Forecasting Reference Group Minutes

Forum:	28 September 2022 FRG (#8b)
Date:	Wednesday 28 September 2022
Time:	2:00pm – 4:30pm AEST

Attendees:

Name	Organisation	Name	Organisation
Abbas Mohammadi	AEMO	Anthony Hill	ETSI
Andrew Turley	AEMO	Cam Potter	FFI
Ben Tudman	AEMO	Ric Brazzale	GEM
Chang Liu	AEMO	Tristan Edis	GEM
Daniel Collins	AEMO	Alanna Gibson	GLNG
Debborah Marsh	AEMO	Amin Nabipour	Horizon Power
Gerry Devereux	AEMO	David Edwards	Horizon Power
Helen Wang	AEMO	Luke Dowling	Horizon Power
Kent Hahn	AEMO	Kat Kiemele	Hydro Tasmania
Lawrence Chan	AEMO	Johanna	IEEFA
Leslie Lay	AEMO	Eddy Buckovic	iiNet
Levi Rosenbaum	AEMO	Craig Memery	ISP Consumer Panel
Maggie Du	AEMO	Jo De Silva	ISP Consumer Panel
Magnus Hindsberger	AEMO	Mark Grenning	ISP Consumer Panel
Natasha Sinclair	AEMO	Mark Henley	ISP Consumer Panel
Oliver Derum	AEMO	Chotima Micallef	Lochard Energy
Sandy Ng	AEMO	Penny Ling	Metro Power
Sayani Gupta	AEMO	Richard Hickling	Mott Mac
Tim Abernethy	AEMO	Chris Cook	NOPTA
Elsie Zhao	AGIG	Dean Knight	Powerlink
Mark Riley	AGL	Aaron O'Brien	Powercor
Navid Haghdadi	Ausgrid	Jennifer Brownie	QEUN
Scarlett Jiang	Ausgrid	Linda Yu	QLD EPW
Morteza Moallemi	AusNet Services	Bret Harper	ReputTex
Anna Freeman	CEC	Marino Bolzon	SA DEM
Sam Ingram	CleanCo Qld	Elisia Reed	SAPN
Chathurika Mediwaththe	CSIRO	Erin Hart	SAPN
David Green	CSIRO	Ron Logan	Shell
James Foster	CSIRO	Noel John Sligar	Sligar and Associates
John McKibbin	CSIRO	Joe Hemingway	Stanwell
Paul Graham	CSIRO	Rudy Khong	Stanwell
Aoife Kane	DISER	Alex Uchanski	Synergy
Geoffrey Brett	DISER	Jill Trinh	Synergy
Glen Whitehead	DISER	Shin Xie	Synergy
Kim Collins	DISER	Sharon Raymond	Tas Treasury
Lucienne Burnham	DISER	Dhor Ngor-Apuol	TasNetworks
Matt Stocks	DISER	Herath Samarakoon	TasNetworks
Oiyu Yeung	DISER	Julie Morrison	TasNetworks
Zakieh Khorshidi	DISER	Mohammad Abdullah	TransGrid
Brian Spak	ECA	Sujeewa Vithana	United Energy
Caroline Valente	ECA	Adam Casey	VIC DELWP
Dennis Van Puyvelde	ENA	Catherine Laurie	VIC DELWP
Dor Son Tan	ENA	Taryn Gale	VIC DELWP
Lawrence Irlam	Energy Australia	Will Clarke	VIC DELWP
Shoaib Amjad	Energy Australia	Marcel Tripolone	WA DMIRS
Dean Comber	Energy Queensland	Ying Huang	WA DOT
Sandy Xu	Engie	Fadiel Ahjum	WA DWER
Brad Smart	EPWA	Bijoy George	Western Power
Kerina Heath	Ergon	Iain Machanick	Western Power
Jill Cainey	Erne Energy	Jillian Reid	Western Power
Brent Hudson	Essential Energy	Laurenz Ramdohr	Western Power

Disclaimer

This document provides an overview of the main points of discussion on the agenda for the 28 September Forecasting Reference Group meeting, including draft 2022 DER and Electric Vehicle (EV) forecasts for use in the draft 2023 Inputs, Assumptions and Scenarios report (IASR)[1].

