DRAFT MINUTES – Forecasting Reference Group (FRG)

MEETING: #9

DATE: Thursday 26 July 2018

CONTACT: Energy.Forecasting@aemo.com.au

ATTENDEES:

NAME	ORGANISATION	LOCATION
Eli Walker	AEMO	Brisbane
Michael Lee	ERM Power	Brisbane
Jonathan Dennis	Powerlink Queensland	Brisbane
Nicola Falcon	AEMO	Melbourne
Tania McIntyre (Chair)	AEMO	Melbourne
Daniel Guppy	AEMO	Melbourne
Chris Mock	AEMO	Melbourne
Vivian Mai	AEMO	Melbourne
Hua Min Situ	AEMO	Melbourne
Adrian Grantham	AEMO	Melbourne
Linton Corbet	AEMO	Melbourne
Alessio Bonato	AGL	Melbourne
Peter Young	AGL	Melbourne
Richard Paprzycki	Energy Australia	Melbourne
Russel Farmer	Energy Australia	Melbourne
Souhaib Ben Taieb	Monash University	Melbourne
Sonja Lekovic	Powercor	Melbourne
Sujeewa Vithana	United Energy	Melbourne
John Sligar	Sligar and Associates	Sydney
Marino Bolzon	South Australia Department of State Development	Adelaide
Mike Dargue	Alinta Energy	Teleconference
Herman De Beer	Ausnet Services	Teleconference
Damian Dwyer	Australian Petroleum Production & Exploration Association Limited (APPEA)	Teleconference
Peter Haenke	Australian Renewable Energy Agency	Teleconference
David Whitelaw	Department of Environment and Energy	Teleconference
Katie Filippello	Department of the Environment and Energy	Teleconference
Brad Parker	ElectraNet	Teleconference
Scott Turner	Energy Developments	Teleconference
Craig Pollard	Energy Queensland	Teleconference
Andrew Godfrey	EnergyAustralia	Teleconference
Brent Hudson	Essential Energy	Teleconference
Joanne Dingle	Essential Energy	Teleconference
Naveen Joseph	Jemena	Teleconference
Thanh Bui	Jemena	Teleconference
David Headberry	Major Energy Users	Teleconference
Prasad Tadipatri	NSW Department of Planning an Environment	Teleconference

NAME	ORGANISATION	LOCATION
Trevor Bornstein	Origin Energy	Teleconference
James Googan	Origin Energy	Teleconference
James Cameron	Origin Energy	Teleconference
Steven Rawlins	Powerlink	Teleconference
Jennifer Brownie	Queensland Electricity Users Network	Teleconference
James Bennet	SA Power Networks	Teleconference
Tom Hanselmann	Senvion	Teleconference
Panos Priftakis	Snowy Hydro	Teleconference
Cheng Chen	Snowy Hydro	Teleconference
Steve Meiklejohn	Stanwell	Teleconference
Herath Samarakoon	Tasnetworks	Teleconference
Cherry Wynn	Tasnetworks	Teleconference

1. Welcome and Introductions

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

2. Previous minutes, Action Items and Forward Plan

The meeting minutes from the 12 June 2018 FRG were accepted by attendees and finalised.

Tania McIntyre (AEMO) provided updates on the actions register which are appended to these meeting minutes.

Participants were encouraged to email any suggestions or queries regarding the forward plan to energy.forecasting@aemo.com.au

3. Forecasting Performance Metrics Reporting

Adrian Grantham (AEMO) presented on *Forecast Performance Metrics Reporting* (slides included in the July 2018 meeting pack). The presentation provided an overview of current demand forecast inputs and challenges, the forecast accuracy report and the proposed performance monitoring system.

Discussion generated throughout this presentation demonstrated that a distribution of results is required to adequately capture the effects of the explanatory variables rather than a point estimate. Additionally, the importance of transparency between AEMO and market participants was highlighted with special mention given to proposed rule changes by the Australian Energy Market Commission (AEMC). It was noted that AEMO hosts forecasting methodology workshops with network service providers once every six months and will be looking to expand these forums to all FRG participants (Action 9.3.1).

Key points raised by stakeholders during this presentation included:

- Jennifer Brownie (Queensland Electricity Users Network) suggested that AEMO should consider including consumers using less than 100MWh annually in the surveys sent out. Additionally, it was queried whether AEMO is appropriately capturing the capacity of residential rooftop photovoltaic (PV) given that many panels and inverters

harbour faults. Chris Mock (AEMO) noted that AEMO takes into account solar degradation into its forecasts. Nicola Falcon (AEMO) added that AEMO is currently working to better monitor and understand the performance of rooftop PV through collaboration with institutions such as the Australian Bureau of Meteorology (BOM).

