AGENDA – Forecasting and Planning Reference Group (FPRG)

MEETING: #3

DATE: Tuesday 30 January 2018

TIME: 2.30 pm – 4.30 pm AEDT

LOCATION: AEMO Melbourne Boardroom, AEMO Sydney Boardroom;
AEMO Fraser Room; AEMO Coonawarra Room, AEMO Ningaloo Room

TELECONFERENCE: Dial: 1800 055 132 Meeting ID: 35825361

CONTACT: Energy.forecasting@aemo.com.au

ITEM	TIME	TOPIC	PAPERS	RESPONSIBLE	ACTION
1.	2:30pm – 2:35pm	Welcome and Introductions	None	Tania McIntyre (Chair)	Note
2.	2:35pm – 2:40pm	Previous Minutes and Action Items	**FRG:** 20 November 2017 **PRG:** 14 November 2017	Chair	Note
3.	2:40pm – 3:00pm	Gas Statement of Opportunities (GSOO) Timing/Forward Plan of Publications (Forecasting)	Paper 1	Rachael Shaw (AEMO)	Note/ Discuss
4.	3:00pm – 3:15pm	Generator Information (Forecasting)	Presentation 1	Matthew Marston (AEMO)	Note/ Discuss
5.	3.15pm – 3:35pm	Integrated System Plan Update (Planning)	Verbal Update	Craig Price (AEMO)	Discuss
6.	3:35pm – 3:55pm	Trends and Generator Reliability (Forecasting)	Presentation 2	Nick Culpitt Luke Sumner (AEMO)	Discuss
7.	3:55pm – 4:15pm	Other Business • Medium Term Projected Assessment of System Adequacy Update (Forecasting and Planning)	None	Nicola Falcon (AEMO)	Discuss

8.	4:15pm – 4:30pm	Meeting Close	Next meeting scheduled: **FRG**: Tuesday 27 February 2018 **PRG**: Tuesday 13 February 2018	Chair	Note / Agree

DRAFT MINUTES – Forecasting Reference Group (FRG) Gas and Electricity

MEETING: # 2

DATE: Monday 20 November 2017

CONTACT: Energy.Forecasting@aemo.com.au

ATTENDEES:

NAME	ORGANISATION	LOCATION
Daniel Guppy	AEMO	Melbourne
Greg Staib	AEMO	Melbourne
Jo Dean (Secretariat)	AEMO	Melbourne
Leanna Tedesco	AEMO	Melbourne
Linton Corbet	AEMO	Melbourne
Ruchira Ray	AEMO	Melbourne
Scott Maves	AEMO	Melbourne
Tania McIntyre (Chair)	AEMO	Melbourne
Abe Abdallah	SA Government	Adelaide
Marino Boulder	Dept. of Premier and Cabinet	Adelaide
Panos Priftakis	Snowy Hydro	Melbourne
Sujeewa Vithana	United Energy and Multinet Gas	Melbourne
John Sligar	Sligar and Associates	Sydney
Nick Cimdins	AusNet Services	Teleconference
Shane Tennent	Dept. of Energy and Water	Teleconference
David Whitelaw	Dept. of Environment and Energy	Teleconference
Bryan Scott	Hydro Tasmania	Teleconference

1. Welcome and Introductions

Tania McIntyre (AEMO) welcomed the FRG to the second meeting for this reference group.

2. Previous minutes and action items

Tania McIntyre (AEMO) ran through the Action Items from the September 2017 meeting. The meeting minutes were accepted and noted as final.

Updates on outstanding Action Items have been appended below.

3. Gas Transformation Update

Greg Staib (AEMO) provided an update on the Gas Transformation report stating that a lot of different types of data are collated for the annual report, citing types such as population, weather, distribution transmission data for gas as well as customer specific data from surveys conducted. The key risk with this is that some of the data

could be out of date by the time of release. A lot of this data collection burden also falls to industry as is a very long process.

To streamline these processes, AEMO are embarking on a transformation project (with IT systems) to automate this approach. The secure storage of data and improved data definitions will result from this project.

Scott Maves (AEMO) added that until last year (in all states except for Victoria) all metadata was obtained by a metadata request from industry. This was a very drawn out and time consuming process, citing approximately 100 days of effort internally.

Scott noted that if metadata is obtained annually, accuracy cannot be guaranteed. This was flagged as a high priority area for AEMO's improvements program.

To overcome this challenge AEMO have been working with industry and Retailers to build an automated data process. A data sharing arrangement has been set up with CGI Logica, who run the FRG systems for New South Wales. Through this arrangement we will have the ability to have an ongoing metadata feed to track gas consumption data for these two states.

AEMO have also been working with internal Retail and Gas teams to leverage off the Gas Bulletin Board and Full Retail Competition (FRC) systems to build a data stream around this. This will minimise the need for data requests and the need to monitor gas consumption in real time.

Previously, this data was collected annually from all jurisdictions and various participants for the update process. However, with the fast changing industry, moving forward forecasts will need to be updated in a timelier manner with the hope to build an automated data stream near real time, dependant on frequency of data.

Scott Maves advised that AEMO are in the in process of updating gas forecasts with the next forecast scheduled for release in March 2018.

