

AEMO INSIGHTS

NOVEMBER 2016



Market insight report – Victoria's supply outlook

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Introduction

This Insights report provides a preliminary assessment of some of the potential impacts of the closure decision Hazelwood Power Station. Further investigation is required to gain a deeper, more holistic understanding of scenarios whereby the power system is operating with less synchronous generation.

As part of its role, AEMO is providing the market with continuous updates in relation to the future supply/demand balance via the Medium Term Projected Assessment of System Adequacy (MT PASA). AEMO will also prepare an update to the 2016 National Electricity Market (NEM) Electricity Statement of Opportunities (ESOO) and the Energy Adequacy Assessment Projection (EAAP).

The reliability standard

The NEM reliability standard sets an expectation that demand will be met 99.998% of the time, i.e. supply can be at risk for 11 minutes per year, on average, usually at times of peak demand. The NEM is designed to deliver this level of reliability through market trading mechanisms.

Victorian electricity supply

In 2015-16, Victorian generation provided 27% of the NEM's total operational consumption (46,170 Gigawatt hours (GWh) out of a total of 195,846 GWh of energy). About 86% of this was produced from brown coal generation, while wind, hydro and gas-fired generation made up the remainder of Victoria's electricity supply. Total Victorian generation exceeded the needs of the region, with 6,576 GWh of surplus energy exported via transmission networks to neighbouring regions, such as New South Wales, South Australia and Tasmania.

Surplus Victorian generation provides a cost-competitive alternative to New South Wales black coal generation and South Australian gas-fired generation. It also supports Tasmania at times of low hydro generation availability.

In 2015-16, through exports, Victoria provided:

- 14% of South Australia's operational consumption.
- 6% of New South Wales' operational consumption.
- 6% of Tasmania's operational consumption¹.

The 1,600 MW Hazelwood Power Station accounts for about:

- 14% of total firm capacity² in Victoria,
- 12% of the combined firm capacity across Victoria and South Australia, and
- 4% of the total firm capacity installed in the NEM.

Last year, it produced 10,326 GWh (22% of Victoria's operational demand) of electricity.

The closure of this power station in *March 2017*, is expected to reduce the surplus generation Victoria has traditionally exported. Instead, it is projected that New South Wales black coal generation and South Australian gas-fired generation will increase output to supply over 90% of consumption previously met by Hazelwood.

During periods of high demand, more gas-fired generation in Victoria and New South Wales may also be required. For the purpose of this assessment, AEMO has assumed that gas-fired generation can access gas and pipeline capacity.

¹ The proportion of Tasmania's operational consumption may have been higher had the Basslink Interconnector not been out of service from December 2015 to June 2016.

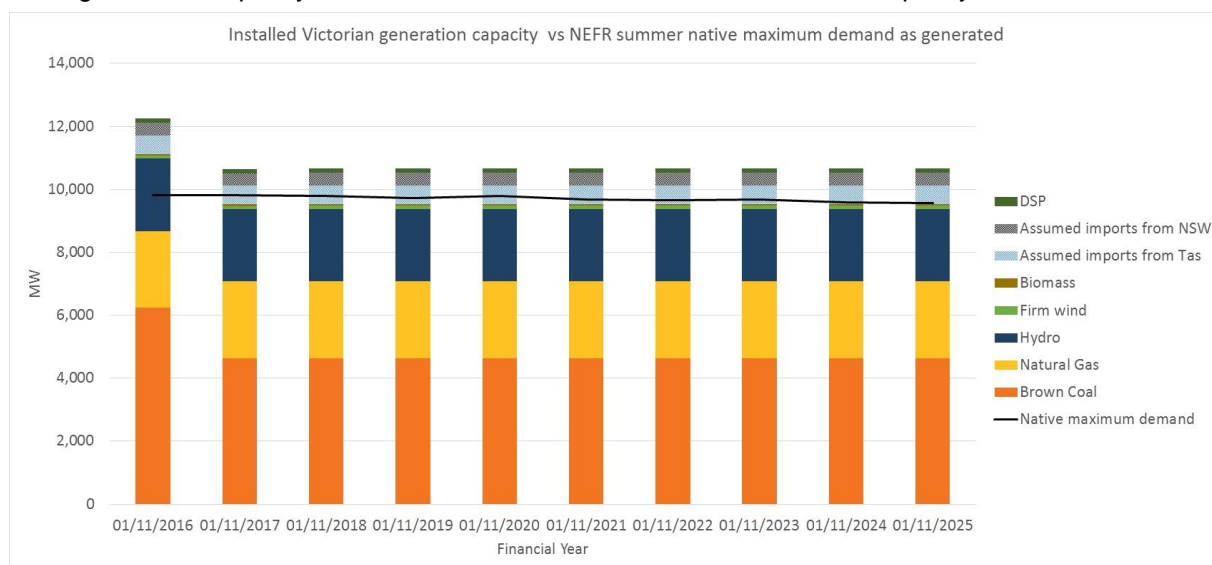
² Firm capacity is the capacity AEMO conservatively assumes will be available during peak demand conditions (with 85% confidence of exceedance). In Victoria, wind generation capacity is currently discounted 93% in this calculation.

Impact of Hazelwood withdrawal on supply reliability

From a reliability perspective, it is the firm capacity of generating plant, rather than the energy balance, that is important in the NEM. AEMO expects that there will be sufficient capacity available to continue to operate the NEM reliably following the retirement of the Hazelwood Power Station next year.

