DRAFT MINUTES – Forecasting Reference Group (FRG)

MEETING: #5

DATE: WEDNESDAY 29TH April 2020

CONTACT: Energy.Forecasting@aemo.com.au

Attendee	Company	Site
Harriet Tienstra	Acil Allen Consulting	Teleconference
Marike de Waard	Acil Allen Consulting	Teleconference
Ben Skinner	AEC	Teleconference
Carol Tran	AEC	Teleconference
Adrian Grantham	AEMO	Teleconference
Ali Habibi Khalaj	AEMO	Teleconference
Andrew Turley	AEMO	Teleconference
Bella Pennington	AEMO	Teleconference
Ben Jones	AEMO	Teleconference
Craig Price	AEMO	Teleconference
Daniel Collins	AEMO	Teleconference
Dean Soste	AEMO	Teleconference
Debborah Marsh	AEMO	Teleconference
Greg Staib	AEMO	Teleconference
Helen Wang	AEMO	Teleconference
Joachim Tan	AEMO	Teleconference
Kent Hanh	AEMO	Teleconference
Leslie Lay	AEMO	Teleconference
Levi Rosenbaum	AEMO	Teleconference
Lin Oh	AEMO	Teleconference
Linton Corbet	AEMO	Teleconference
Luke Dowling	AEMO	Teleconference
Magnus Hindsberger	AEMO	Teleconference
Matt Marston	AEMO	Teleconference
Natasha Sinclair	AEMO	Teleconference
Nicola Falcon	AEMO	Teleconference
Roberta Maher	AEMO	Teleconference
Stephen James	AEMO	Teleconference
Adam Day	AER	Teleconference
Craig Oakeshott	AER	Teleconference
Jennie Lu	Aeronergy	Teleconference
Peter Young	AGL	Teleconference
Michelle Nguyen	Alinta Energy	Teleconference
Mousami Prasad	ANU	Teleconference
Karan Sharma	APPEA	Teleconference
Ed White	Ausgrid	Teleconference
Marc Thiebaut	Ausgrid	Teleconference
Jacqui Bridge	AusNet Services	Teleconference
Nick Cimdins	AusNet Services	Teleconference

Sarah Hunter	BIS Oxford Economics	Teleconference
Thakshila Gunaratna	Clean Energy Council	Teleconference
Sam Ingram	CleanCo QLD	Teleconference
Andrew Cronin	CS Energy	Teleconference
Henry Gorniak	CS Energy	Teleconference
Mitchel Bishop	CS Energy	Teleconference
Paul Graham	CSIRO	Teleconference
Shira Samocha	Deloitte	Teleconference
Hannah Farrow	Energy Networks Australia	Teleconference
Norman Jip	DELWP	Teleconference
Katie Filippello	DISER	Teleconference
Brad Harrison	ElectraNet	Teleconference
Florie Fong	Energy Australia	Teleconference
Georgina Snelling	Energy Australia	Teleconference
Khai Chang	Energy Australia	Teleconference
Kyle Lin	Energy Australia	Teleconference
Patrick Gan	Energy Australia	Teleconference
Saliha Baykal	Energy Australia	Teleconference
Craig Pollard	Energy Queensland	Teleconference
Shane Brunker	Energy Queensland	Teleconference
David Hoch	Engie	Teleconference
Justin Gardner	Ergon	Teleconference
Ron Logan	ERM Power	Teleconference
Kate Osaze	ESCO Pacific	Teleconference
Abe Abdallah	ESCSA	Teleconference
Brent Hudson	Essential Energy	Teleconference
Mark Grenning	EUAA	Teleconference
Tristan Edis	GEM	Teleconference
Cameron Potter	Hydro Tasmania	Teleconference
Prateek Beri	Hydro Tasmania	Teleconference
Jakes Jacobs	IESYS	Teleconference
Ju-Ai Ng	Jemena	Teleconference
David Headberry	Major Energy Users	Teleconference
Bill Nixey	NSW DPIE	Teleconference
Reinzy Colle	NSW DPIE	Teleconference
Robert Simpson	Orica	Teleconference
Sarah-Jane Derby	Origin	Teleconference
Anna Livsey	PIAC	Teleconference
Adam Ryan	Powercor	Teleconference
Dor Son Tan	Powercor	Teleconference
Daniel Andersen	Powerlink	Teleconference
Enrique Montiel	Powerlink	Teleconference
Jonathon Dennis	Powerlink	Teleconference
Jennifer Brownie	QEUN	Teleconference
Phil Pollard	QUEEUN	Teleconference
Ben Denehy	QLD Government	Teleconference
Jose Viada	QLD Government	Teleconference
Bret Harper	RepuTex Energy	Teleconference
Peter Degorski	RepuTex Energy	Teleconference
Andrew Manson	SA Government	Teleconference
Marino Bolzon	SA Government	Teleconference
Elisia Reed	SA Power Networks	Teleconference
Matthew Napolitano	SA Power Networks	Teleconference
Dr Vivek Bhandari	Siemens	Teleconference
John Sligar	Sligar & Associates	Teleconference
Sharon Young	South East Water	Teleconference
Joe Hemingway	Stanwell	Teleconference
Herath Samarakoon	TasNetworks	Teleconference

