Obj Ref: A3310166

7 February 2020

Attention: Nicola Falcon

Australian Energy Market Operator (AEMO)

By Email: *forecasting.planning@aemo.com.au*

Dear Nicola,

Powerlink Queensland Submission

2020 Planning and forecasting consultation on scenarios, inputs and assumptions

Powerlink Queensland (Powerlink) welcomes the opportunity to provide input to the 2020 Planning and Forecasting consultation on scenarios, inputs and assumptions.

Powerlink is cognisant of the great challenge and importance of compiling the inputs which will ultimately provide the plans for the efficient and secure operation of the National Electricity Market.

Powerlink already provides feedback to AEMO as an active participant in Forecasting Methodology Workshops and member of AEMO's Forecasting Reference Group (FRG). However, we would like to use this opportunity to highlight three key concerns with the consultation information in relation to:

1. Forecast decline in rooftop PV and PV non-scheduled generator installations
2. Temperature sensitivity of Queensland demand
3. Use of a single weather station for Queensland.

These matters are addressed in more detail in the attached submission.

If you have any questions in relation to this submission or would like to meet with Powerlink to discuss this matter further, please contact Steven Rawlins.

Yours sincerely

Tim Byrne

A/Executive General Manager, Delivery and Technical Solutions

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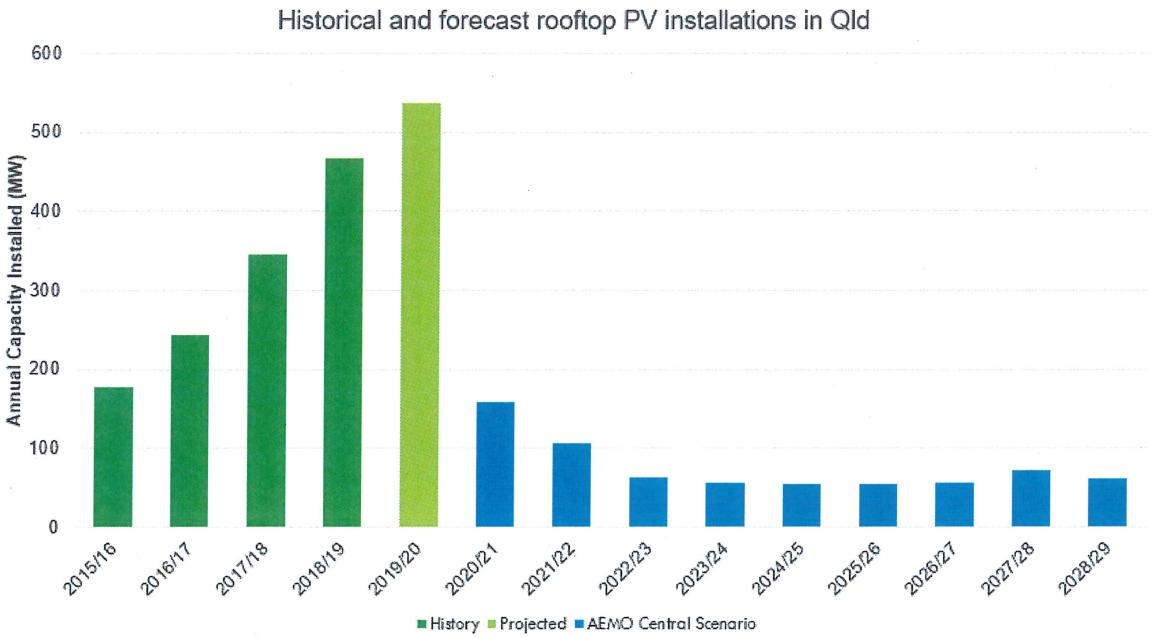
1. Forecast decline in rooftop PV and PV non-scheduled generator installations

Whilst industry has traditionally been concerned with maximum demand, rooftop PV and larger PV non-scheduled generator (PVNSG) installations are creating new challenges as traditional baseload generation struggles to remain online during times of minimum demand. AEMO's 2020 Draft ISP quotes the need for urgent technical and market integration (page 78), where feed-in management capability may need to be mandated on distributed PV to maintain power system security (page 39).