This view has been formed through high level modelling and analysis of expected capacity reserves, and is based on generation capacity information provided by industry to AEMO as at 27 September 2016.

The following figure shows AEMO’s current Victorian generator capacity forecast (including the withdrawal of Hazelwood) against the Victorian average summer and extreme summer peak demands, and assumes a specified level of imports from Tasmania (590 MW) and New South Wales (400 MW)³. Wind generation capacity has been discounted in these estimates of firm capacity.



This figure is provided for illustration only, as it is not possible to assess reliability by simply comparing generation capacity against maximum demand in a single region. Victoria is also supported by transfers from Tasmania and NSW, suffers random plant failures, and, depending on weather diversity, may support or be supported by, South Australia.

After Hazelwood Power Station retires in *March 2017*, expected firm capacity reserves⁴ in Victoria are projected to reduce to -145 MW in summer 2017-18 at times of peak demand. Imports from New South Wales or Tasmania will be required to meet demand under these conditions. Given that temperature conditions in Victoria and South Australia tend to be correlated, it is unlikely that supply from South Australia could be relied upon to support Victoria during high demand periods.

Expected firm capacity reserves in New South Wales and Tasmania are 2,011 MW and 1,057 MW, respectively. Therefore, availability of supply from these regions is expected to be sufficient to support Victoria, up to the limit of the interconnector capability, when required. 76 MW of expected firm capacity reserves are projected in South Australia.

Under even more extreme temperatures, low wind conditions or an unfortunate coincidence of generation outages, transmission outages, or both, these capacity reserves will be further eroded and a market response may be required.

³ The total power flowing on the transmission lines from New South Wales to Victoria is a combination of New South Wales imports and Murray generation. The 400 MW import level assumes Murray is generating a full capacity.

⁴ That is, capacity reserves calculated based on the expected weighting of 10% probability of exceedance and 50% probability of exceedance maximum demand projections.

Market response

AEMO will be informing the market of the future supply/demand balance outlook and highlighting opportunities for generation investment where appropriate through the following means:

- AEMO will publish an update of its ES00 report, which provides a detailed analysis of the supply/demand balance in each region for the next 10 years.
- AEMO will publish an EAAP, which provides detailed energy availability analysis for the next two years.
- AEMO will also consider publishing an update to its Gas Statement of Opportunities to inform the market of projected increased gas consumption due to heightened operation of gas-fired generation.
- To provide a medium term outlook, AEMO's Medium Term Projected Assessment of System Adequacy provides a weekly update of the supply/demand balance in each region over the next two years, based on generation availability provided by plant owners. Regional generation availability is also updated and published every three hours to inform the market of changes.
- In the short term, AEMO's Short Term Projected Assessment of System Adequacy provides supply/demand balance information to half-hourly detail over the following week.
- The market price outlook is updated half-hourly and covers the period to the end of the following day.

These reports from AEMO assist generating plant owners to schedule their maintenance at appropriate times, and inform potential investors of future opportunities. As such, they act to encourage an efficient market response to the closure of any plant. Those market responses relate to both generating plant and procurement of gas for the increased operation of gas-fired generation, where necessary.

Given that the withdrawal of Hazelwood Power Station has been announced in late 2016 and the plant's exit from the NEM takes place at the end of *March 2017*, this notice period is a key opportunity for NEM participants to respond to the announcement by adjusting their gas and electricity portfolios. The notice period is also valuable from an investment perspective as it provides an opportunity for supply side options to emerge.

Commercial procurement of additional reserves

If the market does not respond with sufficient supply to meet the anticipated electricity demand, AEMO has the option of calling for offers for the provision of energy reserves from supply and demand-side facilities. This mechanism is called the Reliability and Emergency Reserve Trader (RERT). It allows AEMO to enter into commercial agreements with service providers through either a competitive tender process or a call for members of a RERT panel that can be activated by AEMO at shorter notice.

AEMO will be assessing the need for additional reserves to cover future high demand periods, and encouraging additional interest in participation in the long-notice RERT process as a risk mitigation measure, if necessary.

Emergency management

While responses to market signals, and if necessary, the use of the RERT mechanism can be expected to be adequate to cover most circumstances, infrequent, but high risk events can materially impact the reliability of supply.

For example, heatwave conditions in Victoria and South Australia over a period of three days or more (as might occur in a 1-in-10-year summer), coinciding with low wind conditions, or bushfires, and the potential for high temperatures to reduce the effectiveness of transmission and generating plant, could result in a supply shortfall even without the withdrawal of large plant, such as Hazelwood Power Station.

In this situation, AEMO would initiate processes under its Power System Emergency Management Plan (PSEMP) with the relevant jurisdictional bodies to coordinate an industry response.

Conclusion

It is AEMO's considered view that the NEM will continue to operate reliably after the 1,600 MW Hazelwood Power Station withdraws from service by the end of *March 2017*, however the supply/demand balance will be tighter during times of peak demand.

From summer 2017-18, under unusually hot weather conditions (resulting in a 1-in-10-year peak demand), additional supply or demand response may be required to meet all projected demand in Victoria and South Australia, particularly if these conditions coincide with low wind availability, or generation or transmission outages. It is expected normal market operation should be adequate to provide the required response in these circumstances.