Michael Brown	Tilt Renewables	Teleconference
Elsie Zhao	United Energy	Teleconference
Sanju Vargeese	United Energy	Teleconference
Sujeewa Vithana	United Energy	Teleconference
Navid Haghdadi	UNSW	Teleconference
Alberto Troccoli	WEMC	Teleconference
Peter Condon	Western Power	Teleconference

1. Welcome and Introductions

Daniel Collins (AEMO) welcomed everyone to the April FRG meeting.

The minutes from the March FRG meeting were accepted as final.

Nicola Falcon (AEMO) announced that a mid-cycle FRG meeting will take place on May 13th to discuss the impact of COVID-19 on energy consumption.

2. Presentation 1: COVID-19 scenarios summary

Sarah Hunter (BIS Oxford Economics) presented an update to its 'baseline' Central scenario and presented a 'downside' scenario.

Key topics raised by stakeholders during this section included:

- Ben Skinner (AEC) asked how long the downside scenario will remain viable. Sarah Hunter (BIS Oxford Economics) replied that the trigger for this downside scenario is a second wave of COVID-19 infections. The response to this will only be known once borders are reopened and social interaction restarts. This scenario can only be ruled out when there is a vaccine. The downside case reflects this long-term uncertainty which blunts productivity and causes a long tail on recovery trajectories.
- David Headberry (Major Energy Users) asked whether growth is forecast to return to pre-COVID-19 trends. Sarah Hunter (BIS Oxford Economics) answered that there is high uncertainty and downside risk preventing growth trends recovery. However, the growth following the pandemic is reliant on future migration patterns and Australia's relative appeal for immigrants.
- Cameron Potter (Hydro Tasmania) asked how much volatility there is in the forecasts and whether these two bookend scenarios are the upper and lower bounds. Sarah Hunter (BIS Oxford Economics) replied that the bounds remain far apart, but volatility has been reducing in recent weeks due to greater data access, more certain employment data and affirmation that short-term forecasts and assumptions have been accurate.
- Sarah Hunter (BIS Oxford Economics) was asked anonymously regarding BIS Oxford Economics' view on manufacturing returning to Australia. Sarah responded that international trade benefits Australia; increasing our quality of life and disposable incomes. There may be a pause on expanding international trade, but a winding back is highly unlikely.

Additionally, Sarah Hunter (BIS Oxford Economics) has kindly provided the following answers to questions asked on Slido.

