

# Forecasting Reference Group Minutes

**Forum:** April FRG 2023 (#2)

**Date & Time:** Wednesday 26 April 2023, 2:00pm – 4:10pm AEST

## Disclaimer

*This document provides an overview of the main points of discussion on the April 2023 Forecasting Reference Group (FRG) meeting agenda.*

*Readers, please note that:*

- *This document is a summary only and is not a complete record of discussion at the forum.*
- *For presentation purposes, some points have been grouped together by theme and do not necessarily appear in the order they were discussed.*
- *The views expressed at the forum and reflected here are not necessarily those of AEMO.*

## 1 Welcome and Introductions

Levi Rosenbaum (AEMO) welcomed everyone and covered the following:

- Consultation on updates to the ISP Methodology is ongoing.
- Draft 2023 Transmission Expansion Options Report to be published 2 May.
- Final Reliability Forecasting Guidelines and Methodology published 24 April.
- Submissions for ESOO Short Duration Storage Methodology close 10 May.
- Upcoming engagement on 2023 IASR scenarios.
- Submissions can be made to [Energy.forecasting@aemo.com.au](mailto:Energy.forecasting@aemo.com.au).

## 2 Presentation 1 – 2023 ESOO Short Duration Storage Methodology

Phil Travill (AEMO) presented on the proposed methodology for short duration storage forecasts in the 2023 Electricity Statement of Opportunities (ESO). Phil compared the current methodology and proposed updates through forecast accuracy. These changes mirror those proposed for the 2024 Integrated System Plan (ISP) Methodology update consultation<sup>1</sup>, including a 50% derating factor for the shallowest storage devices.

Written submissions to this FRG Consultation were open until 10 May 2023.

Key topics raised by stakeholders during this session included:

- Stakeholders sought clarity for some of the presented figures in the slides:
  - Slide 5 shows battery generation profile against price and demand, for a high price 2022-23 summer day in Victoria.
  - Slide 6: The left chart shows the average maximum power dispatched by batteries in Victoria, above various price thresholds, in 2022-23 summer. The right chart shows the frequency of large-scale battery energy discharge, at maximum capacity.
- Craig Tupper (Ausgrid): Available capacity of smaller batteries is 50-60% of nameplate capacity, while large batteries have different controllable capacity and should be modelled differently. Will the derating apply to nameplate or effective capacity?
  - AEMO: Derating is applied to nameplate capacity.
- Craig Tupper (Ausgrid): Can longer duration batteries better predict price events?

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<sup>1</sup> Available at: <https://aemo.com.au/consultations/current-and-closed-consultations/consultation-on-updates-to-the-isp-methodology>

- AEMO: AEMO is not proposing that longer duration battery operators have better foresight, however longer duration batteries store more energy and are therefore more likely to have energy available to enable operation during key dispatch opportunities such as potential Unserved Energy (USE) periods.
- Ron Logan (Shell): Has AEMO done any analysis on how much storage needs to be reserved for provision of Frequency Control Ancillary Services (FCAS)?
  - AEMO: No detailed FCAS requirement analysis has been done.
- Ron Logan (Shell): Storage levels are high just prior to peak evening demand; however, batteries may choose to reserve energy in case high prices eventuate. Has AEMO analysed storage levels to determine the price thresholds for battery dispatch in a reliability situation?
  - AEMO: Analysis concluded that storage levels are generally sufficient at peak times and that there remains a risk that the actual discharging of storages may not be perfectly optimal to achieve energy market outcomes, rather than participant portfolio outcomes. The proposed methodology would allow AEMO to better represent available discharge in AEMO's reliability forecasting models without needing to factor all business motives for each operator.
- Ron Logan (Shell): The analysis is good, but more questions need to be answered to choose a more informed derating. 50% derating is high. When conditions are right, batteries will dispatch more as there is unlikely to be many consecutive high price trading intervals.
  - AEMO: Some batteries did bid capacity at the market cap, suggesting they would have participated at 100% capacity if market conditions would have prevailed. The choice to derate the energy, rather than the discharge capacity, is to ensure the models best capture the dispatch capabilities to capture high price events (at times of reliability risk or generally).
- Cameron Potter (FFI): A 10-20% derating seem to substantially over-estimate the actual behaviour identified in Slide 6, which shows battery dispatch at less than 50% of maximum power even at high prices. Why was 50/20/10% chosen?
  - AEMO: Slide 6 shows analysis from 5 min dispatch data, while ESOO modelling is at 1-hour intervals. Only extreme price conditions would cause the same discharged power for the entire hour. Therefore, the derating factors are lower than observed.
  - AEMO: The proposed approach for ISP and ESOO derates battery energy (MWh) to address intra-day forecast inaccuracy. An alternate approach is to derate battery discharge capacity (MW), as suggested by recent storage behaviour.
    - Cameron Potter: Derating MW is more appropriate.
- Paul Graham (CSIRO): A hybrid approach should model a price threshold over which the batteries can dispatch at 100% power using the otherwise reserved capacity. This ensures that the ESOO won't overestimate the propensity for USE situations.
- Craig Tupper (Ausgrid): Have you talked to these market participants?
  - AEMO: Yes, there were several confidential meetings to understand the reasoning for battery behaviour, but this consultation is to allow all stakeholders to be involved.