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

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

- Draft FRG Minutes will be distributed when ready
- Submissions to Energy.forecasting@aemo.com.au are appreciated.

2 Presentation 1 – Draft 2022 DER forecasts – CSIRO

Paul Graham (CSIRO) presented CSIRO's draft 2022 DER forecasts, providing an overview of PV uptake, battery uptake and charge profile forecasts and how they have changed since 2021.

Key topics raised by stakeholders during this session included:

- Craig Memery (ISP Consumer Panel): Are supply chain constraints included into the future?
  - CSIRO: AEMO's scenarios include a spread for supply chain constraint longevity. An extra dispersion is added to the short term regression in the DER model. This could be considered further to better reflect uncertainties.
- Joe Hemmingway: Does *Progressive Change* reasonably reflect the worst case scenario for supply chain constraints?
  - CSIRO: This topic will be further considered.
- Mark Grenning (ISP Consumer Panel): What assumptions are made for battery raw material availability?
  - CSIRO: In the long term, the materials will be made available by market mechanisms. But the period of short term uncertainty can be considered further.
- Ron Logan (Shell): Do the assumptions for home batteries include government subsidies?
  - CSIRO: The 2021 forecast included more arbitrary subsidies to anticipate future policies. Most of these have been removed for 2022, since most state subsidies have expired. The ongoing Victorian subsidy scheme is included.

[1] 2021 IASR supporting material, including 2021 DER and EV reports are available under "supporting material for 2021" at: https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/2022-integrated-system-plan-isp/current-inputs-assumptions-and-scenarios

- Craig Memery (ISP Consumer Panel): Have Time of Use tariff (TOU) assumptions been checked against Distribution Network Service Providers (DNSP) plans?
  - CSIRO: Network plans will be discussed in the final DER forecast report. The TOU proportion grows in the short to medium term, but shifts to Virtual Power Plants (VPP) structures in the longer term.
  - Craig Memery: Coincident peaks in wholesale and network costs should increase the case for TOU.
- Cam Potter (FFI): What drives the residential choice to join a VPP if the economic benefit is not better than a standalone battery?
  - CSIRO: The higher scenarios forecast significant amounts of home batteries in the long term. Once the batteries exist, using them in VPPs to help the grid will be beneficial to both parties. VPP trials have been promising.
- Ron Logan (Shell): What drives the higher limit level for rooftop PV in *Hydrogen Export*?
  - CSIRO: Higher scenarios assume that existing barriers will be overcome more easily, including PV installations on apartments. This is explained in the 2021 report.
- Dennis Van Puyvelde (ENA): Does *Hydrogen Export* have higher battery uptake due to a tighter carbon budget compared to other scenarios?
  - CSIRO: *Hydrogen Export* reflects a world with stronger carbon ambition, leading to faster uptake and cost reductions for PV and batteries.
- Cam Potter (FFI): Has the potential push to address modern slavery concerns, and increasing solar PV prices, been considered?
  - CSIRO: Price projections from GenCost captures tight demand markets, and short term supply constraints. A long term increase in the material costs for PV is not considered.
- Jo De Silva (ISP Consumer Panel): Utility scale Variable Renewable Energy will require more grid investment than DER. How much do the DER projections impact transmission builds?
  - AEMO: Behind-the-meter investments will influence the required utility scale investments, but the extent is unknown. The 2022 ISP explores these sensitivities.

3 Presentation 2 – Draft 2022 DER forecasts – Green Energy Markets (GEM)

Tristan Edis (GEM) presented GEM's draft 2022 DER forecasts, providing an overview of PV and battery uptake and charge profile forecasts and how they have changed since 2021.

Key topics raised by stakeholders during this session included:

- Daniel Colins (AEMO): How do supply chain issues impact GEM's 2022 draft forecasts?
  - GEM: Residential battery prices have not fallen in recent years, but manufacture costs have. Supply chain issues cause a longer "short term" than in 2021, with the high market price persisting, longer in *Progressive Change* than other scenarios. In the longer term, supply meets demand and the market price reflects reduced manufacturing costs.
- Ron Logan (Shell): Does the scenario spread consider home battery costs not declining?

- GEM: No. As per GenCost, long term residential battery prices fall in line with manufacturing costs, just as PV did in the 2000s. The cost per kw/h in EVs is already declining.