Question	**Questioner**
The "rest of the world" might be quite different to the USA. Given that the foreign exchange is indexed against the USD, do you think US will be average?	Cameron Potter
The appreciation of the USD in general does mean that against the basket of currencies the depreciation of the AUD this year has been less pronounced when compared to the USD. Looking ahead, as with the USD profile we expect the currency to broadly hold steady this year and early 2021, before a gradual appreciation over the early/mid 2020s.	
How do BIS Oxford measure small business confidence and large business confidence? Confidence drives economic activity.	Jennifer Brownie
We use published series such as the NAB business survey and SME survey and the AiG-Commonwealth Bank Purchasing Managers Indices (these are disaggregated into Manufacturing, Services and Construction).	
How do BIS Oxford estimate impact on small business demand (businesses consuming under 100 MWh and under 20 employees) especially after Jobkeeper ends?	Jennifer Brownie
As we run our models at the macro level, we do not disaggregate business activity by size of firm	
Why do the smaller states and territories, particularly ACT, have better long-term outcomes in the downside case (i.e. growth rate in 2025)	Cameron Potter
ACT's fundamentals are generally more positive than other parts of the country (as has been the case in the past). The territory has a relatively robust outlook for population, and in the near term its focus on the public sector will provide an offset to the downturn in the private sector.	
Could a post Covid scenario in a depressed local economy see an influx of foreign investment interest as it becomes economic to invest here relative to overseas?	Anonymous
The weaker AUD makes investing in Australian assets attractive, all other things equal, particularly given the economic fundamentals are relatively favourable (when looked on a long-term perspective).	
Given recent news does BIS OX think there will be a quicker recovery rate in WA?	Anonymous
The faster unwinding of lockdown conditions will allow faster normalization, although as it currently stands it's likely that the rest of the country will also see a reduction in restrictions in the near term. WA will also see a negative impact from a fall back in capital expenditure in the oil and gas sector, particularly relative to our pre-COVID-19 baseline where this activity was expected to pick up.	
What would the policy effect have on the construction sector if there is stimulation later?	Stephen James
The construction sector is likely to be a major beneficiary, as we expect the government to undertake infrastructure projects across a range of sectors and	

states (although as this stage it's not possible to say which areas will be specifically targeted).	
It's not just population growth but growth in export earning regions like Central Queensland reliant on mining and mining processing jobs.	Jennifer Brownie
The impact of mining revenue is factored into the forecast and is part of the reason why Queensland is less impacted than NSW and VIC in the near term in terms of GSP.	
What do believe the inflation rate will be over the next 6 months and next year?	Jennifer Brownie
We are expecting to see deflation in the near term, as the impact of fuel price declines and the policy change to childcare costs (these services are now free for the user, which is the cost measured in the CPI). Inflation will also be dragged down by a six month freeze in health insurance premiums (which typically rise on 1st April) and the general economic weakness, which will drag on wages and prices. Higher food prices, partly a result of the ongoing impact of the bushfires and drought and partly related to stronger demand from consumers, will provide some offset.	
Mackay population growth prior to GFC about 2.5% down to negative 0.5% in 2015-16 and in 2018-19 is 0.3%. Can't assume COVID will not have same impact.	Jennifer Brownie
There is considerable uncertainty around the outlook for population growth, particularly in the near term (FY21 and FY22). The government has announced that they expect to see a sharp contraction.	
If we have a downside outcome - should public service spending go up more? i.e. massive health spending.	Anonymous
In the downside case we are assuming that controlling the pandemic requires the maintenance of at least the current restrictions. In this scenario we have assumed more government spending, but it's not *necessarily the case that it would appear in healthcare, as controlling the pandemic would (hopefully) limit demand on the healthcare system.*	
Could you give us an idea of the spread in the forecasts which presumably is quite large given the current volatility in markets/currencies?	Anonymous
It is true that heightened uncertainty at the moment means that the error band around the forecast are relatively wide right now. The two alternative scenarios developed for AEMO were designed to try and capture the book end cases. So there is limited upside beyond the baseline case, and the downside is intended to be used as a worst case scenario for the near term, given current conditions and the evolution of the pandemic.	

3. Presentation 2: Demand Side Participation (DSP) Methodology

Daniel Collins (AEMO) summarised submissions received during consultation for DSP methodology. Linton Corbet (AEMO) addressed the perceived drawbacks on methodology, explaining why the 50th percentile was chosen and that RERT participants are not included in DSP to avoid double counting. As an area of future development, AEMO wish to explore load increases as well as load curtailment in the 2020 ESOO, as increasingly relevant for managing power system security during minimum load conditions.
AEMO's Demand Side Participation Information (DSPI) guidelines will be reviewed in the 2nd half of 2020 with changes, among other things, to include information on possible load increases.