### 3 Presentation 2 – Forecasting Improvement Plan update

Nick Cimdins (AEMO) presented an overview of how AEMO is tracking with the initiatives outlined in the 2022 Forecast Improvement Plan (FIP).

Key topics raised by stakeholders during this session included:

- Brent Hudson (Essential Energy): Is the Large Industrial Load (LIL) forecasts issue related to timing or the load values assumed? Essential Energy finds that the actual load used is less than proponent forecasts.
  - AEMO: The issue relates to both timing and load size, which can be interrelated. Outages were a big driver for forecast deviations.
- Ron Logan (Shell): Did the analysis for wholesale demand response (WDR) on Slide 14 go until the Market Price cap?
  - AEMO: Yes, the highest price category is \$10,000 - \$15,500.
- Ron Logan (Shell): Has AEMO reached out to WDR participants to understand their cost structure and other non-price trigger considerations?
  - AEMO will talk to the WDR explore this. (Action 1)
- Caroline Valente (ECA): In addition to estimating behavioural change impacts on consumption profiles from consumer energy resources, will AEMO also conduct analysis of impacts from cost-reflective and TOU tariffs?
  - AEMO: Yes. Significant impacts from cost-reflective tariffs have not yet been observed, but this will be continually monitored.

#### 4 Presentation 3 – Synthetic Demand traces

Magnus Hindsberger (AEMO) presented background and a status update for the synthetic demand traces project, Initiative #1 from the 2022 Forecasting Improvement Plan. The presentation included promising initial results.

Key topics raised by stakeholders during this session included:

- Mark Kowalczyk (VIC DEECA): Does AEMO plan to correlate mainland hydro storage and flows to La Nina and El Nino events? This can be through a hydro generation constraint, when selecting demand traces with dry year conditions.
  - AEMO: Currently hydro availability is based on historically observed water availability, which align with the availability of wind, solar and forecast demand. The 2023 EAAP (part of 2023 ES00) will report on low water conditions and hydro availability.
- Joe Hemingway (Powerlink): Could AEMO look further back in time to examine years with higher reliability risk periods, and use these to represent more feasible outcomes?
  - AEMO: Good weather data will allow good modelling, but high-quality solar data is only available from 2007. BOM and CSIRO have been running backward-looking climate models to create better data series for all weather variables. AEMO is already using such data for wind generation and will review if it potentially could be used for solar generation as well in order to include more historical years in the reliability assessment.
- Caroline Valente (ECA): Besides temperature and humidity, air quality index may be a useful input for demand, particularly as people start to use air conditioners to improve indoor air quality, as observed post COVID-19 and from bushfire events.
  - AEMO: This highlights the fact that older demand years do not represent the way in which people use electricity evolves over time.
- Ron Logan (Shell): There are lots of assumptions involved in building synthetic traces. What will be the transparent and well-defined consultation process to audit these?
  - AEMO: AEMO will consider the consultation steps that will be needed at each decision stage to ensure a transparent approach is taken. Creating synthetic traces does not require many additional inputs, other than weather data from more historical years.

- Ron Logan (Shell): Why do synthetic demand traces if you still need scaling to POE10 and POE50? the longer history of weather years should capture the range of potential outcomes.
  - AEMO: Consumer demand is uncertain for each weather outcome, so probability distribution is applied. POE10 and 50 are selected because these weightings produce accurate estimates of USE outcomes.
- Ron Logan (Shell): POE30 traces should be considered, as weighting for POE10 is statistically too high. Will there be scope for revision to other aspects of the process, alongside the synthetic traces?
  - AEMO: This scope is currently focused on producing compatible synthetic demand, wind and solar traces.
- Ron Logan (Shell): Will analysis include demand ramp rates both up and down?
  - AEMO: The impact of time of day on ramping, both up and down, will be considered.
- Ron Logan (Shell): A 1.88 mean absolute percentage error (MAPE) represents 170 MW on a 9,000 MW peak demand day. If conservative, this could be material for a USE forecast perspective and should be conveyed.
  - AEMO: Agreed. MAPE is the difference between the model and historical data. The MAPE is used to create a residual function that can pull the forecast up or down. Checks will be performed on whether the outcome is accurate with respect to the size, shape, number of peaks, and ramping.
- Mark Kowalczyk (VIC DEECA): Why is wind speed separated from demand trace inputs? Will correlations between solar irradiance and wind be included?
  - AEMO: The diagram in Slide 7 shows that solar irradiance is directly accounted for in producing PV traces used for rooftop PV, which affects the operational demand, which was the focus of the slide. AEMO will ensure traces for large-scale solar and wind apply consistent weather patterns as the ones for demand once applied in system modelling, to ensure consistency.

