

DRAFT MINUTES – Forecasting Reference Group (FRG)

MEETING: #10

DATE: Tuesday 22 August 2018

CONTACT: Energy.Forecasting@aemo.com.au

ATTENDEES:

| NAME | ORGANISATION | LOCATION |
|------------------------|--------------------------------------|----------------|
| Andrew Turley | AEMO | Brisbane |
| Dane Winch | AEMO | Brisbane |
| Elijah Walker | AEMO | Brisbane |
| Jason West | AEMO | Brisbane |
| Luminita Baloi | AEMO | Brisbane |
| Nick Culpitt | AEMO | Brisbane |
| Nicola Falcon | AEMO | Melbourne |
| Phil Travill | AEMO | Melbourne |
| Tania McIntyre (Chair) | AEMO | Melbourne |
| Vivian Mai | AEMO | Melbourne |
| Jacqui Bridge | Ausnet | Melbourne |
| Duncan Mackinnon | Australian Energy Council | Melbourne |
| Russell Farmer | Energy Australia | Melbourne |
| Alan Shu | Jemena | Melbourne |
| Tan Bui | Jemena | Melbourne |
| Panos Priftakis | Snowy Hydro | Melbourne |
| Sujeewa Vithana | United Energy | Melbourne |
| Alister Rathie | Alinta | Sydney |
| Adrian Hart | BIS Oxford Economics | Sydney |
| James Lumkin | Jemena | Sydney |
| James Osborne | Jemena | Sydney |
| John Sligar | Sligar and Associates | Sydney |
| Arindam Sen | Transgrid | Sydney |
| Craig Oakeshott | AER | Teleconference |
| Paul Grzinic | Aurora Energy | Teleconference |
| Lucy Cooper | ARENA | Teleconference |
| Scott Turner | EDL | Teleconference |
| Brad Parker | ElectraNet | Teleconference |
| Andrew Godfrey | Energy Australia | Teleconference |
| David Hoch | Engie | Teleconference |
| Brent Hudson | Essential Energy | Teleconference |
| Bryan Scott | Hydro Tasmania | Teleconference |
| Joel Gilmore | Infigen Energy | Teleconference |
| David Headberry | Major Energy Users | Teleconference |
| Trevor Bornstein | Origin Energy | Teleconference |
| Damijan Krilevski | Powercor | Teleconference |
| Steven Rawlins | Powerlink | Teleconference |
| Phil Pollard | Queensland Electricity Users Network | Teleconference |
| Jennifer Brownie | Queensland Electricity Users Network | Teleconference |
| James Bennett | SA Power Networks | Teleconference |
| Herath Samarakoon | Tasnetworks | Teleconference |

1. Welcome and Introductions

Tania McIntyre (AEMO) welcomed attendees to the August 2018 Forecasting Reference Group (FRG) meeting.

2. Previous minutes and action items

The meeting minutes from the 26 July 2018 FRG were accepted by attendees and finalised. Tania McIntyre (AEMO) provided updates on the actions register with special reference given to previous action 9.3.1, in relation to upcoming AEMO methodology workshops. A demand forecasting workshop has been planned for November 2018 but a date is yet to be set.

3. Forward Plan for FRG

Tania McIntyre (AEMO) presented on proposed agenda items for the 24 September 2018 FRG meeting.

A forward plan detailing upcoming FRG topics will be circulated to FRG participants and made available on the AEMO website shortly ([Action 10.3.1](#)). The forward plan is aimed to allow participants to have greater time to prepare for discussions that appeal to them, adding further value to FRG forums. Following a question raised by Russell Farmer (Energy Australia) about the expectation of participants' involvement in FRG, Nicola Falcon (AEMO) stressed that the FRG forum is intended to be a two-way exchange of information and feedback to assist participants' decision making and to improve AEMO's forecasts.

Participants are encouraged to forward agenda items to interested colleagues within their organisation. Suggestions or queries regarding the forward plan are to be sent to

Energy.forecasting@aemo.com.au

4. Generator Outage Survey Outcomes and Implementation in Reliability Assessment

Phil Travill (AEMO) presented on the *Generator Outage Survey Outcomes and Implementation in Reliability Assessment* slides (included in the August 2018 meeting pack). The presentation provided a detailed description of how AEMO implements generator outage data provided by participants into reliability studies such as in the Electricity Statement of Opportunities (ESOO). For data integrity purposes, the effect of outage parameters in 2018 ESOO modelling was compared to recent historical observations.

