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10 June 2022

NSW POEO (Clean Air) Regulation 2022

The Australian Energy Council ('AEC') welcomes the opportunity to make a submission to the NSW Environment Protection Authority's ('NSW EPA') consultation on the POEO (Clean Air) Regulation 2022 ('Draft Clean Air Regulations').

The Australian Energy Council is the peak industry body for electricity and downstream natural gas businesses operating in the competitive wholesale and retail energy markets. AEC members generate and sell energy to over 10 million homes and businesses and are major investors in renewable energy generation. The AEC supports reaching net-zero by 2050 as well as a 55 per cent emissions reduction target by 2035 and is committed to delivering the energy transition for the benefit of consumers.

The AEC understands that the primary effect of the Draft Clean Air Regulations on electricity generation will be the tightening of air emissions limits. There are real concerns the new limits being proposed for NO_x are unattainable without generators either retrofitting expensive and additional NO_x abatement technology or materially reducing their generation output. Both these outcomes would have adverse consequences for the energy transition in New South Wales ('NSW') at a time where the market is experiencing unprecedented volatility.

Even in a less volatile market, the AEC does not consider the reforms to be necessary. The main sources of NO_x emissions in the Sydney region are wood heaters and transport. There are limited policies to contain these sources and, at least in transport's case, emissions are expected to grow over time. Meanwhile, all air emissions from coal-fired power stations, including NO_x emissions, are gradually [declining](#).¹ In NSW, the implementation of the NSW Electricity Roadmap will accelerate this decline with most of NSW's coal generation fleet projected to be phased out within the current decade. Given the changes to NO_x limits will not take effect until 2025 (followed by further tightening in 2030), the material health benefit is doubtful, and likely to be well outweighed by the impacts it will have on electricity affordability and reliability.

Draft Clean Air Regulations – Proposed Changes to NO_x Limits

NO_x limits are currently regulated through the *Protection of the Environment Operations (Clean Air) Regulation 2021* (NSW) ('Current Regulation'). It is being proposed here that the Draft Clean Air Regulation will replace the Current Regulation.

The Current Regulation requires electricity generators to comply with a maximum air emissions limit for NO_x emissions of 2,500 mg/m³. The NSW EPA has the option to impose tighter limits on electricity generators through their environment protection licences ('EPL'). This option has been exercised meaning NSW electricity generators face much tighter limits in the EPLs than what is in the Current Regulation. The Draft Clean Air Regulations intend to tighten these limits further and require generators to comply with:

¹ Australian Energy Council, 'Plant Emissions at Five-Year Low: NPI Data Shows', April 2022, <https://www.energycouncil.com.au/news/plant-emissions-at-five-year-low-npi-data-shows/>.

- 800 mg/m³ by 1 July 2025; and
- 500 mg/m³ by 1 July 2030.

The AEC believes these limits are not achievable unless electricity generators:

- Install expensive and additional NOx abatement technology at their respective plants.
- Materially reduce their generation output.

Given the current state and future direction of the NSW electricity market, the AEC does not consider either of these actions to be reasonable because it will disrupt the affordability and reliability of electricity supply.

State and Direction of the NSW Electricity Market

Each year, the Federal Department of Industry, Science, Energy, and Resources (DISER) publishes an Emissions Projections document for the decade ahead. The [2021 Emissions Projections](#) forecasts carbon emissions from the electricity sector to substantially decline through this decade. Figure 1 below (sourced from the Emissions Projections) shows how these emission reductions will be spread across each state.²

Figure 1: Electricity Emissions (Mt CO₂-e)

Emissions by grid	2005	2019	2025	2030
National Electricity Market	176	150	100	64
<i>Queensland</i>	46	50	36	33
<i>New South Wales/ACT</i>	58	52	33	9
<i>Victoria</i>	63	44	31	20
<i>South Australia</i>	8	4	1	1
<i>Tasmania</i>	<1	<1	<1	<1
Western Australia Wholesale Electricity Market	11	11	10	8
Other grids, including off-grid	10	19	17	17
Total electricity sector	197	179	127	88

Note: totals do not sum due to rounding.