CSIRO's forecasts, used in all except the High DER scenario, forecast a sharp decline in the annual installation of residential rooftop PV and PVNSG in the face of recent record levels of installations. The figure below contrasts recent history of year on year growth rates of approximately 30 to 40% p.a. with the expectations of CSIRO's modelling.



Sources: Australian PV Institute (APVI) Solar Map, funded by the Australian Renewable Energy Agency, accessed from pv-map.apvi.org.au on 6 February 2020, 2019 Input and Assumptions workbook v1.3

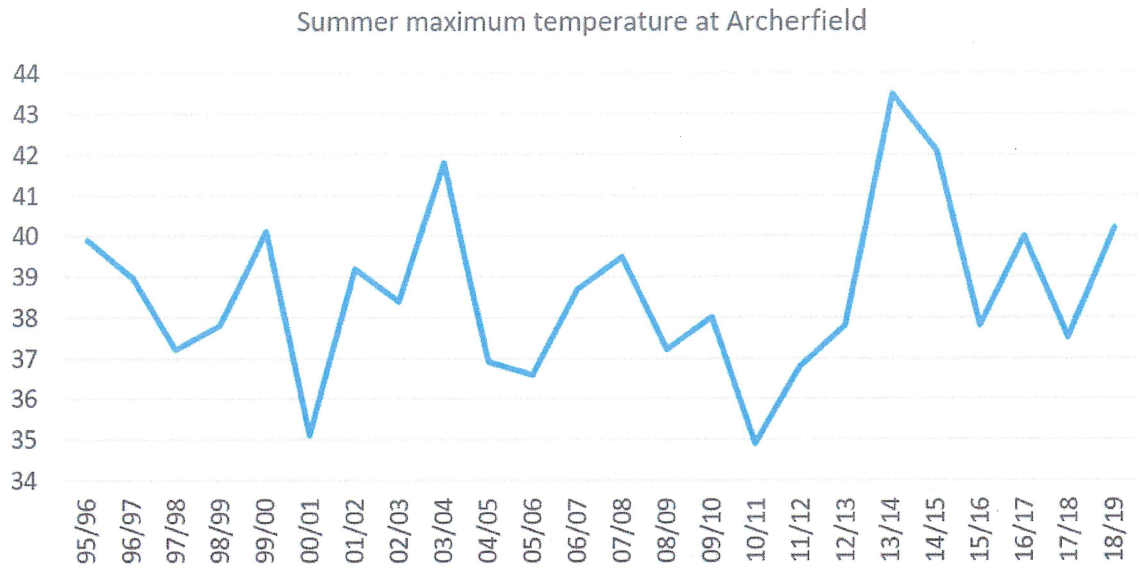
Although CSIRO's modelling justifies the reductions as due to expected changes in subsidies and lowering of retail prices. Delays in the expected decline in installations would have significant consequences on the rate of decline of minimum day-time demand and associated system performance and operability issues. The model may be relying on actions which can only take place after issues are identified, thereby masking imminent problems.

Powerlink recommends CSIRO review its model and inputs and err on the side of additional installation to allow for the subsequent analysis to identify emerging performance and market impacts and help prioritise actions accordingly. AEMO should consider the continuation of high installation rates as sensitivities in its analysis.

10% POE to 90% POE Maximum Demand

AEMO's difference in summer maximum demand between 10% POE and 90% POE for the 2019 ESOO for the Queensland region is very low, in the order of 450MW. AEMO's difference within the 2018 ESOO was significantly larger, in the order of 700MW. The narrow band within the 2019 ESOO would indicate that the summer maximum demand for Queensland is relatively predictable.