4. Early feedback from LNG Consortia on updated LNG outlook

Ruchira Ray (AEMO) presented on the early feedback from LNG Consortia with an update on the LNG outlook.

Ruchira informed the FRG that Lewis Grey Advisory had been contracted in July 2017. This year they were drafted to forecast on LNG gas and electricity consumption for the next 20 years. Since this time, the LNG consortia have been approached for feedback on these projections.

The feedback received from the LNG Consortia was that they were happy with the weak and neutral projections and these were consistent with their expectations for the long term trend. A difference in assessment from these projections were around the strong scenario.

The scenarios are defined by economic outlook on an annualised basis of the percentile. The LNG consortia believe that the percentile should be higher, in terms of timing with a five year lead time from exploration to production. This area is being reviewed.

The next steps as outlined by Ruchira are to take this feedback back to Lewis Grey Consulting. Dependant on their advice, the aim is to finalise this by the end of December 2017.

5. Connections Point Forecasting Improvement Program

Linton Corbet (AEMO) ran through Presentation 2 on the Connection Point Forecasting Improvement Program. Linton outlined the large list of considerations for the upcoming electricity forecasting and maximum demand forecasting.

New forecasting features to be investigated further as include:

- Forecasting minimum demand at connection points
- How information is published and improvements for external customers with a new portal to increase interactivity.
- New technology: Operation of batteries, where these may be installed and estimate what this means for max demands.
- Rooftop PV: Considerations on the allocation aspects of future PV to connection points.
- Improvements to current forecasting methodology and approach.
- Changing climates: Review the use of historic data use. (Currently reviewing 20 years of data).
- Economic variables: Review whether more information of economic activity should be included.
- Relationship between weather and maximum demand: Look at shortening to five years from 10 years as the short time series could be more relevant.
- Block loads: Step changes in demand data. For example a new industrial facility open or close and the effect this would have.

A query was raised regarding weather variations, specifically how the impact of sea breezes affect load? Linton Corbet (AEMO) advised that this has been looked at in the past and would add this to the list for consideration.

David Whitelaw (Dept. of Environment and Energy) commented that companies are actively looking at ways to either reduce their load or shift load to cheaper times due to prices. David queried to what extent are AEMO looking at forecast modifications to assist with this?

Greg Staib (AEMO) responded that when looking at a forecasting system, a review of how the demand responses will play out on short term pricing signals as well as long term decisions needs to be undertaken. There is work currently underway in terms of demand response and how this is organised on the forecasting response.

It was agreed that this would be investigated further.

Nick Cimdins (AusNet) queried whether spatial allocation of rooftop PV would be completed in concert with regional forecasts. Linton Corbet (AEMO) advised that this would be done in concert in the final step.

Nick queried the effective battery storage, requesting what sorts of data would be used to get a baseline for the batteries being used. Leanna Tedesco (AEMO) advised that there will be a battery storage register established in 2018.

6. Demand Side Participation (DSP) Update

Chris Mock (AEMO) presented on the Demand Side Participation (DSP). Chris advised that that the system guidelines for DSP are currently being developed, allowing AEMO to capture DSP information.

Currently AEMO are looking at the roll out of an online portal for participants to provide this information securely.

The key messages from this presentation are:

- AEMO is currently asking participants to provide contact details. There is a form to capture the contact point which has been set up on the MarketNet system.
- The pre-production testing phase will begin in December this year. Anyone who is interested in participating in this test should register via the link.
- Initial production data collection will commence in April 2018.

The link for this can be found in the slide deck issued with the meeting papers and on the AEMO website.

7. Medium Term Projected Assessment of System Adequacy (MT PASA)

Brooke Edwards (AEMO) provided an update on the Medium Term Projected Assessment of System Adequacy (MT PASA).

Brooke advised that the MT PASA implementation date has changed to 15 February 2018. The Reliability Standard Implementation Guidelines effective date has changed to this date also.

An MT PASA workshop will be held on 18 January 2018, following on from the one held in June 2017 to give stakeholders an overview of the new system and outputs. The participant trial will commence on the 18 January 2018 and will run through to February 2018.

Emails will be provided to give more information. Any questions or queries can be directed to energyforecasting@aemo.com.au or jo.dean@aemo.com.au

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8. Other Business

The 2018 Industry Schedule the first six months of 2018 has been released in draft form and is available on website.

9. Meeting Close

The next Forecasting meeting is scheduled on the 20 January 2018. This will be a combined PRG and FRG meeting.

