

# FORECASTING APPROACH - ELECTRICITY DEMAND FORECASTING METHODOLOGY

NOTICE OF CONSULTATION AND ISSUES PAPER

Published: **December 2020**





## NOTICE OF FIRST STAGE CONSULTATION – FORECASTING APPROACH - ELECTRICITY DEMAND FORECASTING METHODOLOGY

### Forecast Best Practice Guidelines

#### Date of Notice: 18 December 2020

This notice informs all Registered Participants and interested parties (**Consulted Persons**) that AEMO is conducting a consultation on its Draft Electricity Demand Forecasting Methodology, which forms part of its Forecasting Approach.

This consultation is being conducted under section 2.1 of the Australian Energy Regulator’s (AER) Forecasting Best Practice Guidelines<sup>1</sup> (**FBPG**), in accordance with its Appendix A consultation procedure.

#### Matter under Consultation

As AEMO has not previously formally consulted on this methodology under the requirements of the FBPG, AEMO invites comment from stakeholders on any matter contained in the methodology. To aid stakeholders in providing feedback, several questions are posed throughout the methodology.

AEMO notes that historically the methodology has been updated and published annually. This version’s main difference to prior versions is outlined in the Appendix of this Notice of Consultation and Issues Paper.

A consultation draft of the Electricity Demand Forecasting Methodology is also published with this notice and the Issues Paper.

#### The Consultation Process

The consultation process is outlined below. Dates are indicative only and subject to change.

Process Stage	Indicative date
Closing date for submissions in response to this Notice and Issues Paper	21 January 2021
Publication of Draft Report and Determination	18 February 2021
Closing date for submissions in response to the Draft Report	18 March 2021
Publication of Final Report and Determination	29 April 2021

#### Invitation to Make Submissions

AEMO invites written submissions on the Draft Electricity Demand Forecasting Methodology, including any alternative or additional proposals you consider may better meet the FBPG, objectives of this consultation and the national electricity objective in section 7 of the National Electricity Law.

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.

Please note that material identified as confidential may be given less weight in the decision-making process than material that is published.

<sup>1</sup> See: <https://www.aer.gov.au/system/files/AER%20-%20Forecasting%20best%20practice%20guidelines%20-%2025%20August%202020.pdf>.



## **Meetings**

In your submission, you may request a meeting with AEMO to discuss the matter under consultation, stating why you consider a meeting is necessary or desirable.

If appropriate, meetings may be held jointly with other Consulted Persons. Subject to confidentiality restrictions, AEMO will generally make details of matters discussed at a meeting available to other Consulted Persons, and may publish them.

## **Closing Date and Time**

Submissions in response to this Notice of First Stage of Consultation should be sent by email to [energy.forecasting@aemo.com.au](mailto:energy.forecasting@aemo.com.au), to reach AEMO by 5.00pm (Melbourne time) on 21 January 2021.

*All submissions must be forwarded in electronic format (either pdf or Word). Please send any queries about this consultation to the same email address.*

Submissions received after the closing date and time will not be valid, and AEMO is not obliged to consider them. Any late submissions should explain the reason for lateness and the detriment to you if AEMO does not consider your submission.

## **Publication**

*All submissions will be published on AEMO's website, other than confidential content as outlined above.*

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## EXECUTIVE SUMMARY

The publication of this Issues Paper commences the first stage of the consultation on AEMO's Electricity Demand Forecasting Methodology under the Forecast Best Practice Guidelines<sup>2</sup> (FBPG) consultation process. AEMO's Electricity Demand Forecasting Methodology forms part of its Forecasting Approach.

AEMO is consulting on the Electricity Demand Forecast Methodology, which describes the breadth of methodologies applied in forecasting electricity consumption as well as maximum and minimum demand. The methodologies are applied in forecasting Australia's major electricity systems – the National Electricity Market (NEM) and the Wholesale Electricity Market (WEM) in Western Australia. In particular, the methodology describes:

- Annual consumption forecasting of various consumer sectors and sub-sectors.
- Maximum and minimum demand forecasting.
- Production of half-hourly demand traces.

AEMO is seeking feedback on whether the methodology is fit for use in AEMO's Electricity Statement of Opportunities (ESOO) and other medium to longer term reliability assessments and system planning purposes, including the Integrated System Plan (ISP).

Stakeholders are invited to submit written responses on the issues identified in this paper by 5.00 pm (Melbourne time) on 21 January 2021, in accordance with the Notice of First Stage of Consultation published with this paper.