As can be inferred from the NSW numbers, most of NSW's coal generation fleet is projected to close by 2030 and this will help achieve substantial reductions in all air emissions, including NOx. This accelerated closure is being driven by the NSW Electricity Roadmap and requires careful planning between the government, Australian Energy Market Operator (AEMO), and generators to minimise disruption to electricity supply. Both these features – accelerated closure and precise market planning – were illustrated earlier this year when AEMO revised its [Electricity Statement of Opportunities](#) to accommodate Origin Energy bringing forward the closure of Eraring to – at earliest – 2025. This accelerated closure resulted in AEMO forecasting a breach in the reliability standards from 2025 of almost 600 MW in NSW.³

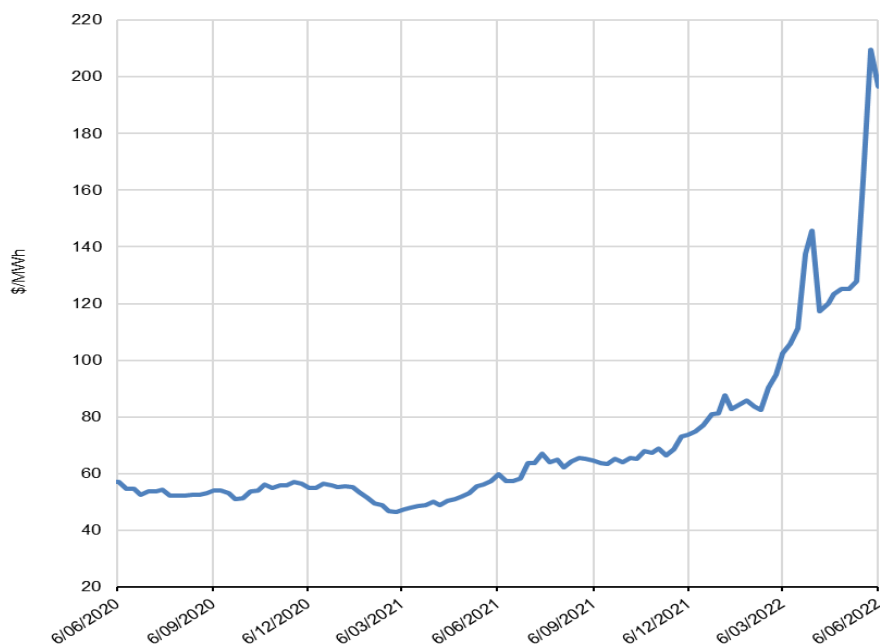
² Department of Industry, Science, Energy, and Resources, 'Australia's Emissions Projections 2021', October 2021, p18.

³ Australian Energy Market Operator, 'Update to 2021 Electricity Statement of Opportunities', April 2022, p12.

Eraring is not the only power station to bring forward its closure date, and it can be reasonably expected that other power stations will do the same as economic and technical considerations accelerate their closure.

As is being witnessed now, the amount of available generation capacity affects the wholesale price of electricity (and ultimately, the price of electricity that retailers offer customers). A culmination of factors, one of which is reduced capacity due to unplanned outages at coal generation plants and sub-optimal weather conditions for renewable generation, has seen the wholesale price increase dramatically. The figure below shows this increase in NSW.

Figure 2: Baseload Wholesale Prices in NSW



These high wholesale prices are expected to continue for some while, placing cost-of-living pressures on customers. There is a real risk that these prices and reliability forecasts could be exacerbated further if the Draft Clean Air Regulation proceeds in its current form and limits available generation capacity. For example, modelling from AEMO last year – before Eraring brought forward its closure – concluded that the unplanned early closure of Vales Point would ‘pose substantial risk to consumers as there would be little time for the market to respond’.⁴

Feasibility of Additional NOx Abatement Technology

The AEC is not able to comment on the feasibility of additional NOx abatement technology at individual generation sites. Members will comment on this separately and the AEC understands some have already begun the feasibility process in line with their licence requirements. Nevertheless, the AEC did commission an independent consultant in 2020 to prepare a report about the *Considerations for Retrofitting Emissions Control Systems in Australian Coal Power Plants*.⁵ The report can be found online [here](#).

⁴ Australian Energy Market Operator, ‘2021 Electricity Statement of Opportunities’, August 2021, https://aemo.com.au/-/media/files/electricity/nem/planning_and_forecasting/nem_esoo/2021/2021-nem-esoo.pdf?la=en.

⁵ WSP, ‘Considerations for Retrofitting Emissions Control Systems in Australian Coal Power Plants’, September 2020, <https://www.energycouncil.com.au/media/dtyjfdh/addendum-and-report.pdf>.

This report modelled various scenarios for installing additional abatement technology, including the installation of selective catalytic or non-catalytic reduction (SCR/SNCR) at black coal power stations (like in NSW). NSW coal power stations already have low NOx burners installed to help control and reduce their NOx emissions. To meet the proposed limits in the Draft Clean Air Regulations, generators would be required to install additional SCR/SNCR technology.