Forecasting Reference Group (FRG) Actions Items

Item	Date Raised	Topic	Action required	Responsible	By	Status
1.4.1	19-Sep-17	Summer Analytics Program	Chat with Ausnet Services regarding the ARENA project with Solcast. GS Update – Spoke with Luke at Solcast – insights to be released in future. Commitment from Siro for 1 resource. *20/11 Update* – Yet to commence program.	Scott Maves (AEMO) Greg Staib (AEMO)	24-Oct-17	In progress
1.4.2	19-Sep-17	Summer Analytics Program	Discuss consumer behaviour around tariffs with Craig Memery (PIAC) 20/11Update - relates to analytics program – comment taken on board.	Scott Maves (AEMO)	24-Oct-17	In progress
1.5.1	19-Sep-17	Electric vehicles	Confirm penetration of EVs is for a strong, neutral and weak scenarios.	Greg Staib (AEMO)	24-Oct-17	Completed
6.5.1 (FPRG)	22-Aug-17	Price Response	Chat further with Jennifer offline regarding potential data sources.	Leanna Tedesco (AEMO)	September-17	Completed
6.5.2 (FPRG)	22-Aug-17	Price Response	Scott to present a draft project scope at the next Forecasting Reference Group	Scott Maves (AEMO)	September-17	Completed
6.7.1 (FPRG)	22-Aug-17	Forward Plan	Future Forecasting and Planning meeting dates to be communicated.	Brooke Edwards (AEMO)	September-17	Completed
5.3.2 (FPRG)	18-July-17	Electricity Forecasting Insights	Further discussion with Prasad re: date stamps for reports on the data portal.	Magnus Hindsberger (AEMO)	22-August-17	Completed

5.3.3 (FPRG)	18-July-17	Electricity Forecasting Insights	AEMO to discuss influencers and sensitivities associated with AEMO forecasts with Ausgrid (Craig Tupper).	Magnus Hindsberger (AEMO)	22-August-17	Completed

DRAFT MINUTES – Planning Reference Group (PRG) Gas and Electricity

MEETING: # 2

DATE: Tuesday 14 November 2017

CONTACT: PRG@aemo.com.au

ATTENDEES:

NAME	ORGANISATION	LOCATION
Tania McIntyre (Chair)	AEMO	Melbourne
Kirsty Camilleri (Secretariat)	AEMO	Melbourne
Craig Price	AEMO	Melbourne
Michael Eastwood	AEMO	Melbourne
Nadesan Pushparaj	AEMO	Melbourne
Elijah Pack	AEMO	Brisbane
Magnus Hindsberger	AEMO	Brisbane
Brooke Edwards	AEMO	Perth
Ray Pannam	Energy Queensland	Brisbane
Michael Pierce	AGL	Melbourne
Ben Skinner	Australian Energy Council	Melbourne
Richard Paprzycki	Energy Australia	Melbourne
Brian Williams	Snowy Hydro	Melbourne
Kevin Ly	Snowy Hydro	Melbourne
John Sligar	Sligar and Associates	Sydney
Elizabeth Bowron	AEMC	Teleconference
Jackie Biro	AEMC	Teleconference
Craig Oakeshott	AER	Teleconference
Tim Jordan	CEFC	Teleconference
Paul Dowling	CEFC	Teleconference
Brad Parker	Electranet	Teleconference
David Hoch	Engie	Teleconference
David Headberry	Major Energy Users	Teleconference
Bryan Scott	Hydro Tasmania	Teleconference
Marian Piekutowski	Hydro Tasmania	Teleconference
Amjad Adil	NSW Government	Teleconference
Chloe Hicks	NSW Government	Teleconference
Kathy Staggs	NSW Government	Teleconference
Prasad Tadipatri	NSW Government	Teleconference
Tom Clark	NSW Government	Teleconference
Enrique Montiel	Powerlink	Teleconference
Cameron McLean	Powerlink	Teleconference
Marino Bolzon	SA Government	Teleconference
Jennifer Brownie	QLD Electricity Users Network	Teleconference

1. Welcome and Introductions

Tania McIntyre (AEMO) welcomed stakeholders to the second Planning Reference Group (PRG) meeting.

2. Administration

Tania McIntyre (AEMO) ran through the action items from the September 2017 PRG meeting which are appended to these meeting minutes. The agenda was confirmed, and the September 2017 PRG meeting minutes were accepted as final.

3. Integrated Grid Plan Update

Craig Price (AEMO) referred to Presentation 1 as distributed in the meeting pack, noting that the purpose of the Integrated Grid Plan (IGP) is to provide a fully integrated strategic plan for the NEM, whilst examining Finkel recommendation 5.1 as one potential pathway to delivering the objectives. Craig advised that AEMO is proposing to defer the December 2017 National Transmission Network Development Plan (NTNDP) and instead integrate this work with the IGP. AEMO proposes to release a consultation paper in December 2017 to seek input and feedback for the development of the IGP.

David Headberry (Major Energy Users) asked whether AEMO is looking into making the NEM more strongly interconnected. Craig advised that the IGP would examine the range of potential pathways from a more integrated NEM to a more distributed NEM.

Marino Bolzon (SA Gov) queried whether AEMO will incorporate the work Electranet is doing on interconnection into this plan and Craig advised that AEMO is working very closely with Electranet with regards to this.

Richard Paprzycki (Energy Australia) queried whether the National Energy Guarantee (NEG) will be a part of this IGP and Craig advised that the NEG is a separate piece of work.

Craig informed the group of the work that has been completed with regards to the renewable energy zones (REZ). A workshop was held earlier in November to discuss these in further detail. Mapping was completed by DNV-GL and Craig discussed the information that was (and was not) considered in this REZ mapping.