Key points raised by stakeholders during this presentation included:

- David Headberry (Major Energy Users Inc.) raised a question in regard to whether AEMO captures the effect of “time of day” on intermittent renewable generators as it could have different effects on performance of wind and solar generators. Nick Culpitt (AEMO) replied that the “time of day” effect is considered in AEMO model.

- Furthermore, there are situations in which the performance of some generators are limited to below their full capacities such as due to high temperatures in a day etc.
- Russell Farmer (Energy Australia) enquired as to whether outage parameters calculated by AEMO included data from retired generators such as Hazelwood Power Station. Phil Travill (AEMO) informed participants that retired units were excluded from all calculations of parameters.
 - Stakeholders queried whether a regression had been run on the effects of age on outage parameters. Nick Culpitt (AEMO) answered such regression analysis was not performed given the relatively small dataset. Russell Farmer (Energy Australia) added to the discussion that investment decisions undertaken by firms, such as extending station life and upgrading units can have large consequences on outage parameters. Nicola Falcon (AEMO) summarised that with the limited availability of generator outage data, the over-time behaviour can appear quite erratic. As a result, it is difficult to reduce the data down to single parameters given the significant impact these values have on available capacity and consequently expected unserved energy (USE) in models.
 - Russell Farmer (Energy Australia) questioned how parameters for the high forced outage scenario were determined. Phil Travill (AEMO) noted that the highest full forced outage rate from the past three years for each aggregation, except the open cycle gas turbines (OCGTs). The second highest rate for OCGTs was implemented due to a perceived outlier in the data. Nick Culpitt (AEMO) furthered this conversation by stating that the purpose for this sensitivity is to illustrate to the market the material impact of assumptions (in this case, outage parameters) on reliability studies.
 - A question was raised as the distribution used by AEMO in determining the average outage time in PLEXOS models. Nick Culpitt (AEMO) noted that with 1600 samples being implemented in modelling, the average time of outages is included as a static value rather than a distribution. Nick Culpitt (AEMO) further elaborated that failed starts are not included in outage parameters for OCGTs.
 - John Sligar (Sligar and Associates) asked how outages for wind and solar farms are captured in modelling. Nick Culpitt (AEMO) answered that the outages of wind and solar farms are modelled using a method which is based on historical performance captured through generation trace profiles. Such profiles enable AEMO to capture the variability of outages and availability of generation, without having the outage parameters of wind and solar farms being specified explicitly in the model.
 - Russell Farmer (Energy Australia) questioned whether AEMO examine the outages at the individual level of generator units. Nick Culpitt (AEMO) responded that AEMO does look at individual generators, some consistently underperform against the aggregate outage parameters whilst some outperform while others are a mix.
 - Nicola Falcon (AEMO) concluded the session noting that forecasting accuracy on supply is as important and material as demand forecasting, especially in a reliability

context. Hence, AEMO will continue to monitor the accuracy and improve its supply forecast modelling.

5. Maximum Demand Probability of Exceedance Forecasts and Weightings for Assessing USE in ESOO Update

Magnus Hindsberger (AEMO) provided an update on studies regarding *the Maximum Demand Probability of Exceedance (POE) forecasts and weightings* which was discussed in [June 2018 FRG](#). The presentation included a recap on previous approaches to implementing forecasts and weightings before moving onto an explanation of recent work conducted by AEMO.

Key discussion points during the presentation included:

- Russell Farmer (Energy Australia) queried as to what data was tested for normal distribution. Magnus Hindsberger (AEMO) clarified the process in which 2000 samples were generated from the maximum demand model. The resulting distribution of maximum demand values are then tested for normality through a Jarque-Bera test. Through the course of the investigation, it was determined that the data failed the normality test but the results were not far off.
- A question was raised as to whether the analysis separated summer and winter periods and regions. Magnus Hindsberger (AEMO) verified that both seasons were considered.
- Tan Bui (Jemena) raised concerns that the assumption of 90% POE outcome to be zero USE is too significant from a network provider's perspective, it may result in an underestimation of risk. Magnus Hindsberger (AEMO) and Nick Culpitt (AEMO) responded that the adopted assumptions and conducted tests are in a context of generation capacity and regional supply adequacy. From this particular angle, given the outcome of 90% POE is found to be substantially lower than that of the 50% POE in most peak demand cases, the contribution of 90% POE to expected USE is completely dwarfed by the 10% and 50% POE. Magnus Hindsberger (AEMO) and Nick Culpitt (AEMO) also took note of a comment from Tan Bui (Jemena) to apply a caveat to the weighting explanations as 90% POE cannot be neglected in estimating risks in network planning.
- Russell Farmer (Energy Australia) noted that the double slope from 0% to 10% POE is a simplifying assumption however acknowledged that there are limitations on the practicality of modelling a 1% POE. Further comment was made as to whether the assumption, in the linear interpolation, that the slope between the 10% and y-axis was double that of the 10% and 30% POE was valid. Magnus Hindsberger (AEMO) concurred that the assumption is challenging to quantify as a one in a hundred-year

