# Forecasting Reference Group (FRG) DRAFT MINUTES

MEETING: FRG #3 2021

DATE: Wednesday, 31 March 2021

TIME: 2:00pm – 5:15pm AEDT

LOCATION: Teleconference

ATTENDEES:

| Name | Company | Name | Company |
|---|---|---|---|
| Ben Skinner | AEC | Candice Hincksman | EnergyQ |
| Lucia Zuniga-Mendoza | AEMC | Ngoc Nguyen Tho | ENET |
| Abbas Mohammadi | AEMO | Kerina Heath | Ergon Energy |
| Adrian Grantham | AEMO | Donovan Marsh | ESB |
| Andrew Turley | AEMO | Brent Hudson | Essential Energy |
| Bella Pennington | AEMO | Mark Grenning | EUAA |
| Cam Potter | AEMO | Fei Qiao | EY |
| Dane Winch | AEMO | Nadali Mahmoudi | EY |
| Daniel Collins | AEMO | David Heard | Finncorn Consulting |
| Daniel Guppy | AEMO | Tristan Edis | GEM |
| Dean Soste | AEMO | Christina Sutherland | GLNG Operations Pty Ltd |
| Gregory Staib | AEMO | Mohammad Alipour | Griffith University |
| Helen Wang | AEMO | Mick Fell | Hanwha Q Cells |
| Levi Rosenbaum | AEMO | Devvrat Patney | Hydro Tasmania |
| Luke Dowling | AEMO | Kate Farnsworth | Hydro Tasmania |
| Magnus Hindsberger | AEMO | Tahlia Nolan | Infigen |
| Milton Woods | AEMO | Andrew Nance | ISP Consumer Panel |
| Nicola Falcon | AEMO | Richard Owens | ISP Consumer Panel |
| Shahzad Billimoria | AEMO | Brent Davis | Jemena |
| Shayne D'Lima | AEMO | David Headberry | Major Energy Users |
| Vivian Mai | AEMO | Alan Love | Meridian Energy |
| Adam Day | AER | Jeff Jamieson | MMtechnology |
| Ashok Kaniyal | AER | David Havyatt | NICE |
| Craig Oakeshott | AER | Reinzy Colle | NSW DPIE |
| Mustafa Kaka | AEMC | Sharon Young | NSW DPIE |
| Alessio Bonato | AGL Energy | Sarah-Jane Derby | Origin |
| Chrys Chandraraj | Alinta Energy Pty Ltd | Erin Stone | Point Global |
| Ed White | Ausgrid | Geoff Dutaillis | Powering Australian Renewables |
| Marc Thiebaut | Ausgrid | Dean Knight | Powerlink |
| Navid Haghdadi | Ausgrid | Enrique Montiel | Powerlink |
| Morteza Moallemi | Ausnet | Jared Rodell | Powerlink Queensland |
| Nick Cimdins | AusNet Services | Bret Harper | RepuTex |

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|---|---|---|---|
| Saliw Cleto | AusNet Services | James Tin | RES Australia Pty Ltd |
| Zeno Atherton | CEFC | Marino Bolzon | SA DEM |
| Sonja Lekovic | CitiPower Powercor United Energy | Bryn Williams | SA Power Networks |
| Geoff Houen | Clean Energy Regulator | Elisia Reed | SA Power Networks |
| Jayanthi Thennakoon | Clean Energy Regulator | Steve Fraser | SA Power Networks |
| Gavin Dufty | Consumer panel / Vinnies | Matt Napolitano | SA Power Networks |
| Henry Gorniak | CS Energy | Ron Logan | Shell Energy Australia |
| Brian Spak | CSIRO | Noel Sligar | Sligar and Associates |
| Paul Graham | CSIRO | Jean Dussaubat | Solar Victoria |
| Alice Moore | DELWP | Joe Hemingway | Stanwell |
| Andrea Espinosa | DELWP | Sharon Raymond | TAS State Growth |
| Tristan Anderson | DISER | Herath Samarakoon | TasNetworks |
| Alex Driscoll | Edge2020 | Julie Morrison | TasNetworks |
| Abu Abdullah | ElectraNet | Prateek Beri | TasNetworks |
| Connor McLeod | Enel Green Power | Arindam Sen | TransGrid |
| Bo Xu | Energeia | Gang Cao | TransGrid |
| Shervin Mohebbi | Energy Queensland | Sujeewa Vithana | United Energy |
| Patrick Gan | EnergyAustralia | Catherine Laurie | VIC DELWP |