Observations of the Queensland summer maximum demands would indicate that maximum demand is highly sensitive to the daytime temperature and there have been large variations in the peak temperatures from one summer to the next. The following graph shows the variation in maximum temperatures at the Archerfield weather station (AEMO's regional weather station for Queensland) over the past 24 summers.



AEMO's narrow band between 10% POE and 90% POE also appears to contradict their statement within the Summer 2019 Forecasting Accuracy Update, which notes: "The electrical demand from Queensland, has become more volatile over the last few years, with a single period of high demand throughout summer."

In light of these concerns, Powerlink requests that AEMO review the maximum demand spread between 10% POE and 90% POE within Queensland.

Weather Correction

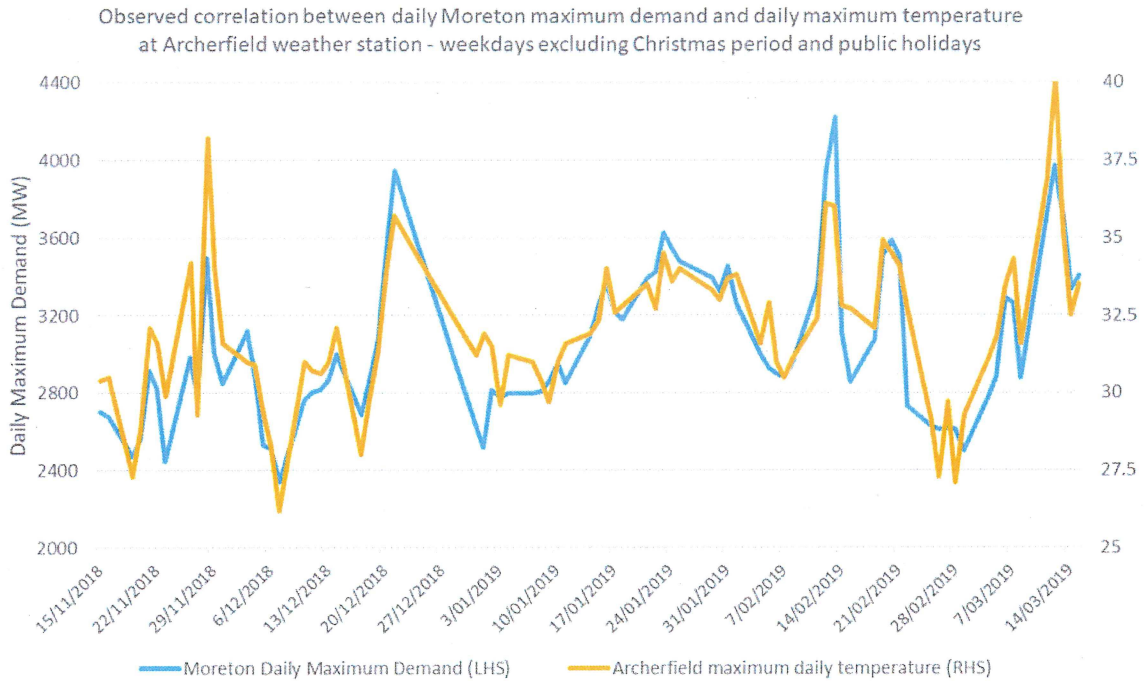
Powerlink's network, extends 1,700 km from Cairns to the New South Wales border with more than half the load residing outside of the Brisbane metropolitan area. Due to the physical size and distribution of load within Powerlink's network, Powerlink considers a single weather station to undertake weather correction analysis for the Queensland region to be an unreasonable approach.