Michael Pierce (AGL) asked whether loss factors are being considered and Craig confirmed this.

Richard also asked whether inertia will be provided in each region to ensure system strength. Nadesan Pushparaj (AEMO) advised that if system strength is identified as issue, either new entrants or TNSPs will need to provide inertia services (whoever is to blame).

Brian Williams (Snowy Hydro) questioned how this REZ mapping compares with mapping that is being done by other organisations. Craig advised that AEMO is aiming to have a cohesive picture of the entire eastern sea board. Brian also asked whether the REZ mapping is driven by connection enquiries that are already on the table and Craig noted that these are definitely taken into consideration.

Kevin Ly (Snowy Hydro) queried how this work on REZ fits into the overall NTNDP, Craig indicted that REZ will be integrated into the IGP.

Kevin then advised that Snowy Hydro has been working closely with Transgrid with regards to transmission modelling for Snowy Hydro 2.0 and that they would be keen to sit with AEMO to finalise this plan. Craig Price's details will be passed on for this discussion.

Jennifer Brownie (QEUN) highlighted concerns about the costs of future networks for consumers. Craig acknowledged this and clarified that the goal was to examine a range of pathways to determine the likely least cost way of continuing to provide reliability and support energy services for consumers.

Marian Piekutowski (Hydro Tasmania) questioned whether AEMO is taking into consideration diversity of resources within each REZ. Craig advised that diversity technologically, climatically and geographically within and across zones is a key consideration of identifying the optimal REZ to support the NEM.

4. Planning scenarios discussion

Magnus Hindsberger (AEMO) ran through slides nine to 12 with regards to the scenarios that have been developed. Magnus ran through key uncertainties for the energy industry, exploring the needs for transmission and the preliminary scenarios that have been developed for the June 2018 IGP.

Michael Pierce (AGL) queried whether all of the behind the meter assumptions are being included or whether different economics are being used for these cases and then being solved. Magnus advised that there are economic drivers behind them based on current modelling.

Kevin Ly (Snowy Hydro) asked whether the emissions trajectory for the strong scenario (90%) is based on the 2005 models and how this reconciles with the aspirational targets (e.g. the NSW zero emissions by 2050). Magnus advised that a number of targets for 2050 are being considered and the 90% was agreed on since it was a realistic percentage close to the aspirational 0% targets. The 2050 trajectory is relative to the 2016 models.

Paul Downing (CEFC) commented that he would have expected the energy efficiencies for neutral and strong would be switched around (slide 11) i.e. strong energy efficiency to line up with a low transmission need. It was also queried whether AEMO has considered strong economic growth (industrial) in their scenarios. Magnus advised that the strong scenario already assumes large industrial loads coming online, and these get updated based on survey data. The current choice for energy efficiency is linked to the current scenarios. AEMO will review again if these should be swapped around to drive stronger outcomes.

Marian Piekutowski (Hydro Tasmania) asked whether AEMO is looking at these scenarios on a holistic NEM point of view rather than state-based, especially with regards to energy efficiency targets. Magnus responded that both are being looked into.

Jennifer Brownie (QEUN) noted concern with the timeframe's AEMO uses for planning, considering how quickly things can change within one year. Jennifer also asked whether AEMO is looking into communicating potential areas of development post 2020. Magnus advised that post 2020 the situation uncertain than the near term. Post 2020 the closure of the Liddell power station will require a number of new generators to come online to make up for the generation loss and the location and type can vary significantly between scenarios.

5. Levelised cost of Electricity (LCOE) discussion

Michael Eastwood (AEMO) noted that inputs used in AEMO's modelling for reliability and the IGP include build costs, operating costs, fuel costs, costs of capital, and plant lifetime. These inputs can be summarised, for ease of comparison, into an indicator or reference price called the levelised cost of electricity (LCOE). Referring to the chart on slide 13, Michael pointed out that wind and solar are the cheapest options going forward compared to gas plants. Interestingly, wind and solar are pretty close in price up until the late 2020s. Michael pointed out that the example uses solar figures from NSW since it's considered a more neutral base. Since gas installations can vary so much, it can be very sensitive to gas price. AEMO sought feedback on whether or not these assumptions were reasonable.

David Hoch (ENGIE) stated that the chart comparing firm dispatchable technologies with intermittent technologies is misleading (i.e. not comparing apples with apples). The technologies being compared aren't homogeneous in provision of services and functions. Capacity and dispatchability are important parameters and need to be factored into the comparison. There are papers covering such an approach and include the IEA (levelised system costs of intermittent generation). It was also pointed out that external bodies, including policy makers, refer to AEMO data and it is essential that the correct comparisons are made. Suggested to add another chart using appropriate methodology is also included. AEMO undertook to follow-up this issue.

Ben Skinner (Australian Energy Council) commented that there should not much be much difference to outcomes whether we use the gas prices at $5 or $12, the merit order would still remain. Michael advised that is correct, however this provides a location signal.

Kevin Ly (Snowy Hydro) asked whether the solar and wind LCOE incorporates any balancing costs. Michael noted that this has not been included in this graph however AEMO has found that

if batteries costs are included, it will still sit below the cost of gas in most cases. The uncertainty in energy and resultant capacity factor complicates the matter.