## 1. Welcome and Introductions

Daniel Collins (AEMO) welcomed everyone and covered the following:

- Open Actions
- Asked for feedback on the Feb 2021 minutes to be provided by 2 April 2021.
- Open Formal consultations on:
  - Electricity Demand Forecasting Methodology Consultation. Second stage submissions close 15 April 2021. (Action 5.1.2)
  - FRG Consultation on draft PV, Batteries and Electric Vehicle Forecasts. Submissions close on 14 April 2021
- Demand Side Participation Information portal opening from 31 March 2021 to 30 April 2021
- Submissions to Energy.forecasting@aemo.com.au are appreciated.

## 2. Presentation 1 – Connections and Retail Price Forecasts

Greg Staib (AEMO) and Luke Dowling (AEMO) presented AEMO's 2021 Connections and Retail Price methodologies and draft forecasts, including the implementation of consultant forecasts.

Key topics raised by stakeholders during this session included:

- David Headberry (MEU): Does AEMO use the most recent data for economic related forecasts, including housing and connection forecasts?
  - AEMO: Long term forecasts are based on BIS Oxford Economics' (BIS OE) long term projections, using Australian Bureau of Statistics (ABS) household data. Short term forecasts use AEMO's frequently updated National Meter Identifier (NMI) growth data. Industrial growth is forecast elsewhere.
- Ron Logan (Shell Energy Australia): When are COVID related decisions expected to impact housing?
  - AEMO: Recent ABS data highlights housing construction has grown strongly suggesting that COVID impacts on new dwellings has been positive – in part due to government support and low interest rate.

        - Nick Cimdins (AusNet Services): Networks are seeing a 12 month lag from application to connection, indicating strong sustained growth.
    - Richard Owens (ISP Consumer Panel): Forecasts from The Australian Energy Market Commission (AEMC) are limited compared to the ISP modelling spread and timeframe. More detail on how government policies are applied to scenarios is required.
        - AEMO use long term wholesale price and transmission outlooks to complement AEMC data. The Inputs, Assumptions and Scenarios Report (IASR) will detail how these are integrated across various complex forecasting models.
    - Craig Oakeshott (AER): How are connections applied to more aggressive scenarios?
        - AEMO: In the strong economic scenarios, Australia becomes more appealing, this increases population and immigration, driving higher connections.
    - Arindam Sen (TransGrid): What price elasticities of demand is used?
        - AEMO: The average elasticity, derived from literature as -0.1, is more heavily weighted to extreme temperature days. Related forecasts include energy efficiency and appliance and fuel switching, to be discussed in April's FRG.

## 3. Presentation 2 – Draft 2021 DER (PV and Battery) Forecasts – Green Energy Markets (GEM)

Tristan Edis (GEM) presented GEM's draft DER forecasting methodology, assumptions and forecasts, to be used as an input in AEMO's IASR, Integrated System Plan (ISP) and Electricity Statement of Opportunities (ESOO) modelling. The presentations included the main differences since 2020.