## 5 Meeting close

The next FRG meeting will be held on 31 May 2023 with presentations on ESOO consumption forecasts, and Demand Side Participation forecasts. Visit the [FRG webpage](#) for the forward plan of agenda topics for 2023.

Feedback on the April FRG can be provided via: <https://forms.office.com/r/dX5eZXmxu9>

# A1 Attendees:

**Table 1 April FRG Attendees**

Name	Organisation	Name	Organisation
Ana Orozco Perez	AEMO	Caroline Valente	ECA
Andrew Turley	AEMO	Amjad, Shoaib	Energy Australia
Anula Abeygunawardana	AEMO	Lawrence Irlam	Energy Australia
Ben Jones	AEMO	Richard Paprzycki	Energy Australia
Chang Liu	AEMO	Kerina Heath	Ergon
Deborah Marsh	AEMO	Brent Hudson	Essential Energy
Eduard Munsayac	AEMO	Mary Boryslawska	Essential Energy
Jay Stein	AEMO	Cameron Potter	FMGL
Jieyang Chong	AEMO	David Edwards	Horizon Power
Jin Han Lim	AEMO	Anna Matala	Hydro Tasmania
John Liang	AEMO	David Allen	Hydro Tasmania
Kristine Cruz	AEMO	Jack Munro	iberdrola
Leo Ma	AEMO	Jay Gordon	IEEFA
Leslie Lay	AEMO	Christian Suprijatna	Jemena
Levi Rosenbaum	AEMO	Pranav Deshpande	NSW DPIE
Lin Han	AEMO	David Xu	Origin Energy
Maggie Du	AEMO	Sarah-Jane Derby	Origin Energy
Magnus Hindsberger	AEMO	Frank Peylaire	P360
Nick Cimdins	AEMO	Aaron O'Brien	Powercor
Phil Travill	AEMO	Shervin Mohebbi	Powercor
Rachael Lim	AEMO	Dean Knight	Powerlink
Reinzy Colle	AEMO	Joe Hemingway	Powerlink
Sayani Gupta	AEMO	Linda Yu	QLD EPW
Seb Kilborn	AEMO	Paul Connor	QTC
Siobhan Attwood	AEMO	Marino Bolzon	SA DEM
Sreeparna Saha	AEMO	Brady Martin	SAPN
Tim Abernethy	AEMO	Elisia Reed	SAPN
Tristan Smith	AEMO	Fraser Hampton	SAPN
Virginia Chen	AEMO	Ron Logan	Shell Energy
Yee Siong Lee	AEMO	Noel Sligar	Sligar and associates
Dominic Price	AEMO Services	Amir Azmi	Stanwell
Monami Das Gupta	AER	Yuichi Yano	Synergy
Craig Tupper	Ausgrid	Dhor Ngor-Apuol	Tas Networks
Ed White	Ausgrid	Herath Samarakoon	Tas Networks
Navid Haghdadi	Ausgrid	Julie Morrison	Tas Networks
Jacob Hyslop	CEC	Sharon Raymond	TAS RECFIT
Ramon Sa	CEFC	Markus Wagner	University of Adelaide
Swaantje Grunefeld	CleanCo QLD	Arwin Kahlon	VIC DEECA
Ben Tudman	Cornwall Insight	Cory Jemison	VIC DEECA
Paul Graham	CSIRO	Mark Kowalczyk	VIC DEECA
Ali Bahramzadeh	DCCEEW	Taryn Gale	VIC DEECA
Charlwood, David	DCCEEW	Cara Smith	Western Power
Lucienne Burnham	DCCEEW	Iain Machanick	Western Power
Whitehead, Glen	DCCEEW	Neethu Neethu	Western Power

## A2 Forecasting Reference Group (FRG) Actions Items

**Table 2** FRG Action Items (at 15 August 2023)

Item	Date Raised	Topic	Action required	Closing comments	Status
1	26/04/2023	WDR forecasting	AEMO to talk to the WDR provider about its forecasting approach	AEMO has validated with the WDR provider that the approach is fit for purpose.	CLOSED