Ray Pannan (Energy Queensland) queried whether the cost has been broken down based on remote locations vs urban locations and Michael advised that this has not yet been completed.

Paul Dowling (CEFC) requested further information on the $5/GJ gas price and whether assumptions around lifting of on-shore gas and transport costs were included, as he is concerned that this cost is very low. Michael informed the group that the gas prices are provided to AEMO by Core Energy Group, and that will look into whether these are correctly represented.

Kevin Ly asked what input source has been used for wind and solar data. AEMO advised that a uniform set of build costs for capital expenditure and a lifetime assumption has been used, as well as capacity factors from traces used in AEMO's model.

Stakeholders requested further data with regards to assumptions, to support the chart on slide 13.

Post meeting note: AEMO provides this information as part of the NTNDP database, which will be published with the June 2018 Integrated Grid Plan. Last year's database can be accessed here. All stakeholder feedback from this PRG meeting will considered for the 2018 modelling and assumptions.

David Headberry (Major Energy Users) pointed out that the solar 32% single access tracking implies solar concentrating, and queried whether it would be worth having solar thermal in there also. Michael advised that this is not solar concentrating, it is single access tracking solar PV. Solar thermal is not being modelled currently.

Stakeholders agreed that a more consistent and slightly higher Weighted Average Cost of Capital (WACC) should be used by AEMO.

Kevin Ly queried why pumped hydro has not been considered in this analysis and Michael advised that presenting them on the same chart proved tricky since pumped hydro is not a net producer of electricity, utilises storage capacity (with a loss) to provide capacity when needed. There has been a suggestion to prepare another slide with the 'levelised cost of firm capacity' for all potential new supply sources. Michael mentioned that expressing a levelised cost of firm capacity simply is difficult because it depends on what time period is defined as "firm".

6. Other Business:

Medium Term Projected Assessment of System Adequacy (MT PASA)

Brooke Edwards (AEMO) reported that the production release date for MT PASA has been delayed to 15 February 2018. This in turn delays the updated reliability standard implementation guidelines (RSIG) and in the interim the current guidelines remain in place.

Brooke also informed the group that a workshop is being planned for 18 January 2018, where trials will commence after this workshop. More information will be communicated via email shortly. If you would like to register your interest for this workshop please email prg@aemo.com.au. Invites will be sent out by the end of November 2017.

2018 Industry Meeting Schedule

Tania McIntyre (AEMO) advised that the draft Industry meeting schedule for January to July 2018 has been drafted and included in the meeting pack. This is also available on the AEMO website here.

7. Meeting Close

Tania thanked attendees for their participation in the November PRG. The next PRG meeting is scheduled for 30 January 2018 and will be a combined meeting with the Forecasting Reference Group (FRG). The December 2017 meeting has been cancelled.

8. Planning Reference Group (PRG) Action Items

No action items were recorded during this meeting.

FORECASTING AND PLANNING REFERENCE GROUP (FPRG)

Subject	Gas Statement of Opportunities (GSOO) Timing/Forward Plan of Publications
Agenda Item:	3
Contact:	Rachael Saw (AEMO), Senior Engineer.
Date:	Tuesday 30 January 2018

1. EXECUTIVE SUMMARY

Item raised by:	AEMO
Rule requirement:	National Gas Rules, Part 15D
Link to National Objectives:	The GSOO aims to provide information that will assist the industry in meeting the NGO and NEO.
Previous forum discussion(s):	Not previously discussed
Item impact:	AEMO proposes to delay the GSOO for a mid-June publication.
Impacted parties:	Existing industry participants and potential new entrants including producers, infrastructure asset owners and large customers. Governments, jurisdictional bodies, media, general public.
Purpose:	AEMO wishes to inform the FPRG of the potential for a delayed GSOO publication, and open to the group for discussion.
Desired outcome:	To understand any concerns parties may have with a delayed GSOO publication, and if there are any options to eliminate these concerns.

2. BACKGROUND

As stated in the National Gas Rules, Part 15D, AEMO is required to publish the Gas Statement of Opportunities (GSOO) by March 31 each year, or when significant and verifiable new information relevant to the GSOO is brought to AEMO's attention. The gas demand forecasts, published in previous years as the National Gas Forecasting Report, are also required to be published by the same date.

3. DISCUSSION

AEMO is proposing to delay publication of the GSOO, including gas demand forecasts, from 31 March to mid-June 2018, in order to better align with the Federal Minister for Resources' timeframes for determining a domestic shortfall year as part of the Australian Domestic Gas

Security Mechanism (ADGSM). This would reduce the administrative burden on participants who are required to provide AEMO with input data for both the GSOO and ADGSM, and improve consistency between the supply adequacy assessments.

The planned delay to the GSOO publication would also allow AEMO to defer until valuable information is available, so as to provide the best information possible to all stakeholders.

The previous 12 months has seen increasing scrutiny of, and engagement with, the gas industry, with publications from AEMO including:

- 2017 March GSOO
- June 2017 Energy Supply Outlook
- September 2017 Update to Gas Statement of Opportunities.