Key topics raised by stakeholders during this session included:

- Steve Fraser (SAPN): What ceiling values and saturation points are considered?
    - GEM: The ultimate saturation point is the annual demand of the entire grid. This will depend on future storage and hydrogen levels. Current PV forecasts are far below, at approximately 40%.
- Sharon Young (NSW DPIE): What drives Slide 5's drop in annual PV MW capacity?
    - GEM: Payback is expected to fall due to lower feed in tariffs and dwindling government rebates.
- Geoff Houen (Clean Energy Regulator): DER has been continually underestimated in the past few years; forecasts should consider continued strong consistent growth.
    - GEM: Feed in tariffs are forecast to drop significantly, seriously decreasing long term investment decisions following a short term lag period.
- Joe Hemmingway (Stanwell):is the premium on feed-in tariffs applied consistently over the long term? Why are retailers providing such relatively high feed in premiums and should there be a correction at some point?
    - GEM: the premium assumption is carried through the forecasts for the full period. FITs are not declining at the level we have previously assumed and there is a wide range of retailers adding this premium. It is not completely clear to us why retailers do this, it may be that they are getting the margin back via other means, but unless we are provided with a basis for why this retailer behaviour will not continue we are inclined to keep it in the model.
- Patrick Gan (Energy Australia): How are PV system replacements forecast?
    - GEM: Systems are currently assumed to be replaced every 10-20 years. NMIs are checked for duplicate installations, indicating replacements.
- Bryn Williams (SAPN): How do battery load profiles change with new technology uptake over time?
    - GEM: Modelling constraints requires consistent load profiles. Higher growth scenarios include new technology uptake and quicker payback periods without load shape changes.

## 4. Presentation 3 – Draft 2021 DER and Electric Vehicle (EV) Forecasts – CSIRO

Paul Graham (CSIRO) presented CSIRO's draft DER and EV forecasts, to be used as an input in AEMO's IASR, ISP and ESOO modelling, including the main differences since 2020.

Key topics raised by stakeholders during this session included:

- Steve Fraser (SAPN): Are forecasts disaggregated from NEM level to state level?
  - CSIRO: Forecasts are aggregated from postcode level, capturing local trends.
- Patrick Gan (Energy Australia): How large is the proportion of NSW PV installations?
  - CSIRO: NSW has been behind in adoption and have further to grow. VIC is expected to grow most due to existing government policies and incentives.
- Steve Fraser (SAPN): Has the PV degradation methodology been revised?
  - CSIRO: Negative PV output growth are possible if installation growth is below degradation rates, set based on literature. Battery degradation rates requires further research.
- Joe Hemmingway (Stanwell): What are the main long term PV installation drivers?
  - CSIRO: The report details assumptions around the rate of decline in subsidies, cost of solar, roof space, house ownership and their impacts on long term installations.
- Ron Logan (Shell Energy Australia): Time Of Use (TOU) tariff timings shown on graphs seem to be two hours early.
  - CSIRO: The time of use peak period varies between 9pm and 10pm depending on the distribution zone.
- Craig Oakeshott (AER): Do falling PV export tariffs incentivise battery uptake?
  - CSIRO: Export tariffs are part of battery payback and uptake calculations.
- Shervin Mohebbi (Energy Queensland): How many short term, expensive, battery installations are expected?
  - CSIRO: The high end of short term projections has been revised down.
- Jayanthi Thennakoon (Clean Energy Regulator): Does the PV model include positive impacts from COVID and increased working from home?
  - CSIRO: These are included in current trends in the short term model.
  - CSIRO: COVID impacts of lower population growth and reduced vehicle use have been considered in the EV model.
- Gavin Dufty (Vinnies): Do household PV and Battery forecasts flow to EV charge profiles and electrification forecasts?
  - CSIRO: Modelling constraints prevent these considerations.
- Ron Logan (Shell Energy Australia): What drives different short range Electric-fuel vehicle parity point projections?
  - CSIRO: Australia being a vehicle importer, with no domestic emission standards and flat to falling conventional vehicle costs, causes uncertainty in cost parity timing. This uncertainty is captured as a spread across scenarios.
- Steve Fraser (SAPN): Infrastructure for hydrogen vehicles is available through refitting existing petrol stations. Will government policies be the main driver in the uptake of hydrogen vehicles?
  - CSIRO: There is an upside in hydrogen vehicles, but it is only implemented slightly in the export superpower scenario.
- Bryn Williams (SAPN) How will GEM and CSIRO forecasts be weighted by AEMO?
  - AEMO: Slide 12 of Presentation 1 shows how AEMO approach the two forecasts in different scenarios.
- Richard Owens (ISP Consumer Panel): Can AEMO please clearly explain the differences between GEM and CSIRO's forecasts.
  - AEMO will endeavour to outline where the input assumptions match. However, differences in methodology may result in some differences between forecasts that cannot be fully interpreted, and reference should still be made to GEM and CSIROs perspective reports.

