

Submission from Climate Change Balmain-Rozelle¹
on the Hunter Power Project (Kurri Kurri Power Station)²

Derek Bolton, 8/6/2021

Summary

We oppose the development on the grounds of:

- *Falsified justification*

The report by which the project is purportedly justified does not arrive at the specific conclusion claimed.

- *Expert rejection*

Key bodies the report relies upon for its findings have publicly denied the need for the project.

- *Outdated basis*

Technological and regulatory developments since the report was prepared have significantly alleviated most of the concerns.

- *Technological non-neutrality*

Public money directed at a preordained solution to a problem displaces market-based alternatives. In this regard, it contravenes the advice in the report.

- *Externalities*

The financial analysis in the report does not appear to have applied any penalty either for greenhouse gas emissions or for direct health harm from fossil fuel exploitation.

- *Environmental Impacts*

Combustion of methane gas produces greenhouse gases.

The extraction and piping of fossil gas always results in fugitive emissions. Even a few percent wipes out any GHG advantage over coal.

Past experience says fugitive emissions will be underestimated and underreported. CSIRO notes that they are difficult to assess accurately³. By the time these are assessed properly and remedied, years will have gone by and the net impact over ten years could well exceed that of equivalent coal power. Greenhouse emissions need to come down substantially before 2030.

In addition to the climate impacts, there are direct health harms. Methane leads to surface-level ozone. Combustion generates NO_x.

Prior to the completion of the pipeline, and occasionally thereafter, Diesel may be used. Diesel exhaust contains over 40 toxic compounds. Several have been identified as carcinogenic, with many more suspected⁴.

The EIS, of course, concludes that all the harms are "within guidelines". But guidelines assume the project has significant value in other ways. As demonstrated in this submission, this assumption is not met. In consequence, even the slightest health harm is unjustifiable.

¹ <http://www.climatechangebr.org/>

² <https://www.planningportal.nsw.gov.au/major-projects/project/40951>

³ <https://www.epa.nsw.gov.au/~media/EPA/Corporate%20Site/resources/air/methane-volatile-organic-compound-emissions-nsw-3063.ashx>

⁴ <https://www.atsjournals.org/doi/full/10.1164/ajrccm.183.10.1437>

Who we are and why we care

Climate Change Balmain-Rozelle Inc. was formed by a collection of residents in the Inner West of Sydney who came together out of mutual distress over Australia's excessive greenhouse gas emissions and the world our children will inherit.

While another gas peaker might help to reduce emissions in the short term, the CO₂ emissions from its use and the fugitive methane emissions from its supply mean it is not on the path to where we need to be: *limiting warming to 1.5°C.*

We count over 1000 supporters.

The Project's History

After a one year extension, the Liddell coal-fired power station is due to close in April 2023. It has a nameplate capacity of 2GW, but in recent years the ageing plant's peak output has only reached 1250MW⁵. The Federal Government established the Liddell Taskforce to examine the consequences and possible responses. The Taskforce published its report in April 2020.

The Report

Necessarily, the report is hedged around with assumptions concerning a long list of other developments which might or might not come to pass in the meantime, such as interconnectors and demand response. As befits, it is surely conservative in those regards, so a review of what circumstances have changed and how these may affect the business case for the project would be appropriate before forging ahead.

Examples include:

- The five minute settlement rule change⁹ coming into effect in October 2021;
- The likely construction of a NSW-SA interconnector⁶;
- The adoption of grid-forming capabilities at solar farms and wind farms¹¹, allowing them a greater share of the load;
- Options for making aluminium smelters more tolerant of extended outages.
- Announced plans for a 1200MW battery (hours unstated) at Kurri Kurri from 2023⁷.

Outdated basis

Closure Impacts

The report discusses three impacts of the Liddell closure: 'unserved demand' (blackouts), grid stability and the effect on power prices. It also considers a particularly demanding customer, an aluminium smelter.

- Unserved Demand

The report sees no threat of unserved demand:

"The 2019 [AEMO] ESOO indicates that with committed projects and the QNI and VNI [interconnector] upgrades, around 215 MW of new dispatchable supply would be required to ensure NSW only has a one-in-ten year risk of a significant involuntary load shed event in summer 2023–24, following a Liddell closure."

Expert Rejection

"There are further publicly announced projects from the private sector not included in AEMO and TransGrid's analysis, which could provide up to 1120 MW of firm capacity by 2023–24 if all were to proceed."

Outdated basis

- Instability

The report found no concern with losing the FCAS Liddell provides. Rather, AEMO and Transgrid see a need for greater flexibility and dispatchability. While a new peaking gas plant would assist here, it is unrelated to the loss of Liddell.