Similarly, the ACCC published two inquiries into gas supply and demand for wholesale gas in Australia, one in September 2017 and one in December 2017. Each of these updates and inquiries have included input directly from stakeholders, and have been developed using the best possible information.

Industry and stakeholders are therefore well informed of the current short term gas demand and supply outlook.

In preparing for a March 2018 publication for the GSOO, AEMO has again reached out to stakeholders for updated data on demand for gas, gas production forecasts, and infrastructure capability.

Many stakeholders advised that there was no new information available, however some stakeholders have informed us that key gas production and shipping investment decisions are due to be made at company board meetings early this year.

If AEMO were to progress with a March publication of the GSOO, we would be unable to provide significant new information beyond what has been released in the ACCC Gas inquiry December 2017 interim report, and any modelling and analysis would need to progress without any of the new information on new projects being determined in February and March.

4. RISKS / FINANCIALS

Stakeholders value the GSOO for an independent, third party assessment of gas market adequacy that can be used to guide policy development and assist stakeholders in making investment decisions. The information published as part of the GSOO, including gas demand forecasts, is also used by stakeholders to inform their own analysis.

AEMO is keen to understand whether the delayed timing in releasing this information will cause any issue for stakeholders.

Further, if new information is provided by gas producers and shippers in April 2018 to support the GSOO, it will be important for AEMO to follow a robust data integrity process to minimise differences between data used to inform the GSOO and data provided to the ACCC to support the ADGSM. As part of this data integrity process, AEMO will be seeking ACCC review of the information received so that any data differences are well understood, and impacts considered. There is a risk that a GSOO update may still be required as part of the ADGSM process if information provided by producers and shippers in April is significantly different to the information provided to ACCC.

Is there anything that can be done to mitigate these issues?

5. TIMING AND NEXT STEPS

Publication of the GSOO and demand forecasts in June, 2018.

COMMITMENT CRITERIA

FOR DISCUSSION

SUBJECT: REVIEWING CRITERIA AND CLASSIFICATIONS FOR NEW PROJECTS

DATE: 4

1. OBJECTIVE

To review and provide feedback on proposed classifications and application for new generation projects not yet in operation. Purpose of the review is to make sure that projects likely to be committed in near term to meet policy objectives (such as Victorian Renewable Energy Target) are captured in AEMO studies where appropriate, and to introduce consistent interpretation of commitment categories across AEMO.

2. DISCUSSION

2.1. STRATEGIC LINKS / USES

Influences assumptions used for reliability assessments, marginal loss factor analysis, and national transmission network development plans.

For marginal loss factor analysis and Victorian TUoS calculations, only projects known to be operational in the next year will be included due to the financial consequences of these assumptions. However, AEMO is keen to also test sensitivity to other projects becoming operational within the one year horizon, where this is considered likely.

For planning and market insights, freedom to select projects with varying degrees of certainty is preferred. Some consistency in treatment of projects at various stages of development is ideal, although it is acknowledged that some level of subjectivity is unavoidable.

2.2 LEGAL REQUIREMENTS AND CONFIDENTIALITY

AEMO has an obligation under NEL section 54 to protect confidential information, although the obligation to protect the information is not unlimited. AEMO may use confidential information to perform any of its functions, and may disclose this information where:

- Authorised by the Rules – see section 54A(2); or
- The information is in the public domain – see section 54G(1)(d)).

Clause 3.13.3(q) or the NER requires the statement of opportunity to include generating capabilities for which formal commitments have been made for construction or installation within the next 10 years.

The following recommendations are focused on providing greater visibility of project progress for internal purposes, and externally to show prevailing location of future generation projects on a regional basis.

3. RECOMMENDATIONS

3.1 Recommendation 1: Apply a traffic light system to existing categories and clarify the summary table below

Table 7 Commitment criteria

Category	Criteria
Site	The proponent has purchased/settled/acquired land (or legal proceedings have commenced) for the construction of the proposed development.
Major components	Contracts for the supply and construction of the major components of plant or equipment (such as generating units, turbines, boilers, transmission towers, conductors, and terminal station equipment) should be finalised and executed, including any provisions for cancellation payments.
Planning consents/ construction approvals/EIS	The proponent has obtained all required planning consents, construction approvals, and licences, including completion and acceptance of any necessary environmental impact statements (EIS).
Finance	The financing arrangements for the proposal, including any debt plans, must have been concluded and contracts executed.
Final construction date set	Construction must either have commenced or a firm commencement date must have been set.

Green = all criteria related to that particular category have been satisfied (see recommendation 3)
Amber = at least 50% of criteria related to that particular category have been satisfied
Red = less than 50% of criteria related to that particular category have been satisfied

Proposed new table 7: Generation project commitment criteria

Category	Criteria
Site	The project proponent has purchased/settled/acquired (or commenced legal proceedings to purchase/settle/acquire) land for the construction of the project.
Major components	Contracts for the supply and construction of major plant or equipment components (such as generating units, turbines, boilers, transmission towers, conductors, and terminal station equipment) have been finalised and executed, including any provisions for cancellation payments.
Planning consents, construction and connection approvals, EIS	The proponent has obtained all required planning consents, construction approvals, connection contracts (including Generator Performance Standard agreement from AEMO in the form of the 534A letter), and licences, including completion and acceptance of any necessary environmental impact statements.
Finance	The financing arrangements for the proposal, including any debt plans, must have been concluded and contracts executed.
Final construction and commercial use dates set	Construction of the proposal must either have commenced or a firm commencement date must have been set. Commercial use date for full operation must have been set.