event requires more than the available 20 years of NEM data, as well as the effect of a dynamic market over that period. Magnus asked if any of the FRG members had any references to work seeking to quantify POE forecasts for more extreme events like 5% POE (see action below).

- Russell Farmer (Energy Australia) made a further statement requesting that more data is made available to forum members prior and during FRG meetings in order for participants to follow the topics more confidently. Tania McIntyre (AEMO) responded that participant input is extremely valuable to AEMO and as such we will strive to improve on this aspect going forward.

Magnus Hindsberger (AEMO) concluded that AEMO would like to investigate the topic of forecasting extreme POE outcomes further and invited that participants continue providing their thoughts to energy.forecasting@aemo.com.au (Action item 10.5.1).

6. Generation Information Page Update and New Portal

Luminita Baloi (AEMO) presented on the recent generator information page update. Highlights from this presentation included an explanation of the new commitment classifications implemented by AEMO, the breakdown of new committed generation capacity by technology, region, and plans to improve the user experience in both submitting and reading data.

Annette Kelly (AEMO) proceeded to present on the new proposed data portal which is to improve the user experience and streamline the current process. Highlights from this section of the presentation included a description on the functionality of the new portal, advantages to the new portal and a description of how the portal will be rolled out to participants.

Key discussion points relating to the generator information page update and the new data portal included:

- Jennifer Brownie (Queensland Electricity Users Network) stated that the generation information spreadsheets, particularly the new developments tab, are fairly cumbersome to use. Luminita Baloi (AEMO) explained that details of new projects are often flexible or unknown. Properties such as the name plate capacity and unit information are often more appropriately represented by a set of values. Jennifer went on to request that AEMO include sources for all of its projects on the Generator Information Page. Luminita noted that AEMO will look to improve this going forward.
- Jacqui Bridge (Ausnet) questioned if both “committed” and “nearly committed” projects are included in reliability modelling. Nick Culpitt (AEMO) responded that depending on the project, some “committed” are included. “Nearly committed” ones are not included in reliability modelling.

- Russell Farmer (Energy Australia) agreed with AEMO's approach to assign a "participant administrator" to each participant as acknowledging a high risk to rely solely on participants. In response to a question from Jacquie Bridge (Ausnet), Luminita Baloi (AEMO) notified that the generation information page is available to the public.

7. Other Business

Jennifer Brownie (Queensland Electricity Users Network) raised concerns in relation to the upcoming Distributed Energy Resources (DER) register rule change and the quality of data that AEMO will receive as a consequence, as well as the visibility of information that may be made public. Andrew Turley (AEMO) noted the concerns but stated that the rule change process is conducted by the Australian Energy Market Commission (AEMC). Andrew noted that he would forward the concerns on to the appropriate team within AEMO to follow up directly with Jennier. (Action item 10.7.1)

8. Meeting Close

The next FRG meeting is scheduled for Tuesday 25 September 2018.

Forecasting Reference Group (FRG) Actions Items

| Item | Date Raised | Topic | Action required | Responsible | By | Status |
|--------|-------------|------------------------------|---|------------------|-------------------|----------|
| 10.3.1 | 22/08/2018 | Forward Agenda | AEMO to send participants FRG forward agenda | Nicola Falcon | 25 September 2018 | Complete |
| 10.5.1 | 22/08/2018 | POE Weightings | Participants to send AEMO suggestions on weightings calculations | Stakeholders | 25 September 2018 | Complete |
| 10.7.1 | 22/08/2018 | DER registry | AEMO to address participant concerns on the upcoming DER registry rule change | Andrew Turley | 24 August 2018 | Complete |
| 9.3.2 | 26/07/2018 | Online Data Dashboard | Participants to email AEMO on their preferred forecasting performance metrics and data for inclusion in the online dashboard. | FRG Participants | 22 August 2018 | Complete |
| 9.3.3 | 26/07/2018 | Forecasting Accuracy Metrics | Participants to advise on any improvements in forecasting performance metrics and methods. | FRG Participants | 22 August 2018 | Complete |