## 5. Presentation 4 – Review of 2020 maximum and minimum demand

Adrian Grantham (AEMO) presented a review on the accuracy of AEMO's 2020 Electricity Statement of Opportunities (ESOO) maximum and minimum demand forecasts. Actual maximum and minimum summer demand was on the lower end of the distribution for all states, given the impact of La Niña weather characteristics.

Key topics raised by stakeholders during this session included:

- Steve Fraser (SAPN): Will La Niña now be included in all future ESOO Probability Of Exceedance (POE) forecasts?
  - AEMO: Yes. With the 2020/21 summer included, the model will now capture more weather events to better reflect climate for each region.
- Herath Samarakoon (TasNetworks): Tasmanian numbers seem wrong.
  - AEMO: Tasmania is "TBC" in slide 4 and has '*' in slide 5.
- Arindam Sen (TransGrid): Is temperature the main driver of max and min demand?
  - AEMO: Temperature, both instantaneous and heatwaves, is a main driver, but there are many other "stars" that need to align, including behavioural aspects in prolonged heatwaves.
- Nick Cimdins (AusNet Services): Have other COVID impacts, besides lockdowns, been analysed?
  - AEMO: Other COVID impacts were not significant for the maximum and minimum demand events for this presentation.

## 6. Other Business

Key topics raised by stakeholders during this session included:

- David Headberry (MEU): Have the IASR scenarios been finalised?
  - AEMO: Consultation submissions have closed. A determination will be released prior to the final Inputs, Assumptions and Scenarios Report (IASR).
- Joe Hemmingway (Stanwell): PV forecasts seem bullish and unrealistic. Can more detail be provided for this regarding how low Minimum demand can be?
  - AEMO: For the ESOO, it is important to understand how low min demand could be without intervention, to inform decision makers of what may need to change to sustain system stability.

## 7. Meeting close

The April FRG will be split in two meetings:

1. Wednesday 28 April 2021 with presentations on:
   - Final PV, Battery and EV forecasts
   - Energy Efficiency forecasts

2. Wednesday 5 May 2021 with presentations on:
   - Large Industrial Loads (LIL)
   - Electrification of other sectors
   - Appliance Index and fuel switching

## Appendix A Forecasting Reference Group (FRG) Actions Items

### FRG Action Items – OPEN (as at 21 March 2021)

| Item | Date Raised | Topic | Action required | Responsible | Due | Status |
|---|---|---|---|---|---|---|
| 5.1.3 | 27/1/2021 | Engage with Energy Australia regarding Daily Gas forecasts | AEMO to reach out to Energy Australia to provide information on how available data can be used by participants for daily forecasts. | AEMO | Work in progress to identify a path forward to aggregate confidential data | In Progress |

### FRG Action Items – CLOSED (as at 21 March 2021)

| Item | Date Raised | Topic | Action required | Responsible | Details | Status |
|---|---|---|---|---|---|---|
| 5.1.2 | 16/3/2021 | Electricity Demand Forecasting Methodology Consultation | Second stage submissions to RFG Consultation sent to energy.forecasting@aemo.com.au | AEMO | Final Determination due on 27 May 2021 | CLOSED |