The WSP report estimated the costs to install additional SCR abatement technology based on the plant capacity of a black coal power station with a low NOx burner installed.

Table 1: Estimated Costs of Installing SCR Abatement Technology (per generation unit)

Plant Capacity (Black Coal)	Incremental CAPEX	Incremental OPEX (annual)
350MW	\$51.2 million	Reagent: \$3.2 million Catalyst: \$372k - \$867k Maintenance: \$768k
450MW	\$58.6 million	Reagent: \$2.6 million Catalyst: \$440k - \$1 million Maintenance: \$878k
720MW	\$88.8 million	Reagent: \$5.2 million Catalyst: \$728k - \$1.7 million Maintenance: \$1.3 million

Source: WSP Report, page 40.

This means that for a station like Eraring, which has four 720MW units, the costs would be multiplied by 4. These costs are prohibitively high and substantially overshadow the NSW EPA's estimated total abatement costs of \$63.7 million. There is no detail on the cost assumptions the NSW EPA has used to reach this figure so the AEC cannot comment on why there is such a large discrepancy in the two estimates.

The cost burden that WSP estimated did not include loss of revenue associated with being offline during the retrofit period. WSP noted in their report that NSW power stations may not have enough space in their existing design to retrofit a SCR catalyst section: 'to retrofit a system into an existing plant, extensive ducting modifications may be required to accommodate the catalyst'.⁶ With generators already nearing their end of life, these operational constraints would make it wholly uneconomical for a generator to commit to a lengthy outage period regardless of the initial capital expenditure.

Notwithstanding the costs involved, there are other practical constraints that require attention. It is probable that all NSW coal power stations would require additional NOx abatement technology to reliably meet the proposed limits. This would mean that, even in the most optimistic circumstance, most of NSW's coal generation fleet would be offline for large periods over the next three years. Given the AEMO reliability forecast to 2025, and the high wholesale price, these outages would be untenable and place unsustainable pressure on the reliability and affordability of the electricity grid.

The ability of generators to meet the proposed limits is made further challenging by the elongated process generators must go through before performing a retrofit. This includes the need for each individual plant to undertake a feasibility assessment at their site; develop and obtain revised

⁶ WSP, 'Considerations for Retrofitting Emissions Control Systems in Australian Coal Power Plants', September 2020, <https://www.energycouncil.com.au/media/dtyjfdh/addendum-and-report.pdf>, p43.

development consents under the *Environmental Planning and Assessment Act 1979* (NSW) – a process that usually requires at least two years; and access specialised plant, equipment, and personnel to perform the retrofit. The highly specialised nature of the equipment and personnel required means it is often sourced internationally, which is currently difficult due to global supply constraints.

The AEC considers then that any additional installation of abatement technology, as far it relates to electricity generation, is not feasible and will result in a disorderly energy transition.

Material Curtailment of Electricity Generation

The alternative compliance action to installing additional NO_x abatement technology is for NSW generators to materially curtail their generation output. The AEC does not consider this to be a viable solution from any perspective:

- From an abatement standpoint, reduced generation output does not neatly translate to lower NO_x emissions concentrations and exceedances could occur even at low loads.
- From a technical standpoint, it may be impractical since coal-fired electricity generators cannot easily ramp up and down to meet demand.
- From an economic standpoint, the deteriorating economics of coal-fired electricity generation is already driving early closures and curtailment would only accelerate this.

The AEC considers then that generators being required to materially reduce generation output to meet the proposed limits would not represent good policy.

Other Considerations

While a full analysis is beyond this submission's scope, the NSW EPA should also weigh up how the Draft Clean Air Regulations will interact with other forms of generation that are anticipated to facilitate the energy transition. For example, the AEC understands that the burning of hydrogen can release NO_x and might in some situations exceed the proposed limits in the Draft Clean Air Regulation. AEMO, via its [Draft 2022 Integrated System Plan](#), has anticipated hydrogen to play some role in the transition to net-zero and it would be undesirable for investment in this generation to be inadvertently chilled by these reforms.

The AEC would welcome the opportunity to facilitate a meeting between the NSW EPA and NSW electricity generators to better understand the assumptions behind, and impacts of, these reforms.

Any questions about this submission should be addressed to Rhys Thomas, by email [\[redacted\]](#) or mobile on [\[redacted\]](#)

Yours sincerely,



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