3.2 Recommendation 2: include commercial use date in the data criteria

"Final construction and commercial use dates set: construction must either have commenced or a firm commencement date must have been set. Commercial use date for full operation must have been set." (see table above)

3.3 Recommendation 3: define criteria for each category based on the following questions

In relation to this unit:

Site Question 1	Is land for the construction of all required components secured (including securing easements for new transmission lines, if required)?
Components Question 1	Has the detailed design for this project been completed?
Components Question 2	Are contracts for the supply and construction of major plant or equipment finalised and executed, including any provisions for cancellation payments? + This includes generating units, turbines, boilers, transmission towers, conductors, and terminal station equipment.
Planning Question 1	Has an application for connection agreement with a network service provider been lodged?
Planning Question 2	Has a connection agreement with a network service provider been approved?
Planning Question 3	Has AEMO accepted the generation performance standards (GPS)? + This will be confirmed by AEMO.
Planning Question 4	Are all relevant environmental approvals for construction and operation obtained?
Planning Question 5	Have all relevant planning and licensing approvals from local and state government authorities been obtained?
Finance Question 1	Does the unit have an associated Power Purchase Agreement (PPA)? If not, are there other financing arrangements in place (such as Merchant financing)?
Finance Question 2	Has final investment decision (FiD) been reached, under the usual commercial definition of Board financial approval regarding when, where and how much capital is being spent?
Date Question 1	Has construction commenced or a firm construction date been set? + If so enter the date to the nearest month (even if in the past), if not, leave the date as "Not set".
Date Question 2	Has a commercial use date been set? + If so enter the date (to the nearest month), if not, leave the date as "Not set". OR Please specify expected commercial use date to the nearest month. + Required once a formal commitment to construct has been made

Note that +… refers to help text as opposed to main question text before it.
Answers to be treated as confidential until formal commitments have been made for construction
Note also that, if all other questions have been answered in the affirmative, or if construction has commenced (i.e. construction date is in the past) and the project would otherwise be considered advanced, the wording of the last question will change to "Please specify expected commercial use date to the nearest month".

3.4 Recommendation 4: classify projects according to traffic light categorisation and introduce new status classifications

NOTE:

1) A commitment criteria is deemed to be “satisfied” if all associated questions have been answered in the positive, making the category “green”.
2) A commitment criteria is deemed to have “progressed” if the category is “amber or “green”

New production and transmission projects fall into one of five classes of certainty:

- **Committed** – projects that will proceed, with known timing, satisfying all five of the commitment criteria. That is, all categories are green.
- **Advanced** – projects that are highly likely to proceed, satisfying four of the five commitment criteria. Typically included in sensitivity analysis for MLF and reliability assessments.
- **Maturing** – projects that have progressed with site, planning applications, and finance arrangements, but not to the point that they can be classified as advanced. Maturing projects may be explicitly included in scenario analysis to assess future reliability or market impacts and are tested for economic efficiency in capacity outlook modelling.
- **Emerging** – projects with financing arrangements, but site/planning approvals/construction is uncertain, and development is strongly subject to changes in policy or commercial environment. These projects may be explicitly included in scenario analysis to assess future market impacts, and are tested for economic efficiency in capacity outlook modelling. However, a higher weighted average cost of capital will be assumed to reflect greater development uncertainty compared to proposed projects.
- **Publically announced** – these projects have been announced publically, but do not yet have any finance arrangements in place. Costs and capabilities of these projects are developed using recently-completed projects and projections of cost components such as raw material supply and labour.

Additionally, the following minimum criteria must be satisfied for each classification:

	Committed	Advanced	Maturing	Emerging	Publically announced
Site	🟢	🟢	🟢	🔴	🔴
Components	🟢	🟡	🔴	🔴	🔴
Planning	🟢	🟡	🟡	🔴	🔴
Finance	🟢	🟡	🟡	🟡	🔴
Date	🟢	🟢	🔴	🔴	🔴

4. INFORMATION PUBLISHED

To preserve confidentiality, we will prepare different summaries for internal and external publication. Internally, AEMO will have the ability to access answers to the questions, the traffic light classification for each category by project, and aggregated summary by region.

Externally on AEMO's Generation Information Page, aggregated regional summaries of MW capacities will be reported by commitment status and by fuel, along with details and status of individual projects (but excluding any traffic lights).

Commercial use date to the nearest season will be reported for all projects that are committed and/or have made formal commitments for construction (or at a more granular level if not confidential). That is, for projects that:

1) Are "committed" based on our criteria, or
2) Have started construction, and are "advanced" based on our criteria.