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<sup>2</sup> As outlined in Appendix A of the Australian Energy Regulator's Forecasting Best Practice Guidelines: <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 is consulting on its Draft Electricity Demand Forecasting Methodology, which forms part of its Forecasting Approach, in accordance with the Appendix A consultation process of the Forecasting Best Practice Guidelines<sup>3</sup> (FBPG).

AEMO’s indicative timeline for this consultation is outlined below. Dates may be adjusted depending on the number and complexity of issues raised in submissions and any meetings with stakeholders.

Deliverable	Indicative date
Issues Paper published	18 December 2020
Submissions due on Issues Paper	21 January 2021
Draft Report published	18 February 2021
Submissions due on Draft Report	18 March 2021
Final Report published	29 April 2021

With a submission, a stakeholder can request a meeting with AEMO to discuss the matter under consultation.

Note that there is a glossary of terms used in this Issues Paper at Appendix B.

## 2. BACKGROUND

### 2.1. Forecast Best Practice Guidelines requirements

Section 2.1 of AER’s FBPG requires AEMO to use its Appendix A consultation process to review the components of its Forecasting Approach at least every four years.

### 2.2. Context for this consultation

Since 2012, AEMO has developed and published consumption and demand forecasts<sup>4</sup> for the National Electricity Market (NEM) for use in the Electricity Statement of Opportunities (ESOO) and other medium to longer term reliability assessment and system planning purposes. In particular, these consumption and demand forecasts also underpin AEMO’s Integrated System Plan.

The associated forecast methodology has been documented annually, and the approach has seen ongoing discussion with stakeholders at various forums, including the Forecasting Reference Group (FRG) and technical workshops.

From November 2018 to February 2019, AEMO undertook consultation on the effectiveness of the methodology documentation in communicating AEMO’s electricity forecasting approach. The methodology documentation was updated based on feedback from that consultation<sup>5</sup>.

The Draft Electricity Demand Forecasting Methodology published alongside this Issues Paper has been reviewed and updated since its last publication with the 2020 ES00<sup>6</sup>. The previous annual publications of the methodology document included some discussion of inputs and assumptions, which have now been

<sup>3</sup> At: <https://www.aer.gov.au/system/files/AER%20-%20Forecasting%20best%20practice%20guidelines%20-%2025%20August%202020.pdf>.

<sup>4</sup> These were initially published as the National Electricity Forecasting Report (NEFR). Until 2015, the maximum demand forecasting component was outsourced to Monash University under guidance from AEMO. Prior to 2012, AEMO compiled regional forecasts from the Transmission Network Service Providers, with only Victorian and South Australian forecasts being produced internally.

<sup>5</sup> See: <https://aemo.com.au/en/consultations/current-and-closed-consultations/national-electricity-market-demand-forecasting-methodology-issues-paper-consultation>.

<sup>6</sup> See: [https://aemo.com.au/-/media/files/electricity/nem/planning\\_and\\_forecasting/inputs-assumptions-methodologies/2020/2020-electricity-demand-forecasting-methodology-information-paper.pdf](https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/inputs-assumptions-methodologies/2020/2020-electricity-demand-forecasting-methodology-information-paper.pdf).



moved to the Inputs, Assumptions and Scenarios Report (IASR). The IASR is undergoing a separate, simultaneous consultation<sup>7</sup>. This consultation is limited to the methodologies described in the Draft Electricity Demand Forecasting Methodology published alongside this Issues Paper. Feedback on the relevant inputs and assumptions are welcome to the Draft 2021 IASR consultation.

### 2.3. Principles for this consultation

The following principles guide this consultation's considerations and priorities:

- Forecasts should be as accurate as possible, based on comprehensive information and prepared in an unbiased fashion.
- The basic inputs, assumptions and methodology that underpin forecasts should be disclosed.
- Stakeholders should have as much opportunity to engage as is practicable.

In the context of this consultation, the first principle requires that the methodology is fit for purpose. The second requires the methodology to be well described. The third is satisfied through the consultation process outlined in Section 1.

## 3. PROPOSALS AND ISSUES FOR CONSULTATION

AEMO has published a Draft Electricity Demand Forecasting Methodology along with this Issues Paper. This is available at: <https://aemo.com.au/consultations/current-and-closed-consultations/electricity-demand-forecasting-methodology>.