- Stakeholders queried as to how multiple hot days are treated in AEMO forecast model. Daniel Guppy (AEMO) responded that three or more consecutive 'hot' days are treated as a heatwave. A heatwave variable is present in the maximum demand forecast multivariate model.
- Thanh Bui (Jemena) acknowledged that there are many factors included in the maximum demand model and asked what variables could be filtered out to produce a better model. Daniel Guppy (AEMO) noted that a multivariate model is used in maximum demand forecasts. The procedure undertaken with this model involves a series of tests to determine whether variables are statistically significant.
- Jennifer Brownie (QUEN) questioned whether AEMO considers humidity as a significant demand forecast input. Daniel Guppy (AEMO) advised that humidity was included in the suite of variables examined for the maximum demand model. It was found that humidity and heatwaves were highly correlated and the inclusion of both variables in the model caused variance inflation. It was appropriate to drop one. Daniel chose to drop the humidity variable in preference to the heatwave variable.
- Nicola Falcon (AEMO) noted that the delivery of an online data dashboard with aggregated data is expected to be implemented in 2019 to assist with communicating forecast data and metrics to market participants. The dynamic dashboard will aim to provide different layers of complexity to accommodate the various stakeholder requirements. FRG participants were encouraged to email AEMO on their preferred forecasting performance metrics and data for inclusion in the online dashboard (Action 9.3.2).
- Alessio Bonato (AGL) queried whether AEMO can share maximum demand traces. Daniel Guppy (AEMO) responded that due to the data size from thousands of simulations AEMO doesn't not currently persist the data. Further, given the data size if AEMO did persist it would be difficult to share. It would be thousands of orders of magnitude more data than the reference year traces that AEMO currently shares.
- Russell Farmer (EA) acknowledged the difficulty and complexity associated with trying to assess maximum demand performance, and questioned whether attempting to produce an equivalent downscaled model to demonstrate model performance was a value-add activity.
- Richard Paprzycki (EA) sought further clarification on how AEMO includes battery generation and charging in the maximum demand model. Daniel Guppy (AEMO) responded that operational demand takes into account the behind-the-meter battery. Nicola Falcon (AEMO) noted that in the 2018 Electricity Statement of Opportunities (ESOO) batteries are treated differently depending on whether they are assumed to

be charging/discharging at convenience or whether the battery is a part of an aggregation for the wholesale market. Aggregated batteries are not netted off the load as we want to capture their effects.

- Jennifer Brownie (QUEN) raised questions regarding whether AEMO will have forecasting accuracy metrics for minimum demand forecasts. Nicola Falcon (AEMO) advised that minimum demand will be discussed in the upcoming Forecasting Accuracy Report.
- Sujeewa Vithana (United Energy) sought further clarification on whether AEMO can include the estimated POE of the actual maximum demand? Daniel Guppy (AEMO) advised that for the actual MD, it is possible to provide the equivalent POE from the simulated MD distribution for that year.

FRG participants are asked to send further feedback on AEMO forecasting performance and method to energy.forecasting@aemo.com.au (Action 9.3.3)

4. Data Integrity Check Process

Ruchira Ray (AEMO) presented the *Data Integrity Check Process* slides (included in the meeting pack). Discussion points relating to data integrity check included:

- Jennifer Brownie (QUEN) queried how close the large industrial surveys forecast compared to the actuation consumption and if the surveys are broken down into jurisdictions. Ruchira Ray (AEMO) replied that AEMO is currently breaking the surveys down into jurisdictions and in regard to gas forecast, the variation is approximately 4% of loads which is stable in neutral scenario, while the drivers of electricity are also stable. Ruchira noted that large industrial loads forecast are more about long term trends and AEMO take a conservative view when preparing the forecast. Potential closures are more likely to be considered in the weak scenario.
- Nicola Falcon (AEMO) advised that considering the significant role of inputs fed into a forecast, AEMO will start reporting the accuracy of forecast inputs
- Souhaib Ben Taieb (Monash) queried if the process of producing the forecasts is automated, as if highly automated, the data integrity check process becomes increasingly important. Daniel Guppy (AEMO) responded that our forecasting processes are programmatic but are initiated and analysed by analysts. We are looking at what aspects can be automated. Ruchira Ray (AEMO) added that due to the changing landscape, some things cannot be automated and still require analyst judgement.