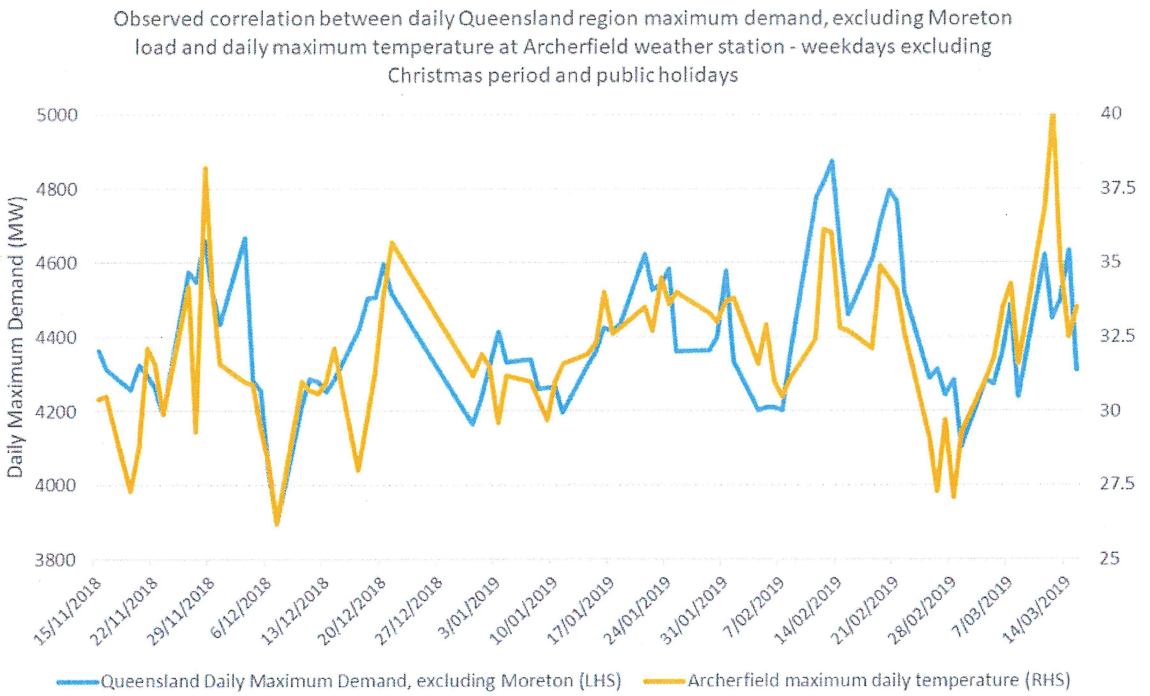
It appears that AEMO's 2019 ESOO uses a single weather station approach for the Queensland region for simplicity. Within AEMO's 2019 Forecasting Accuracy report and 2019 Summer Forecasting Accuracy report, the only temperature reference for Queensland is from the Archerfield weather station.

Powerlink has presented the benefits of a multiple weather station correction approach within the Forecasting Methodology workshop. Subsequent analysis by AEMO and shared with the FRG showed results were more accurate with multiple weather stations for the Queensland region.

While weather station data such as maximum and minimum temperature, may provide a good correlation with electrical demand, this correlation reduces as the distance between the weather station and the demand increases. This is due to the difference in the weather patterns that the weather station is observing and the actual weather pattern at the location of the electrical demand. This is illustrated in the following graphs. The first graph includes the Archerfield daily maximum

temperature (used by AEMO) with the daily maximum demand of the Moreton zone (as defined within Powerlink's 2019 TAPR – Appendix C). In the second graph, the daily maximum demand of the Moreton zone is replaced with the Queensland region load excluding the Moreton zone. As the Archerfield weather station is located in the centre of the Moreton zone, the first graph shows strong correlation between load and temperature. However, due to the large distances between the Archerfield weather station and location of the remaining Queensland load (excluding Moreton), the second graph shows poorer correlation between load and temperature.





The correlation between load and demand outside the Moreton zone can be improved with additional weather stations within the weather correction process.

Powerlink requests that AEMO gives further consideration to the benefits of multiple weather stations for the Queensland region within their current forecasting methodology, to ensure that the correct trade-off is made between forecasting accuracy and complexity.

Powerlink is happy to provide additional detail on our weather correction processes.