

# Submission to Portfolio Committee number 7, Planning and Environment Inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021

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Doctors for the Environment Australia (DEA) is an independent, self-funded, non-government organisation of medical doctors in all Australian states and territories.

DEA's work is based on the premise that humans need a future with clean air and water, healthy soils capable of producing nutritious food, a stable climate, and a complex, diverse and interconnected humanity whose needs are met in a sustainable way. We are therefore interested in environmental protection and restoration to promote human health and social stability.

DEA's work is supported by a distinguished Advisory Committee of scientific experts whose knowledge of medical and public health issues is fully contemporary. Our members work across all specialties in community, hospital, and private practices.

## Introduction

The health effects from exposure to air pollution are well established, and around the world this has led to the introduction of progressively tighter pollution regulations for industrial and vehicle pollution over the last four decades.

The principal health effects attributed to fine particles are increases in mortality, heart disease, stroke, lung cancer, diabetes, and poor fetal growth during pregnancy. The principal health effects from the irritant gases sulphur dioxide, ozone, and nitrogen dioxide are respiratory disease, notably asthma in children. For most of these exposure-disease associations there is no lower exposure limit that is considered safe, so reductions in exposure will lead to health benefits even when ambient exposures are within national guidelines.

The most significant health effects are due to chronic exposure. For mortality effects of PM 2.5 it has been demonstrated in hundreds of studies around the world, including some in Australia, that there are more deaths on bad air days. A typical example of this acute exposure effect showed that an extra 10ug/m<sup>3</sup> of daily pm2.5 led to an increase of 1.05% in daily mortality in the American Medicare population covering 22 million deaths<sup>1</sup>. The effect of chronic exposure is much greater. The generally accepted value is that an extra 10ug pm 2.5 leads to a 6% increase in annual mortality<sup>2</sup>. The annual effect is much greater than the sum of the daily effects.

The reason this fact is worth explaining to a parliamentary committee is that the regulations under the POEO set a limit for the peak concentration over a 1-hour period, but do not regulate the absolute annual output of the pollutant. The health effects are in proportion to the annual pollution output, not the concentration during the worst hour. This is a fundamental mismatch between the regulatory approach and the health impacts.

While NSW power stations all have effective fabric filters to stop fine particle pollution, none have the NO<sub>2</sub> and SO<sub>2</sub> controls required by regulations in the countries we usually compare ourselves to in Europe, North America or North Asia. Pollution from coal fired power stations causes a substantial health burden, estimated by various sources as causing 45, 279 or 477 deaths per year<sup>3,4,5</sup>. The health impacts from the two

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<sup>1</sup> Di Q, Dai L, Wang Y. Association of Short-term Exposure to Air Pollution With Mortality in Older Adults. *JAMA: The Journal of the American Medical Association*. 2017;318(24):2446-56.

<sup>2</sup> Pope C, Burnett R, Thun M. Lung cancer, cardiopulmonary mortality, and long-term exposure to fine particulate air pollution. *JAMA: The Journal of the American Medical Association*. 2002;287(9):1132-41.

<sup>3</sup> Broome RA, Powell J, Cope ME, Morgan GG. The mortality effect of PM2.5 sources in the Greater Metropolitan Region of Sydney, Australia. *Environment International*. 2020;137.

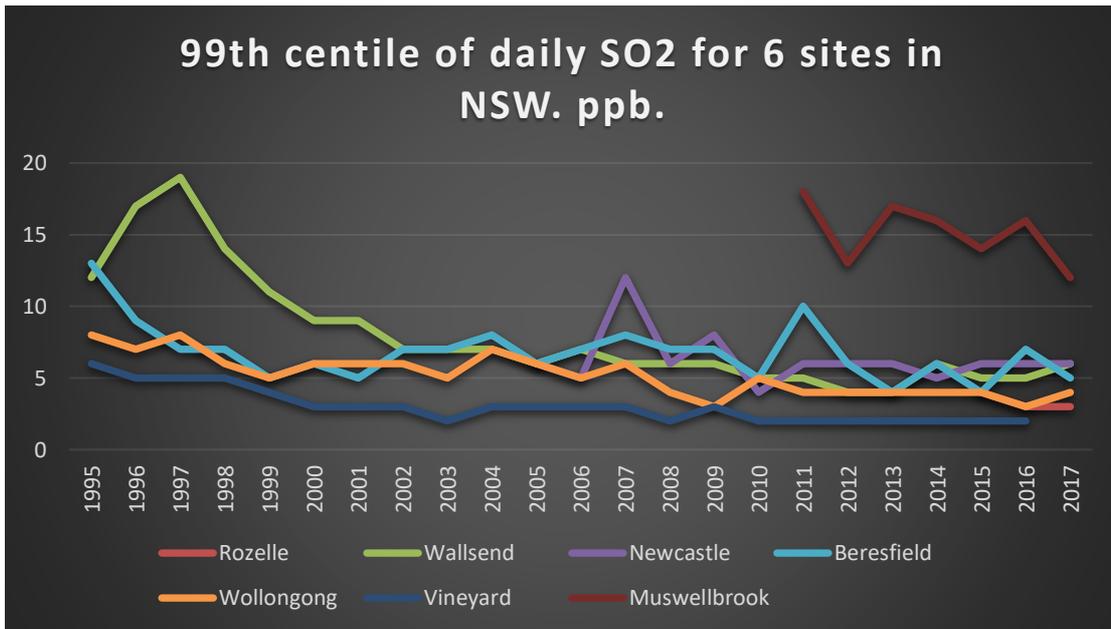
<sup>4</sup> Ewald B. The health burden of fine particle air pollution from electricity generation in NSW. Melbourne: Environment Justice Australia; 2018.