5. Demand Side Participation – Overview of New Information

Linton Corbet (AEMO) presented *Demand Side Participation (DSP)* and provided an update on submissions via AEMO's new DSP portal (slides included in the meeting pack). Discussion points relating to demand side participation included:

- Alessio Bonato (AGL) sought further clarification of why there is a sudden jump in number of NIMI response from 2017 survey to 2018 survey. Linton and Chris noted it due to the change in selection criteria which includes NMI with time-of-use tariffs and controlled loads. It is noted that AEMO will filter out duplicates and baseline demand and not take the raw numbers from the survey as given.
- Sonja Lekovic (Powercor) asked if AEMO has gone out to 1.6 million consumers for surveys. Linton Corbet (AEMO) clarified that AEMO is working with 272 participants, each with a portfolio of customers, resulting 1.6 million NMIs.
- Alessio Bonato (AGL) queried whether large industrials are included in the NMIs record. Linton Corbet (AEMO) confirmed the inclusion of large industrials and further explained the two different mechanisms applied to residential and industrial loads.
- Sonja Lekovic (Powercor) questioned why there is the assumption of time-of-use tariffs leading to more demand side response. Linton Corbet (AEMO) responded that no such assumption has been made yet. Time-of-use tariffs inclusion is just part of the portal data collection at this stage.
- Peter Haenke (Australian Renewable Energy Agency) asked whether AEMO has prepared the preliminary results of 2018 DSP. Linton Corbet (AEMO) replied it is still a work in progress with substantial work on data cleaning and analysis to be done.
- Sonja Lekovic (Powercor) sought further clarification of the purpose of AEMO work on DSP. Linton Corbet (AEMO) advised that it is to inform the assessment of reliability, such as whether supply issues at time of peak demand are mitigated by demand side participation.

6. Proposed Connection Point Forecast Minimum Demand Forecast Methodology

Hua Min Situ (AEMO) presented *Connection Point Minimum Demand* (slides included in the meeting pack. It is noted that the connection points selected for the development of the minimum demand methodology are based on drivers that could shift overnight minimum demand to a daytime minimum demand.

Stakeholders questioned the characteristics of a connection point to be included in connection point forecast minimum demand model. Hua Min Situ (AEMO) noted that at least one of the included connection points is in a highly residential location and others were selected for having high rooftop photovoltaics (PV) or wind farms. Drivers like PV and wind farms are fairly new with lack of historical data, hence the challenges of projecting those components at a connection point level are also acknowledged.

7. Other Business

Energy Australia acknowledged the replicability of the recent ESOO. Additionally, the following questions were raised as part of 'Other Business':

1. Can AEMO separate the FRG into two different forums – one for demand and one for supply streams?
2. Are the Market Modelling Working Groups continuing to run and when will the next series be scheduled?
3. Will there be further information released for the replication of Integrated System Plan (ISP) and 2018 Electricity Statement of Opportunities (ESOO)?
4. What are the assumptions for generation retirement in the ISP?
5. Should we expect to see a higher ratio of peak demand over average consumption in the forecast?
6. How does AEMO propose to assist market participants in tracking the actual number of residential batteries without relying on a third party?
7. Will supply side metrics contained within the 2018 ESOO be released any time soon?

Nicola Falcon (AEMO) and Chris Mock (AEMO) provided the following responses to the questions above:

1. The FRG is aimed to be open to as many people as possible for the purpose of receiving feedback to enable AEMO to produce the best possible forecasts. It is understood that the term "forecast" should be about demand and supply forecasts which support reliability as the result. Therefore, stakeholders from both supply and demand sides are welcome in the FRG. A forward plan of agenda topics is provided to allow participants to attend sessions most applicable to them. FRG participants are encouraged to send feedback via Energy Forecasting regarding whether they feel that supply and demand forecasts should be discussed in separate forums in future. (Action 9.7.1)
2. A Market Modelling Working Group currently exists however is more focused on Network Service Providers (NSP's). FRG participants are encouraged to email AEMO outlining their preference for having a separate workshop to accommodate needs for supply forecast modelling.
3. Further information to assist with replicating ISP will become available in the future. The information is currently being transformed into a user-friendly version for publication. Models contained within the 2018 ESOO will also be published following its release in August 2018.
4. Generation retirement assumptions are outlined in the ISP assumptions workbook. The generation and transmission outlook is also available in ISP database. Revenue sufficiency was not considered in the ISP, but will be an area of focus in the year ahead.

5. The reflection of high peak demand to average consumption has been discussed in previous FRG meetings with the information available on the AEMO website, and is consistent with the most recent forecasts being developed for the 2018 ESOO.
6. Regarding residential batteries, it is noted that the demand side participation information portal does request residential battery related information. Also, the AEMC recently published a draft Rule for AEMO to establish a register of distributed energy resources in the National Electricity Market (NEM), including residential battery and rooftop PV.
7. 2018 ESOO supply side metrics will be published in August 2018 together with the release of 2018 ESOO.

8. Meeting Close

The next FRG meeting is scheduled for Wednesday 22 August 2018.

Forecasting Reference Group (FRG) Actions Items

Item	Date Raised	Topic	Action required	Responsible	By	Status
9.3.1	26/07/2018	Methodology Workshop	AEMO to advise when forecasting methodology workshops are to occur.	Tania McIntyre	22 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	**Ongoing**
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	**Ongoing**
9.7.1	26/07/2018	Supply and Demand Forecasts	Participants to email AEMO regarding whether supply and demand forecasts should be discussed in separate forums in future.	FRG Participants	22 August 2018	**Complete**