Batteries are already the cheaper option for covering periods of up to 30 minutes, as is

Outdated basis

⁵ NSW Department of Planning, Industry & Environment analysis of Liddell Power Station using NEM-Review

⁶ <https://reneweconomy.com.au/transgrid-commits-to-major-new-transmission-link-after-cefc-steps-in/>

⁷ <https://reneweconomy.com.au/cep-plans-worlds-biggest-battery-at-kurri-kurri-to-deflate-morrison-gas-dreams/>

often necessitated by the failure of a thermal generator in the summer heat, and they react with far greater speed and precision. The pace of technology suggests batteries will become the cheaper option for outages of several hours long before a new gas power plant would be due to retire.

The existing arrangements for rewarding FCAS are based on the what has been the available technology. These undervalue the level of FCAS batteries provide. As this is corrected, batteries will compete even more strongly with peaking gas.

Outdated basis

- Price

There are several reasons to suspect that the report overestimates the impact on price.

Outdated basis

The modellers would have been wary after the price impact of the earlier Hazelwood closure had been seriously underestimated. However, that seems to have been largely a result of an unexpected rise in gas prices, so hardly serves to justify building new gas plant to save money.

The report hints at the impact of bidding "behaviours" (code for gaming the system⁸), but there will be far less risk of that from October 2021 with the introduction of the five minute settlement rule⁹. The modelling would also have been developed before the ability of grid-scale batteries to deflate the FCAS market had been fully appreciated.

- Aluminium

Freezing Potlines

Aluminium smelters have a particular vulnerability: if the potlines fall below a critical temperature they freeze irreparably. Power loss for hours can be highly destructive.

"Tomago advised the Taskforce it is under pressure from current low aluminium prices and high delivered energy costs relative to its previous contracts and aluminium smelters in other countries."

Tomago is further exposed because its existing hedge contracts with AGL do not completely insulate it from price spikes, and the AEMO may instruct it to cut demand, without compensation, in order to avoid shedding other loads.

As noted above, price spikes should no longer be of such concern. This leaves the risk of inadequate supply for several hours.

Potline technology

Potlines can be made less vulnerable. In June 2020, an IEEFA report found that instead of closing the country's loss-making and high emitting aluminium smelters,

Outdated basis

"... these industries could transition rapidly to renewable electricity, invest in plant upgrades to support demand response management, and profit from the long-term growth of the metals and industrial processing markets."

"EnPot™ technology claims to increase modulation to +/-30% without any risk to the pots and the reduction in energy usage can last indefinitely"¹⁰

Indeed, it appears that the 3-hour limit on Tomago's current line is a commercial decision:

"Tomago's current cells are designed for maximum energy efficiency but this has the side effect of reducing their thermal reserve (from around 8 hours in previous generations to around 3 hours now) and therefore limiting the ability to provide demand side response."

The IEEFA report concludes that suitably remunerating Tomago for DSR, together with some technology upgrade, would not only allow it to tolerate much longer power loss but earn income in the process:

"if, however, Tomago could generate a better return by providing demand side response, investment in more robust, lower efficiency cells would be justified."

Curtailement of renewables

Part of the problem has been that solar and wind power have not provided inertia. As a result, they are not allowed to bear more than a certain fraction of the demand. When a large thermal generator fails, solar and wind may need to be curtailed too, increasing the need for peaking gas.

Once again, technology is coming to the rescue. Smarter inverters allow these renewable sources to be 'grid forming', i.e. helping to maintain frequency rather than slavishly following what it detects from the grid¹¹. This will allow these sources to continue to contribute fully, reducing the risk of extended periods of insufficient supply.

Outdated basis

8 <https://www.afr.com/politics/unacceptable-energy-grid-gaming-cost-australian-consumers-34b-20180629-h121oc>

9 <https://aemo.com.au/-/media/files/electricity/nem/5ms/program-information/2020/5ms-factsheet-updated-july-2020.pdf>

10 https://ieefa.org/wp-content/uploads/2020/06/IEEFA_Why-Aluminium-Smelters-are-a-Critical-Component-in-Australian-Decarbonisation_June-2020.pdf

11 <https://reneweconomy.com.au/inverters-are-solving-grid-issues-at-fraction-of-cost-of-spinning-machines/>

Divergence of Proposal from Report and its Sources

According to the Government's response¹², the Taskforce reported that 1GW of new dispatchable capacity would be needed by summer 2024. Given the planned Tallawarra B open cycle gas plant and other upgrades, that would leave a shortfall of 654MW.

However, the actual report¹³ makes no such specific recommendation. Rather, it lists a variety of options and their various pros and cons:

**Falsified
justification**

"The Taskforce has not recommended specific policy responses, but rather options, steps to progress those options, and a framework for deciding on action."