Key topics raised by stakeholders during this section included:

- Ben Skinner (AEC) asked whether RERT participants being allowed to provide DSP was double dipping. Magnus Hindsberger (AEMO) answered that double dipping is avoided by not allowing participants on RERT contracts to have been responding to market signals previously and only accepting programs on the RERT panels if they can demonstrate that they typically do not respond to market signals.
- Cameron Potter (Hydro Tasmania) asked whether DSP is defined as a projection or observation. AEMO's response is that DSP is derived from observed activity. Assuming recent, observed, levels will occur in the future is the basis for the forecast. The base forecast is then adjusted to account for known and committed future changes to DSP activity or programs.

4. Presentation 3: Forecast Accuracy Report (FAR) Methodology

Ben Jones (AEMO) presented on the methodology used to develop the Forecast Accuracy Report (FAR) which as part of the AER's Forecasting Best Practice Consultation Procedures, AEMO is formally required to consult on. Ben highlighted how uncertainty is represented in terms of AEMO's input, supply and demand forecasts. Magnus Hindsberger (AEMO) presented on how AEMO's DSP forecast performance will be assessed.

FRG participants are reminded that formal consultation has begun and to send submissions to the energy forecasting inbox (energy.forecasting@aemo.com.au) by 3rd June 2020. A link to the consultation page is provided

(https://aemo.com.au/consultations/current-and-closed-consultations/forecast-accuracy-report-methodology) (Action 5.4.1)

5. Presentation 4: Final Distributed Energy Resource (DER) Information – CSIRO

Paul Graham (CSIRO) presented on CSIRO's Final DER projections for solar, batteries and electric vehicles, and focussed on changes made since the February FRG on the draft projections. The changes included COVID-19 pandemic impacts, updated historical data, PV non-scheduled generation forecast updates and the redesign of the step change electric vehicle scenario to achieve zero internal combustion vehicles by 2050, following FRG feedback from February.

Key topics raised by stakeholders during this section included:

- David Headberry (Major Energy Users) questioned whether CSIRO's approach that normality will be achieved in 2 years was reasonable given BIS Oxford's earlier projection that GDP would be subdued until 2025. Paul Graham (CSIRO) acknowledged that there was uncertainty, however, noted that a slowdown in GDP growth did not always decrease levels of solar uptake as seen recently in Western Australia. CSIRO is more concerned about general customer confidence when setting scenarios and believes confidence will come back faster than GDP growth.
- Cameron Potter (Hydro Tasmania) asked why the Step Change and High DER ISP projections appear to have swapped places with the High DER and Step Change 20 projections respectively in the battery projections. Paul Graham (CSIRO) stated that this was due to AEMO's choice of CSIRO and Energeia projections when assigning 2019 forecasts to ISP scenarios. More information can be found on AEMO's Scenarios, inputs, assumptions, methodologies and guidelines page[1].
- Ed White (Ausgrid) asked if the solar industry had been consulted on actual reduction in leads and sales conversions or if it was based on other econometric inputs. Paul Graham (CSIRO) responded that it was based on a mixture of knowledge gathered and some assumptions at this stage.

Additionally, Paul Graham (CSIRO) has kindly provided the following answers to questions asked on Slido.

[1] https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/scenarios-inputs-assumptions-methodologies-and-guidelines

Question	**Questioner**
Can the rooftop PV projections be broken down into C&I and residential? Recent deployment has focused in C&I as a hedge against high price. Growth should decline	Prateek Beri
CSIRO projections provided to AEMO include full differentiation of residential and commercial solar systems.	
BIS suggested that GDP will be subdued even in 2025 so the assumption that demand reverts to normal realistic?	Anonymous
GDP growth complete recovery is not required for the PV market to recover. We have seen states in the past experiencing economic difficulties with strong PV numbers	
What is the assumed failure of solar panel installations? Many are failing after 5 years and have no warranty as company can't be found thus, they are obsolete.	Jennifer Brownie
We do not have sufficient data on failure rates to include in the modelling. Any hard data on this topic is welcome.	
Has the STC price forecast also been updated as a result of the solar slowdown?	Patrick Gan
No	
Was take up of Victoria 9subsidized solar panels down 65% in February prior to pandemic being declared on 12 March?	Jennifer Brownie
At the time of forecasting we did not consider the February data as being reliable and so did not investigate any issue associated with that month.	
Graph is degraded consumption. What is assumed life of domestic and residential solar panels?	Jennifer Brownie
Degradation is the reduction in effective capacity over the life. Life is 20 years.	
The world is awash with cheap oil. It shows oil producers kept producing even with demand down ie they will fight to keep ICE vehicles on the road.	Jennifer Brownie
Electricity was around two thirds cheaper than petrol in running costs before the recent oil crash. It's still around half the running costs after the crash.	