DATA COLLECTION AND FUTURE PUBLICATION OF INFORMATION

30 January 2018

PRESENTED BY MATT MARSTON

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

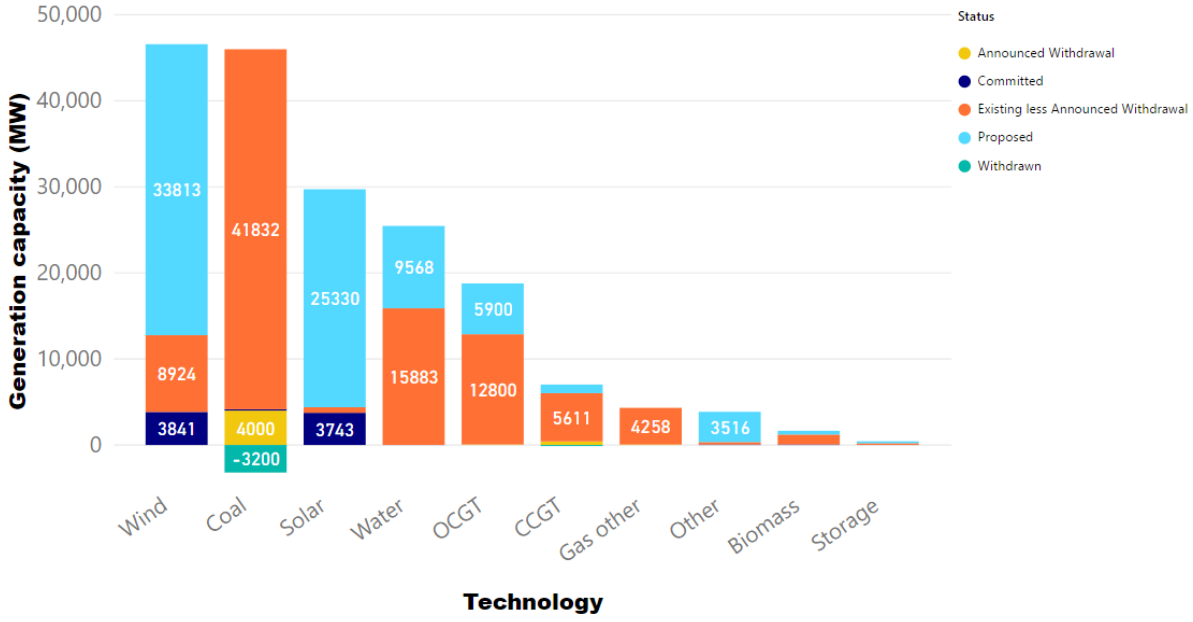
PRESENTATION OBJECTIVES

- Inform participants of additional generation information required
- Increase awareness of new data portal being developed to improve the customer experience
- Seek feedback on proposed changes to commitment status before implementing

NEW CHALLENGES

- To provide energy supply adequacy and reliability assessments, AEMO is increasingly reliant on technical data of an increasing granularity than has been requested and provided to date.

- New projects are becoming committed at an accelerated rate.



NEW QUESTIONS

- Increased clarity is sought on:
  - Operational characteristics of generating units
  - Site-specific operations at ambient temperatures
  - Further energy constraints, particularly reflecting budgeted or contract fuel arrangements
  - Future generation/battery projects, and level of certainty whether these will proceed

NEW COMMITMENT STATUS

- From 2018, we will be including a new commitment classification that represents projects “nearly committed”
  - Include in sensitivity analysis to provide insights around impacts
  - Include in longer term planning studies such as ISP, RIT-Ts.
- Change existing classifications to better capture levels of development uncertainty
- Include a Committed* classification for projects that have commenced construction, irrespective of AEMO commitment criteria.
- Publish details of projects (e.g. capacity, fuel type and region), including commitment classification
  - Aim to show prevailing location of future generation projects on a regional basis

NEW DATA PORTAL

- Developing a data portal to collect relevant information from participants
  - Objective is to make it easier for participants to provide this information in a timely manner
- Aim to roll out by July 2018
- Before the rollout AEMO is looking to host:
  - Participant trials, including feedback sessions
  - Participant training sessions, including walk through
  - Documentation, including “how to” guide for participants
- In February/March generation information update, we will be asking new questions to match our new commitment criteria

FORECASTING AND PLANNING REFENCE GROUP

Title	Integrated System Plan Update
Presenter	Craig Price, Group Manager, Power System Planning AEMO
Agenda Item:	5
Date:	Tuesday 30 January 2018

AGENDA ITEM 5 – INTEGRATED SYSTEM PLAN UPDATE

The context, focus and purpose of first Integrated System Plan (ISP):

- The merits of strategies based on scale size renewable zones (Finkel 5.1) relative to strategies reliant on market led investment in distributed resources (both embedded and transmission).
- The approach to re-engineer the power systems as existing thermal fleet reaches end of life and is replaced with generation in different parts of the power system and other alternatives (such as demand management).
- The technical requirements needed to manage future power systems.
- The need for any large scale investment in long-life long-lead time generation and transmission, under a low regret approach that balances risks of inefficient investment and stranding against timely investment to maintain reliability.
- The value created by networks to enable diversity of supply and storage and thereby improve reliability and reduce costs.