

# DRAFT SUMMARY – Forecasting Reference Group (FRG)

MEETING: #3.5

DATE: Friday 5 April 2019

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## ATTENDEES:

Attendee	Company	Site
Craig Oakeshott	AER	Adelaide
David Chapman	AER	Adelaide
Andrew Turley	AEMO	Brisbane
Magnus Hindsberger	AEMO	Brisbane
Siobhan Attwood	AEMO	Brisbane
Alessio Bonato	AGL	Melbourne
Ali Habibi Khalaj	AEMO	Melbourne
Azadeh Keshavarzmohammadian	AEMO	Melbourne
Bella Pennington	AEMO	Melbourne
Daniel Guppy	AEMO	Melbourne
Dean Soste	AEMO	Melbourne
Greg Staib	AEMO	Melbourne
Linton Corbat	AEMO	Melbourne
Thomas Scott-Morey	Collgar	Perth
John Sligar	Sligar & Associates	Sydney
Mick Fell	Energieia	Sydney
Alex Fattal	Origin	Teleconference
Ben Croker	Energy Queensland	Teleconference
Bill Nixey	NSW Government, Dept. of Planning and Environment	Teleconference
Brad Harrison	Electranet	Teleconference
Craig Pollard	Energy Queensland	Teleconference
David Headberry	Major Energy Users	Teleconference
Eli Pack	AEMO	Teleconference
Florie Fong	Energy Australia	Teleconference
Herath Samarakoon	Tas Networks	Teleconference
Jacqui Bridge	AusNet Services	Teleconference
James Ley	Energy Australia	Teleconference
Joe Hemingway	Stanwell	Teleconference
Lars Narushevich	AEMO	Teleconference
Liam Ryan	NSW Government, Dept. of Planning and Environment	Teleconference
Nick Cimdins	AusNet Services	Teleconference
Paul Graham	CSIRO	Teleconference
Pippa Williams	Hydro Tasmania	Teleconference

Prem Panickar	VIC Government, Dept. of Environment, Land, Water and Planning	Teleconference
Shira Samocha	Deloitte	Teleconference

## 1. Welcome and Introductions

Andrew Turley (AEMO) welcomed attendees to the March 2019 follow-up Forecasting Reference Group (FRG) meeting.

## 2. Electric Vehicles

Greg Staib (AEMO) discussed a comparison of the most recent draft forecasts for electric vehicles (EVs) from CSIRO and Energeia. Stakeholder questions covered a range of topics, with particular focus on uptake and ownership models.

Key topics raised by stakeholders during this section included:

- Uptake of EV
  - o (Energeia) Forecasts are driven by policy and regulatory settings. EV's lead to fuel savings in the long-term, however consumers are unlikely to balance out long-term fuel costs against the upfront cost when comparing to traditional internal combustion engine (ICE) vehicles. Policy can bring the capital investment decision forward to encourage EV uptake.
  - o (Energeia) Other key drivers include model availability, which is not strongly impacted by Australian policy.
  - o (CSIRO) Consumer confidence, and therefore uptake, can be increased by increasing the number of supportive policies.
  - o (CSIRO) Differences in EV uptake in fast and neutral scenarios is driven by cost and availability of fuel cells.
  - o (CSIRO) In the long-term, the relevance of policy declines and uptake is driven by non-policy factors, such as availability and location of charging facilities, and off-street parking.
  - o (CSIRO) One of the factors which contributes to the diversions in EV uptake in the last 20 years of the forecasts (2030-2050) is which customers' infrastructure needs will be met by EVs.
- Modelling data sources and methodology
  - o (Energeia) Used public announcements from car companies regarding model availability and changes to hybrid/EV.
  - o (CSIRO) The source of the charge profile [in 2018] was an after-diversity profile based on UK data, as there was not enough data domestically. CSIRO is confident that the shape captures diversity, however acknowledges that the scale was larger than ABS data would suggest, due to following the UK methodology. Acknowledged that when using this profile going forward it would be more accurate to use an average.
  - o (Energeia) Assumed that the night charging profile is the 'managed' charging profile, where the EV load will be controllable.

- Ownership models
  - o (Energeia) Assumed private ownership remains the main driver for vehicle purchases.
  - o (CSIRO) Beyond 2030, the forecast includes a modest assumption about the inclusion of some ride-share vehicles and a decrease in vehicle ownership per household. This assumption increases in the high DER scenario. Energy consumption from the grid is expected to be comparable to a scenario with no ride-sharing, as kilometres per vehicle increases. Some automation in household, public transport, and freight sectors is assumed, mostly affecting the number of vehicles on the road and a reduction in sales numbers.
  - o (CSIRO) There is a price elasticity effect – the cheaper cost of travel which arises from ride-sharing may induce more travel, so expected reduction in kilometres may not be observed.