6. Presentation 5: Final Distributed Energy Resource (DER) Information – GEM

Tristan Edis (GEM) presented GEM's final DER projections for solar and batteries. Topics included: COVID-19 adjustments, and the drivers behind solar and battery uptake for both residential and commercial.

Key topics raised by stakeholders during this section included:

- Anonymous questioned whether one of GEM's scenarios should investigate a return to 2014 levels when the energy and Small-scale Technology Certificate prices were low. Tristan Edis (GEM) responded that this scenario was GEM's base case but noted that installation levels would not return to 2014 values due to the decrease in capital and installation costs.
- Ron Logan (ERM Power) asked what assumptions were made by GEM regarding available roof area in relation to the assumption that replacement systems will be twice the size of the original systems. Tristan Edis (GEM) responded that based on the feedback he has received, there was sufficient roof area to accommodate larger systems. In addition, it was now commonplace to have installation facing multiple directions (even South) rather than North only installations as has been the preference historically.
- Jennifer Brownie (QUEN) noted that there is a difference between degraded and obsolete solar systems and asked if GEM knew what the write off percentage was. Tristan Edis (GEM) stated that they had observed a steady degradation in the output of solar systems and some 20-year-old units were still producing at 80% of their original rated capacity. Tristan noted that the write off percentage of panels were low and that one of the primary reasons for panel replacement was the inverter breaking rather than the panels breaking.
- Ron Logan (ERM Power) asked what the assumption was, in relation to battery cost reductions, that caused batteries to be tied to solar installations. Tristan Edis (GEM) explained that GEM's model calculated payback and it determined that the payback on solar plus battery was better than solar alone which filtered into the assumption that consumers will adopt a battery system in conjunction with their solar units.

7. Other Business

Nicola Falcon (AEMO) acknowledged feedback received on the structure of this FRG meeting and welcomed any additional feedback going forward. Nicola noted that AEMO will go through all Slido questions submitted, to the extent that some of them may form part of the formal consultation process and be used as an indicator to where AEMO will need to put more explanation into its methodology documents.

Key topics raised by stakeholders during this section included:

- Anonymous asked whether AEMO could share more information on the updated GenCost figures and assumptions being used in the ISP. Nicola Falcon (AEMO) responded that this information will be published in the coming week.
- Jennifer Brownie (QUEN) noted that an agenda item on hydrogen had not occurred so far at any FRG in 2020 as agreed upon in late 2019. Nicola Falcon

(AEMO) noted that some hydrogen information was presented in the appendix of the draft ISP and that there will be a more comprehensive discussion in the final ISP but acknowledge that some hydrogen projects were still in its development stage. Once more work had been done, the information will be presented to the FRG through presentations and at workshops.

8. Meeting Close

The next FRG meeting is scheduled for May 27th 2020.

An out of cycle FRG meeting relating to COVID-19 impact is scheduled for May 13th 2020.

Forecasting Reference Group (FRG) Actions Items – OPEN (as at 14/05/2020)

Item	Date Raised	Topic	Action required	Responsible	By	Status
8.1.2	25/09/2019	Information sharing	Consider developing a mechanism for sharing inbox submissions with the wider FRG group. FRG to provide suggestions to AEMO.	AEMO and FRG	TBC	**OPEN** In interim, have included out of session submissions in meeting pack
5.4.1	29/4/2020	First stage of consultation on AEMO's FAR methodology	Participants to submit feedback to energy.forecasting@aemo.com.au	FRG Participants	3rd June 2020	**OPEN**

Forecasting Reference Group (FRG) Actions Items - CLOSED

Item	Date Raised	Topic	Action required	Responsible	By	Status
2.2.1	29/1/2020	Additions to final report	More detail on the short run and long-run drivers and the transition will be added into the appendix of the report.	Sarah Hunter (BIS Oxford Economics)	Release of final report	**CLOSED**