As AEMO has not previously consulted on the methodology using the FBPG consultation process, AEMO seeks feedback on any parts, or the entirety, of the Draft Electricity Demand Forecasting Methodology. To guide stakeholder feedback, the draft methodology document includes a number of specific questions.

Stakeholders are asked to comment on the appropriateness of the various forecasting components listed within the methodology, including:

- Annual consumption forecast:
  - Business sector, including large industrial loads
  - Residential sector
- Maximum and minimum demand forecasts
- Half-hourly electricity demand traces
- Input/component forecasts feeding into one or more of the above, including, for example:
  - Rooftop PV and non-scheduled PV generation
  - Battery storage
  - Electric vehicles

For stakeholders familiar with the previous methodology document, Appendix A outlines the main changes in the Draft Electricity Demand Forecasting Methodology published for consultation compared with the previous version issued alongside the 2020 ES00<sup>8</sup>. As previously noted, any issues related to inputs and assumptions should be addressed through the simultaneous IASR consultation<sup>9</sup>.

<sup>7</sup> Available at: <https://aemo.com.au/consultations/current-and-closed-consultations/2021-planning-and-forecasting-consultation-on-inputs-assumptions-and-scenarios>.

<sup>8</sup> See: [https://aemo.com.au/-/media/files/electricity/nem/planning\\_and\\_forecasting/inputs-assumptions-methodologies/2020/2020-electricity-demand-forecasting-methodology-information-paper.pdf](https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/inputs-assumptions-methodologies/2020/2020-electricity-demand-forecasting-methodology-information-paper.pdf).

<sup>9</sup> Available at: <https://aemo.com.au/consultations/current-and-closed-consultations/2021-planning-and-forecasting-consultation-on-inputs-assumptions-and-scenarios>.



## APPENDIX A - CHANGES SINCE PREVIOUS PUBLICATION

### A.1 Removing Inputs and Assumptions

To avoid unnecessary duplication, the Electricity Demand Forecasting Methodology document no longer contains inputs and assumptions, which are in the annually updated IASR. Therefore, the methodology document now only describes the forecasting methodologies used. This allows inputs and assumptions to be updated at least annually, while leaving the Electricity Demand Forecasting Methodology substantially unchanged, if appropriate.

In places, like Section 4 and Appendices A3 and A4, this has led to major revisions of the text. Also, the former Appendix A6 – Data sources has been removed as it is entirely captured within the IASR now.

### A.2 Clarify where WEM approach differs

Some sections have been updated to clarify where the methodology differs between the NEM and WEM. Specifically, Section 2 for identifying Large Industrial Loads and Table 1 in Section 2.2.1 have been updated.

### A.3 Flexibility in how inputs are sourced

AEMO may source data from one or more consultants, or may choose not to in years where an update is unwarranted. This has led to changes in wording in a number of places, including:

- How energy efficiency data is updated in Section 2.2.2 – Long Term Causal modelling
- The sourcing of distributed PV forecasts (Appendix A3), electric vehicles forecasts (Appendix A4) and appliance uptake forecasts (Appendix A5)

Instead, the annual IASR – subject to separate stakeholder consultation – will explain how these inputs are sourced.

### A.4 Network Losses

Section 4.2 – Network Losses has been updated so that a trend, such as falling network losses due to increased rooftop PV uptake, can be used rather than the latest actual as forecast. If no trend is identified, AEMO will continue to use the latest actual as forecast.

### A.5 Trace growth algorithm

The example of how the demand trace scaling algorithm works (Section A7) has been expanded to include the third pass, which was explained in Section 6.4 but not covered in the example.

### A.6 Improving Readability

To improve consistency throughout the document, various wording, terminology and formulae changes have been implemented. Specifically, Sections 2 and 3 have been updated to increase consistency in how the business and residential forecast methodologies are presented. The terminology has been updated for consistency and better context now that the inputs and assumptions are no longer in the document. Additionally, the presentation of figures is now consistent throughout the document.



## APPENDIX B - GLOSSARY

Term or acronym	Meaning
AEMO	Australian Energy Market Operator Limited
ESOO	Electricity Statement of Opportunities
FBPG	Forecasting Best Practice Guidelines
IASR	Inputs, Assumptions and Scenarios Report
NEM	National Electricity Market
PV	Photovoltaics
SME	Small – Medium Enterprises
WEM	Western Australian Wholesale Electricity Market