### 3. Batteries

Mick Fell (Energeia) and Paul Graham (CSIRO) presented on their current draft battery forecasts, as presented at the 27 March FRG. Stakeholder questions covered a range of topics, with particular focus on residential tariffs and consumer behaviours.

Key topics raised by stakeholders during this section included:

- Cost assumptions
  - o (CSIRO) The cost of batteries is falling rapidly, due in part to the development costs of EVs. However, the inverter share of the cost is not falling at the same rate, so the overall cost reductions assumed are not substantial. Only expecting to see significant declines in production costs beyond the first 5-10 years of the forecasts (during which time prices are expected to remain relatively flat).
  - o (Energeia) When calculating return on investment for consumers (which contributes to uptake) battery cost declines and changes in tariff structures were considered.
  - o (Energeia) The model considers the individual financial cost to consumers rather than the best economic system cost. Acknowledged that in the long term, networks will need to consider measures to manage overall system costs.
- Battery number and installation assumptions
  - o (CSIRO) Used Sunwiz data for estimated number of installations. Approximately 20,000 installs last year, predicted to increase to approximately 22,500 installs in 2019.
  - o (Energeia) Retrofits of batteries on existing distributed energy resources (DER) households are included in battery number projections.
- Tariffs

- (CSIRO) The forecasts account for tariffs that reward consumers for using batteries to avoid use at times of peak grid demand, however there is limited confidence in what future time-of-use tariffs may be.
- (Energeia) Continued battery price declines lead to a significant number of retrofits occurring, as the return on investment for a retrofit increases.
- (Energeia) The model includes current tariffs and the cost reflective tariffs proposed to be implemented by network businesses over the course of the next regulation period. Assumed that the switch over from 'simple' to 'smart' tariffs in the next regulatory period are opt-out (in the Fast Change scenario), therefore consumers would automatically be migrated on to the new tariff when a new meter is installed, or an old meter is replaced.
- Consumer behaviour
  - (CSIRO) Assumed some consumers on time-of-use tariffs may charge in the period right before peak grid demand to avoid higher tariffs associated with peak demand. Noted that this only applies to a few customers on rare days when solar does not provide enough power to charge their personal battery.
  - (Energeia) The model maximises the consumers personal financial decision to use the battery against the assumed tariff structures.
  - (CSIRO) Little variability in sunlight hours for PV reduces the variability regarding charge and discharge profiles. Charging is likely to occur during the solar peak and discharging is likely to occur during evening peak demand, and depending on the size of the battery, could potentially continue overnight.

#### **4. PV**

Mick Fell (Energeia) and Paul Graham (CSIRO) presented on their current draft PV forecasts, as presented at the 27 March FRG. Stakeholder questions covered a range of topics, with particular focus on consumer dynamics.

Key topics raised by stakeholders during this section included:

- Residential uptake of PV
  - (Energeia) Consumer groups are split by building type (apartment, stand-alone) with only stand-alone buildings considered for PV installations.
  - (CSIRO) Consumer groups similarly split as with Energeia, but PV installations are also considered for renters and apartment buildings.
- Commercial uptake of PV
  - (CSIRO) Small (up to 100 kW) units and medium (100 kW to 1 mW) have similar strong uptake, whereas large (>30 mW) units are reliant on LGC subsidies and the recent price crash reduced growth in this segment.

- (Energeia) The three cases studied are broadly consistent with CSIRO, additionally with commercial reflecting 15% of small-scale capacity (up to 100 kW) in the short-term, 30% in the medium-term and 25% long-term.
- Consumer behaviour
  - (CSIRO) The “S”-like adoption curve is the main pattern applied to economic decision-making, within the current market and the mainstream adoption sector.
  - (Energeia) Consumer behaviour is modelled via a coefficient for uptake, which is correlated historically to the Return-on-Investment (ROI) for PV installations. This is then used to normalise model outputs to the expected consumer response for a given level of ROI.

## **5. Demand Traces**

Demand traces were discussed with respect to the import/export patterns of PVs, batteries and EVs and the cumulative effect these technologies have on grid-supplied demand.

The group generally agreed that the new demand traces should be inspected for perverse grid outcomes (example given: peak demand occurring at 2am). While detailed description and determination of these events was not discussed, it was generally agreed that the trace-building process should accommodate an allowance for iterative development of the traces. This would allow for screening for issues and potential adjustment of the subcomponents underpinning the traces.

## **6. Meeting Close**

The next FRG meeting is scheduled for Wednesday 24 April 2019