The proposal also violates the report's recommended decision framework:

**Technological
non-neutrality**

- **Do no harm:** government intervention should avoid raising investment risk and take into account potential impacts on other investments.
- **Evidence-based, efficient and effective:** Any intervention decision should be informed by evidence, including advice from market bodies, and be feasible, technology neutral, well designed, timely, avoid duplication and deliver value for money.

Edicting a new gas power plant as the solution is not technology neutral and displaces market-based solutions.

The sequence of events should be noted clearly. First, the Government called for the market to step up, but without proposing any incentives. The deadline having expired, the Government appears to have ignored the market responses that covered most of the perceived problem and now proposes massive incentives for the solution of its preference. Incentives for a market-based solution, let alone incentives prioritising low emissions, were never on the table.

Energy Security Board

There already exists an independent authority, the Energy Security Board, whose job it is to anticipate the needs of the power grid and ensure the market fulfills these. The ESB has also declared this intervention redundant¹⁴.

Expert Rejection

AEMO

The Government claims to base the proposal on the report, which in turn draws heavily on advice from the Australian Energy Market Operator. Remarkable, then, that the AEMO expressly denies the need for such a project:

*"The Australian Energy Market Operator ... finding there is no need to replace the exiting Liddell coal plant in 2023 because the gap to ensure grid reliability was only 154MW, and that has already been covered by other commitments."*¹⁵

Expert Rejection

So why this proposal?

A clue is here¹⁶:

"To give you a sense of how much it is needed in the market, in the last week, Sabra, we have seen the Tomago smelter, the biggest electricity consumer in Australia, have to shut 600 megawatts – the equivalent of this generator – three times because there wasn't enough power available" - Angus Taylor, ABC interview

**Falsified
justification**

Well, no, Tomago did not have to shut 600MW; the operators chose to avoid price spikes. Moreover, the spikes were suspicious, not being based on any actual shortage¹⁷. With that suspicion falling specifically on the bidding behaviour of gas peakers, the Kurri Kurri gas peaker concept appears to be like bringing down

¹² <https://www.energy.gov.au/government-priorities/energy-markets/liddell-taskforce>

¹³ [https://www.energy.gov.au/sites/default/files/Report of the Liddell Taskforce.docx](https://www.energy.gov.au/sites/default/files/Report%20of%20the%20Liddell%20Taskforce.docx)

¹⁴ <https://www.theguardian.com/environment/2021/apr/30/australian-energy-board-chair-says-gas-fired-power-plant-in-hunter-valley-doesnt-stack-up>

¹⁵ <https://www.theguardian.com/australia-news/2021/may/19/coalitions-600m-gas-fired-recovery-boost-what-you-need-to-know>

¹⁶ <https://www.minister.industry.gov.au/ministers/taylor/transcripts/interview-sabra-lane-abc-am-2>

¹⁷ <https://reneweconomy.com.au/energy-retailer-asks-accc-to-probe-possible-market-gaming-in-nsw/>

the cost of Highway Robbery by adding more Highway Robbers to the market.
The five minute settlement rule is overdue.

Outdated basis

Emissions Cost

With its conservative stance, the report finds:

"The modelling suggests Liddell's planned closure could lead to a NSW wholesale price increase from the low \$60s per MWh in 2022 to between \$75 and \$80 per MWh in 2023–24, depending on the market response to deliver new capacity."

As noted above, there are numerous reasons that is likely an overestimate now.

Outdated basis

On the other side of the ledger, no accounting is made for the climate and direct health costs, neither from the combustion of the gas nor from the fugitive emissions from its supply. The Minister for Emissions Reduction appears to have omitted those from the Taskforce's Terms of Reference.

Externalities

Glossary

Acronym	Expansion	Description
AEMC ¹⁸	Australian Energy Market Commission	The rule maker for Australian electricity and gas markets
AEMO ¹⁹	Australian Energy Market Operator	The manager of the electricity and gas systems and markets
DER	Distributed Energy Resource	Rooftop solar, domestic batteries
DSR	Demand Side Response	An energy consumer cutting demand when supply is low
FCAS	Frequency Control and Ancillary Services	Monetised generator behaviours that keep the grid stable
IEEFA	Institute for Energy Economics and Financial Analysis	
NEM ²⁰	National Electricity Market	Wholesale market operated by AEMO across ACT, Qld, NSW, Vic, Tas, SA
QNI	Qld-NSW Interconnector	
VNI	Vic-NSW Interconnector	

¹⁸ <https://www.aemc.gov.au/>

¹⁹ <https://www.aemo.com.au/>

²⁰ <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem>