undertaken in 2020. AEMO is required to consult on the methodologies comprising its Forecasting Approach, including the Methodology, every four years, in line with the FBPG.

2.2. The national electricity objective

Within the specific requirements of the NER applicable to this proposal, AEMO will seek to make a determination that is consistent with the national electricity objective (NEO) and, where considering options, to select the one best aligned with the NEO.

The NEO is currently expressed in section 7 of the National Electricity Law (NEL) as:

to promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity with respect to:

a. *price, quality, safety, reliability and security of supply of electricity; and*

b. *the reliability, safety and security of the national electricity system; and*

c. *the achievement of targets set by a participating jurisdiction—*

   i. *for reducing Australia's greenhouse gas emissions; or*

   ii. *that are likely to contribute to reducing Australia's greenhouse gas emissions.*

[4] At https://www.aer.gov.au/system/files/AER%20-%20Forecasting%20best%20practice%20guidelines%20-%2025%20August%202020.pdf

3. List of material issues

3.1. Methodology changes arising from a University of Adelaide review

Consistent with section 4 of AEMO's Reliability Forecast Guidelines, AEMO engaged an external expert to review the Methodology prior to undertaking this consultation. This review, undertaken by the University of Adelaide (**the University**)[5], made 26 recommendations, some of which would require amendments to the Methodology if adopted.

The table below lists the recommendations made by the University and AEMO's proposed response as published in the consultation paper.

Recommendation	AEMO draft response
General recommendations	
1. Continue with the use of the forecast categories and reporting methodologies described in Table 4 of the "Forecast Accuracy Report methodology", dated August 2020.	No change required.
2. Continue with the use of forecast accuracy reporting as a tool to drive improvements in the forecasting methodology.	No change required.
3. Continue with the use of Definition 3 for percentage error. It is the more easily interpreted definition given the framing of the report as assessing the accuracy of the forecast against the actual. Ensure that this framing is used consistently throughout.	No change required.
4. Consider providing information for each row in Table 1 of each Annual Report indicating the assessability of that metric, using the three categories defined in Section 2.2.1 of each Annual Report.	AEMO accepts the recommendation and has implemented it in the draft Methodology.
5. Rewrite the description of a box plot to prevent potential confusion between outliers and the maximum/minimum.	AEMO accepts the recommendation and has implemented it in the draft Methodology.
6. Consider the introduction of enhanced representations of weather in the descriptions and the models to enable a more rigorous analysis of accuracy	While AEMO agrees with the recommendation, it predominantly relates to the demand forecast methodology, rather than the accuracy report methodology. AEMO proposes to update the demand forecast methodology to reflect an enhanced representation of weather where this aligns with the relevant demand forecasting methodology.
General recommendations that may not be achievable in the short term	
7. Consider opportunities to benchmark the accuracy of the forecasts against other organisations.	While AEMO acknowledges the value in this recommendation, it considers that the effort required to implement it is not proportional to the anticipated benefit and does not propose to implement. No change made.
8. Consider introducing 2-year and 4-year assessments of the accuracy of certain key elements of the forecasts in the annual reporting process	AEMO agrees with this recommendation in some circumstances and it is related to the Methodology. AEMO agrees that multi-year assessments of forecast accuracy are beneficial in some circumstances, and has included multi-year assessments only for the most material forecast components, such as energy consumption, maximum demand, and generator outage rates.

[5] At https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/accuracy-report/2023-review-of-forecast-accuracy-metrics-report.pdf?la=en.

Operational energy consumption forecasts	
9. Continue with the use of percentage error and percentage impact on forecast of total consumption and with the use of tables and waterfall diagrams to represent them.	No change required.
10. Replace equation 2 on page 17 of the "Forecast Accuracy Reporting methodology" paper dated August 2020 with the equation Error from forecast component = input coefficient (input forecast – input actual)	AEMO accepts the recommendation and has implemented it in the draft Methodology.
11. Reorder all the waterfall diagrams to be consistent with the new equation 2 so that each waterfall figure starts with the Actual and presents all the component errors in the forecast that are required to reach the Forecast.	AEMO accepts the recommendation and has implemented it in the draft Methodology.
12. Ensure that the order and labels of the components in all waterfall diagrams and associated tables are consistent. Consider if it is appropriate to present the three supply-side components (that require a reverse of sign) first in each table and waterfall diagram.	AEMO accepts the recommendation and has implemented it in the draft Methodology.
Extreme demand forecasts	
13. Continue the use of a discussion-based approach and the use of figures that provide meaningful information about the distribution and drivers of the forecast.	No change required.
14. Retain Figure 15, (and its associated versions for each region) in future Annual Reports. Review the choice of driving parameters that are displayed and how each parameter is presented.	AEMO accepts the recommendation and has implemented it in the draft Methodology.
15. Consider whether it would be more appropriate to provide the monthly maximum demand figures based on only 10%, 50% or 90% probability of exceedance (POE) traces, or provide them based on the combination of the 10%, 50% and 90% POE traces all together.	AEMO accepts the recommendation and has implemented it in the draft Methodology to reflect alternate options that better reflect a combined distribution, or separate distributions per POE.
Supply forecasts	
16. Continue using the figures for total availability and component generation for each region.	No changes.
17. Restricting the graph to the central 95% is a commonly used and entirely appropriate approach. However, consideration could also be given to other/// approaches that are designed to achieve a similar degree of interpretability.	AEMO accepts the recommendation and has implemented it in the draft Methodology to reflect the provision of both the 100% range, and the central 95th percentile ranges.
18. Forecast and actual generation count and capacity tables should be restructured so that forecasts are provided to the left of the actuals and that the comparison column is calculated as (forecast – actual) so that the final column follows the generic definition of percentage error.	AEMO accepts the recommendation and has implemented it in the draft Methodology.
19. Consider providing an equivalent analysis of the accuracy of supply forecasts in the most important supporting regions based on the top 10 hottest days in the supported region.	AEMO accepts the recommendation and has implemented it in the draft Methodology to specify that analysis of supporting region supply forecast assessments will be included where relevant.
20. Consider whether the accuracy of VRE generation forecasts could be presented consistently on a generation basis through both the forecast and reported data.	AEMO accepts the recommendation and has implemented it in the draft Methodology to apply VRE generation, rather than availability, in the assessment of both forecasts and actuals.
21. Consider modifying the trigger categories into disjoint categories (eg ">=$300/MWh AND <$500/MWh" for the lowest trigger category). Further, consider reducing the number of categories to ensure sufficient events in each (disjoint) category while maintaining signal and interpretability.	While AEMO agrees with the recommendation, it predominantly relates to the demand side participation (DSP) forecast methodology, rather than the accuracy report methodology. AEMO proposes to update the DSP methodology to reflect an enhanced representation of price bands, and will update the forecast accuracy methodology where this aligns with the relevant DSP forecasting methodology.

22. Consider reporting the accuracy of the demand side participation forecasts by comparing the forecast distribution with the observed distribution, this could be achieved using side-by-side box plots or violin plots, for example.	AEMO accepts the recommendation and has implemented it in the draft Methodology.
23. Investigate ways to clarify the presentation in the "DSP response during reliability events" section to assist the reader's understanding.	AEMO accepts the recommendation and has implemented it in the draft Methodology to specify the components that should be described when assessing the DSP response during reliability events.
Potential modelling improvements	
24. Consider the introduction of further industry segmentation to improve consumption forecasting.	While AEMO agrees with the recommendation, it does not relate to this Methodology, hence will not be included. This recommendation was discussed in the 2023 Forecast Improvement Plan under consultation as part of the 2023 Forecast Accuracy Report.
25. To increase the robustness of the forecast process, increase the number of weather years that are incorporated. This could be achieved by using more historical data or, preferably, by making use of synthetic weather years.	While AEMO agrees with the recommendation, it does not relate to this Methodology, hence will not be included. This recommendation was discussed in the 2023 Forecast Improvement Plan under consultation as part of the 2023 Forecast Accuracy Report.
26. Consider upgrading the accuracy and level of assurance of the assumed scale factors in the Potential adjustment – voluntary load reductions feature.	AEMO accepts the recommendation and has implemented it in the draft Methodology to specify the components that should be described when assessing voluntary load reductions during reliability events.

3.1.1. AEMO's assessment and conclusion

AEMO received no feedback on the University of Adelaide recommendations, or AEMO's proposed response to those recommendations in the Forecast Accuray Report methodology consultation paper[6]. As such, AEMO considers its draft responses described above as its draft determination, and has implemented the relevant changes in the draft Methdoology.

3.2. Short-term Forecast Accuracy Report

3.2.1. Current state

The Forecast Accuracy Report (FAR) reports on the accuracy of longer-term supply and demand forecasts and other inputs that AEMO considers material to reliability forecasts which are used in the Electricity Statement of Opportunities (ESOO) consistent with NER clause 3.13.3A(h)(1).

3.2.2. Summary or submission

The Energy Users' Association of Australia (EUAA) considered that the FAR is inadequate for, and does not compare, shorter-term forecast data prepared by AEMO (for example, Pre-Dispatch PASA – PD PASA, Short Term PASA -ST PASA, Reliability Emergency Reserve Trader - RERT, Lack of Reserve – LOR).

3.2.3. AEMO's assessment and conclusion

The FAR relates to the ESOO as per the Methodology and AEMO's obligation under NER clause 3.13.3A(h). Other forecasts are outside the scope of the Methodology. The NER does not require or

[6] At https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2024/consultation-on-forecasting-accuracy-report-methodology/forecast-accuracy-report-methodology-consultation-paper.pdf?la=en

provide for AEMO to publish forecast accuracy reports over the shorter-term forecasts, and this would be outside the scope of the FAR.

3.3. Independent assessor of the Forecast Accuracy Report (FAR)

3.3.1. Current state

The FAR is published by AEMO consistent with NER 3.13.3A(h) obligation.

3.3.2. Summary or submission

The EUAA submitted that the FAR Methodology should be updated to create independence between the forecasters at AEMO and those who prepare the FAR AEMO's assessment and conclusion. The EUAA argued that this would help to ensure impartiality in the report's preparation.

3.3.3. AEMO's assessment and conclusion

AEMO has an obligation to generate the FAR under NER 3.13.3A(h). This obligation is also mentioned in the FBPG and Reliability Forecast Guidelines. In many cases, the Forecast Accuracy Report methodology is able to be applied by interested parties given the detailed data AEMO publishes. However, in some cases, AEMO deploys additional unpublished data to generate the accuracy report, which would be challenging for a third party to undertake.

AEMO notes that the FAR regularly identifies deficiencies in some components of AEMO's forecasting approach, triggering improvements. While an independent assessor of the FAR may provide some stakeholders with additional confidence of independence, AEMO does not consider this to be a practical approach, and further considers that this approach is not in line with the current NER obligation.

4. Conclusion

AEMO has released a draft Methodology implementing some of the University of Adelaide's recommendations and other minor amendments. AEMO welcomes further feedback on this draft Methodology as part of stage 2 of this consultation.