- Brian Spak (ECA): Will distribution network export limits be considered for the 2024 ISP?
  - GEM projections include a general curtailment, through reduced payback closer to capacity.
  - CSIRO reduces the maximum export over time due to market crowding, reducing payback.
  - AEMO: AEMO is working with Energy Networks Australia (ENA) to consider network limits. Research in this space is also underway from RACE for 2030[2] and C4NET.
  - Brian Spak: Presenting this research at future FRG meetings will be beneficial.
- Mark Henley (ISP Consumer Panel): Are community batteries considered viable? Will they benefit households who cannot install PV?
  - GEM: Community batteries do not provide any additional financial incentive over the wholesale market arbitrage opportunity of household batteries. Therefore, they will not be viable unless networks subsidise their use to compensate for avoided network investments. Regarding rental properties, DER is assumed to penetrate the rental market through housing turnover.
- Brad Smart (EPWA): Will battery-only properties, without PV installation become viable?
  - GEM: The model focuses on storage with PV since its payback is superior.
- Brad Smart (EPWA): Please publish SWIS data separately to the NEM data.

4 Presentation 3 – Draft 2022 Electric Vehicle (EV) forecasts – CSIRO

Paul Graham (CSIRO) presented CSIRO's draft 2022 EV forecasts. The presentation provided an overview of EV forecasts, focusing on changes since 2021.

Key topics raised by stakeholders during this session included:

- Ron Logan (Shell): What proportion of EVs are assumed to be at home during the day?
  - CSIRO: Day profiles include cars parked at all chargers, not only at home. Initially this is very low, with most drivers assumed to use convenience charging, but increases in the future to around 10% as public charging becomes more available. The report will include more details on this topic, and the trials where these assumptions originate.
- Jill Cainey (Erne Energy): How do battery and EV projections interact? Will stationary batteries remain once EVs penetrate the market?
  - CSIRO: These potentially complicated interactions have not yet been modelled. The modelling does ensure no double counting though. The maximum assumed rate of EV owners with home batteries is 60%.
- Anna Freeman (CEC): How can any scenario include internal combustion engine (ICE) vehicle sales persisting until 2065?
  - CSIRO: State targets and ambitions regarding EVs are not legislated policies. Only ACT's 2035 ban on new ICE sales, which cannot stop purchases elsewhere, is included as a

[2] See https://www.racefor2030.com.au/

legislated policy. There are sensitivities around the 2030 and 2050 outcomes, to include more or less climate ambition. Additionally, ICE retirements may be delayed to 2065 since some cars remain in circulation for 30-35 years.

- Caroline Valente (ECA): How does the decreasing proportion of younger drivers, and vehicle owners affect the overall EVs projection?
  - CSIRO: The biggest related issue is determining the new-normal kms driven and vehicle retirement profile post COVID. The report will discuss similar issues, including ride sharing and increased passengers per vehicle.
- Craig Memery (ISP Consumer Panel): Will privately owned hydrogen vehicles be viable in cities?
  - CSIRO: Currently fuel cell vehicles are being sold in cities, where the refuelling stations are located. But generally, this won't be competitive in the light vehicle market. They will only be viable in if they are subsidised.
- Cameron Potter (FFI): Should night profiles include middle of the day charging if the car is not being plugged in during the day? Is that from a particular tariff incentive?
  - CSIRO: Currently "off-peak" occurs at night, but the future may see "off peak" in the middle of the day to incentivise charging directly from rooftop PV.

5 Other business

- Ron Logan (Shell): Can any subsequent discussion outcomes be communicated to the FRG?
  - AEMO: These discussions will inform the draft 2023 IASR and relevant reports. Outcomes from discussions with the ISP Consumer Panel can be communicated with the FRG.

6 Meeting close

The next FRG meeting will be held on Wednesday 26 October 2022, presenting coal and gas price forecasts and outlining AEMO's 2021 Forecast Accuracy assessments.

Forecasting Reference Group (FRG) Actions Items

Table 1 FRG Action Items (at 25 October 2022)

Item	Date Raised	Topic	Responsible	Closing details	Status
1	21/9/2022	Respond to demand traces email	AEMO	AEMO responded to Joe Hemmingway's email with further clarification about demand traces.	**CLOSED**