



**Energy Security Board
Forecasting Technical Working Group**

Forecasting - Methodology and accountability

Issues Paper

Introduction

The purpose of this paper is to facilitate discussions with Jurisdictions and the Technical Working Group (TWG) on the detailed design elements of forecasting methodology and accountability. Following the SCO Reference Group and TWG meetings, a more detailed technical working paper will be developed. The technical working papers and draft final design document will be available for public consultation in mid-June.

High level design

The ESB has agreed the following design elements relating to forecasting the reliability requirement:

- Using the Electricity Statement of Opportunities (ESOO), AEMO will forecast whether the reliability standard is likely to be met (or not) in any NEM region over a 10-year outlook period. If the forecast is that the reliability standard will not be met, AEMO will identify the size of any 'gap' in supply/demand response.
- These forecasts will also detail the pipeline of potential generation projects over the forecast period along with the progress of their development.
- In developing the forecasts, AEMO will be required to publish, for public consultation, its inputs, assumptions and methodology for determining the reliability requirement.
- An appropriate accountability framework will be introduced to support and improve the development of these forecasts which will include rules pertaining to transparency and stakeholder consultation.
- The intention of the Guarantee is to remain aligned to the Reliability Standard whilst ensuring there are adequate resources available to meet peak (as opposed to average) demand.

Detailed design elements for TWG input

1. Developing forecasts for the Reliability Requirement
2. Accountability framework to support and improve the development of forecasts

Issues for discussion

1. Developing forecasts for the Reliability Requirement

Forecasting of the reliability gap and confidence in this process is fundamental to the ongoing success of the Guarantee. The Guarantee is designed to incentivise retailers to contract in way that should encourage investment in dispatchable resources through an obligation that will be triggered based on the forecast gap. To be most effective, forecasts need to be well regarded by all participants. They must be agreed best practice and perceived as reliable and appropriate for their intended purpose. They should provide a transparent, well understood and stable framework for retailers and large customers to predict the scale and scope of their obligations well in advance, along with the potential cost of non-compliance.

In the high level design the ESB has committed to the use of the ESOO forecasting process to forecast reliability in each region for the next ten years. At present AEMO publishes the ESOO by 31 August each year, which includes a 10-year outlook for supply and demand. A range of supporting material is currently published on the AEMO website which informs the development of these forecasts. This includes input assumptions and a description of the methodology used to develop both the demand and supply forecasts that are used to produce the unserved energy (USE) forecast. These are outlined as part of the published supporting material on the AEMO website (referred to below).

Generation information ([generation information](#)) collected from industry participants as part of a regular industry survey is also used as a key input into the ESOO modelling. AEMO reports information on the capacity of existing, withdrawn, committed, and proposed generation projects in the NEM.

The ESOO evaluates and compares committed electricity supply information provided by industry with operational consumption and maximum demand forecasts, to identify potential USE in excess of the reliability standard over a 10-year outlook period. The current NEM reliability standard allows 0.002% of energy demand to be unmet in a given region per financial year.

To calculate the expected USE, AEMO uses a probabilistic approach, which calculates an average USE over a number of demand outcomes (based on seven historical reference years) and random generator outages. Generator outage rates are calculated based on historical performance data.

There are a number of factors which in the future will be more challenging to account for in forecasting. These factors include the visibility of the extent of demand response in the market, the treatment of the inherent variability of wind and solar generation, and the predictability of behind-the-meter battery charging/discharging profiles.

For example, AEMO has noted that accurately capturing the extent of demand response capacity in the NEM is challenging. AEMO currently runs a mandatory [Demand Side Participation Information](#) disclosure process, which requires registered participants to disclose the level of demand response capacity on an annual basis. A comprehensive understanding of DR capacity in the NEM will be essential to accurate capacity forecasting.

Further discussion with TWG is required to understand the level of confidence in current forecasting processes for the ESOO and the questions below are intended to draw comment around the processes and assumptions currently used.

Links to information on AEMO website:

- ESOO:
 - August 2017 – <http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/NEM-Electricity-Statement-of-Opportunities>
- Demand forecasts (inputs into ESOO modelling):

- March 2018 – <http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Electricity-Forecasting-Insights/2018-Electricity-Forecasting-Insights>
- June 2017 – <http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/Electricity-Forecasting-Insights>
- June 2012 to June 2016 – <http://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Planning-and-forecasting/National-Electricity-Forecasting-Report> *

Questions for the TWG

- Are current forecasting methodologies appropriate? What further improvements would enhance the forecasting process? Is the current methodology and set of input assumptions underpinning the ESOO modelling fit-for-purpose?
- Are there changes to the ESOO required to ensure forecasts are appropriate for all time periods – from 1 year to 10 years ahead?
- Given the MTPASA process is currently updated more frequently than the ESOO, should the MTPASA process be used for the years where it would be applicable? Are there challenges with this approach from a consistency perspective?
- Is the timing of the ESOO publication and any updates fit-for-purpose?
- Is the information collected as part of the generation information survey fit-for-purpose?
- How should demand response be considered in the modelling?
- How should renewable generation resources be considered in the modelling?
- What should be assumed for behind-the-meter battery charging/discharging profiles?
- What other information might be helpful for liable entities to understand how the supply-demand outlook is changing? For example, progress of generation projects towards completion.
- What extra data and information should be considered?
- Are there missing considerations in the modelling and assumptions?

2. Accountability framework to support and improve the development of forecasts

In the high-level design, the ESB committed to ensuring that an appropriate accountability framework was introduced to support and improve the development of the forecasts used for the Reliability Requirement. This framework will require that rules pertaining to transparency and stakeholder consultation are implemented by the ESB.

AEMO currently engages widely through a variety of forums including a monthly Forecasting Reference Group meeting and a regular Market Modelling Working Group. These forums discuss AEMO's program of work which supports all forecasting publications, including the ESOO. The discussion covers methodology and input assumptions, and a presentation of draft forecasts, where AEMO offers industry and government stakeholders the opportunity to work collaboratively to improve current forecasting processes.

The design of the Guarantee and its linkage to forecasting the reliability gap using the ESOO process will fundamentally change the impact on liable entities. Prior to this, liable entities could plan around the ESOO forecasts or alternatively develop their internal own view. While the Guarantee does not change

how liable entities will view the projections for the market it will risk an obligation being triggered under the requirement. Consequently, it is important for the TWG to comment on the current engagement processes and how they should change given this context.

Links to information on AEMO website:

Forecasting Reference Group: <http://www.aemo.com.au/Stakeholder-Consultation/Industry-forums-and-working-groups/Other-meetings/Forecasting-Reference-Group>

Questions for the TWG

- How can the forecasting process be made more robust, transparent and accountable?
- What information related to the assumptions and methodology needs to be accessible to ensure transparency and accountability?
- What supporting information is currently missing from this already published material?
- What consultation processes need to be maintained or created to ensure transparency in the forecasting process? How frequently should these consultations be held?
- How should the ESB implement these transparency and accountability measures in the rules?

Interdependencies with other elements of the Guarantee

- Forecasting – calculating the reliability gap
- Contracts - Procurer of Last Resort
- Penalties and Compliance