<sup>5</sup> Anhauser A, Farrow A. Lethal Power. How burning coal is killing people in Australia. Greenpeace Australia Pacific; 2020.

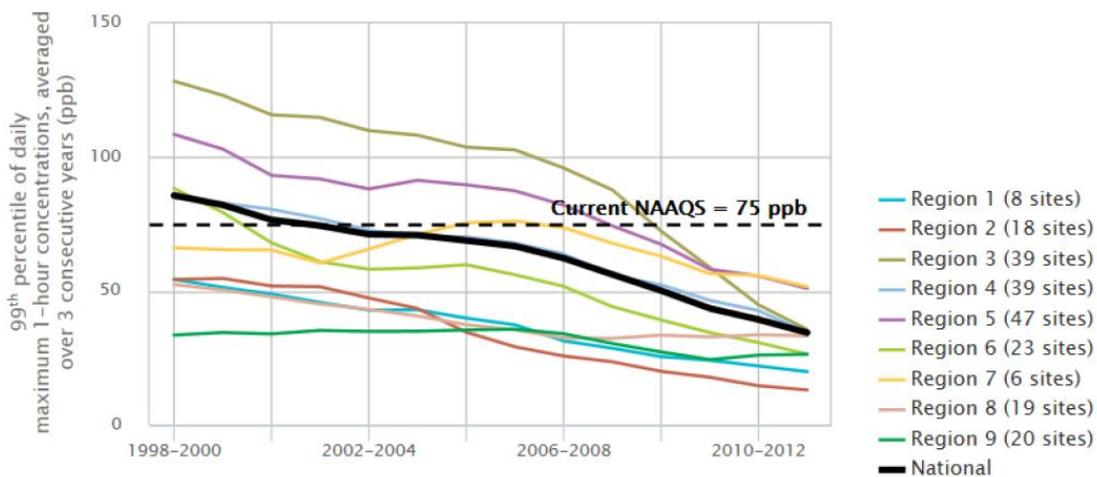
Lake Macquarie power stations are larger than the three others due to substantial local populations, and weather patterns that carry secondary particles to Sydney<sup>6</sup>.

**Australia has made less progress than other countries.**

The following figures show the long-term trends in sulphur dioxide exposure at NSW sites, and across the regions of the USA. In NSW the monitors at Wallsend and Beresfield showed a substantial decrease after the Newcastle coke ovens closed in 1999. Muswellbrook remains an outlier due to its proximity to Bayswater and Liddell. In the USA there has been progressive improvements over the same decades, largely due to enforcement of tighter standards for coal burning power stations.



**Exhibit 7. Ambient 1-hour SO<sub>2</sub> concentrations in the contiguous U.S. by EPA Region, 1998–2013**



<sup>6</sup> Crawford J, Cohen D, Atanacio A. The impact of closure of coal-fired power stations on aerosol concentrations in the Sydney Basin. Atmospheric Pollution Research. 2018.

## International comparison of power station pollution limits.

The limits set by the POEO allow much more pollution than would be acceptable in foreign jurisdictions. Table 1 shows the NSW standards for SO<sub>2</sub> are ten times higher than European standards for existing plant, and 23 times higher than is required for new plant. NO<sub>2</sub> standards are also ten times the European standard, while mercury release can be 250 times greater in NSW.

**Table 1. EPL limits for NSW power stations and selected international jurisdictions.**

	SO <sub>2</sub> mg/m <sup>3</sup>	NO <sub>x</sub> mg/m <sup>3</sup> equivalent NO <sub>2</sub>	Mercury mg/m <sup>3</sup>	Total Particles mg/m <sup>3</sup>
Bayswater	1760	1500	1	100
Liddell	1760	1500	1	100
Eraring	1760	1100	0.2	50
Vales Point	1760	1500	1	100
Mt Piper	No limit	1500	0.2	50
European  Comply by 2021	Existing plant 20-180.  New plant 20-75 annual average.	Existing plant 85-150. New plant 50-85 annual average.  Pre-2014 plant allowed 175.	Existing plant, coal 0.001 to 0.004, lignite 0.001 to 0.007	
South Korea	142	102		
Japan	68	57		

The USA takes the approach of regulating emissions intensity, ie how much pollution per unit of production. Table 2 shows these calculations for each NSW power station. The NSW power stations look terrible on this metric also. Vales Point for instance releases 5.7 times as much NO<sub>2</sub> per MWh of electricity produced as would be allowed by the American rule.

**Table 2: Emission intensities: 2016-17 NPI emissions divided by production figures from the Australian Energy Market Operator.**

	SO <sub>2</sub> Kg/MWh	NO <sub>2</sub> Kg/MWh	Mercury mg/MWh	PM <sub>2.5</sub> g/MWh
Bayswater	3.15	2.02	4.6	18
Liddell	3.52	1.96	4.4	19
Eraring	2.04	1.24	0.1	10
Vales Point	1.97	2.58	0.7	9
Mt Piper	4.23	2.91	3.8	8
US rule 2012	0.68	0.45	5.9	

## **Summary**

The power stations in NSW are much more highly polluting than equivalent plant in the countries we usually compare ourselves to. Pollution travels long distances. The greatest health damage is from the central coast power stations as there are large local populations, and common weather patterns carry pollution to the Sydney basin where most of the NSW population lives. It is unacceptable that this health burden is imposed on the people of NSW when there are well established technical solutions to the problem of generating electricity without damaging health.

All the NSW power stations will have to close over the next two decades for climate reasons, but any power station planning to operate for more than two years should be required to upgrade to modern pollution control technologies. The limits set out in Schedule 1 of the proposed amendment would require power station operators to make these upgrades.