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Protection of the Environment Operations Amendment (Clean Air) Bill 2021

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Protection of the Environment Operations Amendment (Clean Air) Bill 2021

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Terms of reference

That:

(a) the Protection of the Environment Operations Amendment (Clean Air) Bill 2021 be referred to Portfolio Committee No. 7 – Planning and Environment for inquiry and report

(b) the bill be referred to the committee at the conclusion of the mover's second reading speech

(c) the committee report by 18 November 2021.[1]

The terms of reference were referred to the committee by the Legislative Council on 11 May 2021.[2]

1 The original reporting date was 27 August 2021 (*Minutes*, NSW Legislative Council, 11 May 2021, pp 2148-9 (Natasha Maclaren-Jones)). The reporting date was later extended to 10 September 2021 (*Minutes*, NSW Legislative Council, 9 June 2021, p 2274 (Cate Faehrmann)). The reporting date was extended to 18 November 2021 (*Minutes*, NSW Legislative Council, 13 October 2021, p 2457 (Mark Pearson)).

2 *Minutes*, NSW Legislative Council, 11 May 2021, pp 2148-9.

Committee details

Committee members

The Hon Mark Pearson MLC*	Animal Justice Party	*Acting Chair*
Ms Abigail Boyd MLC**	The Greens	
The Hon Catherine Cusack MLC	Liberal Party	
The Hon Rose Jackson MLC***	Australian Labor Party	
The Hon Shayne Mallard MLC	Liberal Party	
The Hon Taylor Martin MLC******	Liberal Party	
The Hon Penny Sharpe MLC	Australian Labor Party	

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* The Hon Mark Pearson MLC replaced Ms Cate Faehrmann MLC as Chair from 1 June 2021 for the duration of the inquiry.

** Ms Abigail Boyd MLC substituted for Ms Cate Faehrmann MLC from 1 June 2021 for the duration of the inquiry.

*** The Hon Rose Jackson MLC replaced the Hon Mark Buttigieg MLC as a substantive member of the committee from 21 June 2021.

**** The Hon Taylor Martin MLC substituted for the Hon Ben Franklin MLC from 27 May 2021 for the duration of the inquiry.

Chair's foreword

Air pollution is a critical health issue. Research shows that even low levels of exposure to solid particles, nitrogen oxides, sulphur dioxide and mercury cause a myriad of acute and chronic illnesses and diseases as well as premature death. One of the largest contributors to these air pollutants in NSW is coal-fired energy generation, which is also the most significant controllable source of air pollution in NSW. The health impacts of this air pollution are felt not only by communities close to coal-fired power stations but are felt also in Sydney and across NSW.

Presently, there are prescribed limits on the concentrations of emissions of solid particles, nitrogen oxides, sulphur dioxide and mercury which coal-fired power stations in NSW must not exceed. There are different prescribed exceedance limits for the five operating coal-fired power stations which are set either by licence or regulation. Numerous overseas jurisdictions require much lower emissions from coal-fired power stations which are able to be met through the use of best available pollution control technology (BACT).

Comparatively, the exceedance limits for coal-fired power stations in NSW permit high concentrations of emissions of air pollutants. The Protection of the Environment Operations Amendment (Clean Air) Bill 2021 (bill) seeks to standardise and tighten these exceedance limits for all coal-fired power stations in NSW to more closely align regulation in NSW with best practice and international standards. Practically, coal-fired power stations in NSW would need to install, or in some cases make upgrades to, BACT in order to meet the stricter standards in the bill.

During the inquiry numerous stakeholders considered that the benefits of abating negative public health impacts and the resultant benefits for the economy outweighed the cost of installing BACT to be borne by industry. In contrast, industry stakeholders expressed concern about the prohibitive nature of the technology costs and the capacity of power stations to remain operationally and financially viable if required to install BACT.

The committee considers it is time that NSW's comparatively outdated and relaxed exceedance limits are tightened to reduce harmful impacts to NSW residents' health. Recognising the possibility of unintended consequences to reliability of electricity, the committee acknowledges that some transition measures and provisions may be necessary so as to plan for an orderly installation of BACT across coal-fired power stations in NSW.

Finally, I present the report to the House and call on members of the Legislative Council to consider the committee comments and stakeholders' views expressed in this report when bill is brought forward for debate in the House, particularly in relation to transition measures and provisions.

On behalf of the committee, I would like to thank all who participated in the inquiry. I would also like to thank committee members for their considered contributions and the secretariat for their assistance.

Mark Pearson MLC
Acting Committee Chair

Recommendation

That the Legislative Council proceed to debate the Protection of the Environment Operations Amendment (Clean Air) Bill 2021 and the committee comments and stakeholders' views expressed in this report be addressed during debate in the House, particularly in relation to transition measures and provisions.

Conduct of inquiry

The terms of reference for the inquiry were referred to the committee by the Legislative Council on 11 May 2021.

The committee received 33 submissions and one supplementary submission.

The committee held one public hearing via videoconference on 15 October 2021.

Inquiry related documents are available on the committee's website, including submissions, hearing transcript, tabled documents, correspondence and answers to questions on notice.

Chapter 1 Overview

This chapter provides an overview of the current regulation of air pollution from coal-fired power stations in New South Wales (NSW) and the proposed amendments to this regime in the Protection of the Environment Operations Amendment (Clean Air) Bill 2021 (bill). This chapter starts by briefly detailing the coal-fired power stations in NSW. It then outlines the air pollutants from coal-fired power stations addressed by the bill and gives a high-level overview of the adverse health impacts of exposure to these pollutants. It concludes with a brief summary of national and international air quality and pollution standards.

Air pollution from coal-fired power stations in NSW

1.1 Ambient air quality refers to the quality of outdoor air at any given moment. Point-source emissions refer to air pollution, or air impurities, emitted from a specific source, such as a coal-fired power station. The amount of point-source emissions impacts the quality of a geographical region's ambient air.[3]

1.2 There are five currently operating coal-fired power stations in NSW: Eraring in Lake Macquarie, Vales Point on the Central Coast, Mount Piper near Lithgow in the Central West, and Bayswater and Liddell in the Hunter Region. These stations are planned to close between 2023 and 2049. Eraring is operated by Origin Energy, Vales Point by Delta Electricity, Mount Piper by EnergyAustralia and Bayswater and Liddell by AGL.[4]

1.3 Burning coal for electricity generation emits various pollutants into the air, including solid particles, sulphur dioxide, nitrogen dioxide or nitric oxide (nitrogen oxides) and mercury.[5] Solid particles are a measurement of fine particulate matter (PM2.5) and coarse particulates (PM10). These particulates occur at all stages of the coalmining, handling, transport and generation process. These tiny particles include soot, fly-ash and heavy metals.[6]

1.4 Sulphur dioxide and nitrogen oxides are gases emitted during coal combustion.[7] Both these toxic gases also form secondary PM2.5 as they transform from a gaseous form (or a condensable particulate) into a solid particulate.[8]

1.5 In addition, although released in lower levels than solid particles, nitrogen oxides and sulphur dioxide, mercury is a potent neurotoxin emitted via coal burning that can remain in the ambient air for years.[9]

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3 Submission 19, Environmental Justice Australia, p 5.

4 *Hansard,* NSW Legislative Council, 5 May 2021, p 5 (Abigail Boyd); Submission 19, Environmental Justice Australia, p 3; Submission 30, Nature Conservation Council of NSW, p 3.

5 Submission 19, Environmental Justice Australia, p 10.

6 *Hansard,* NSW Legislative Council, 5 May 2021, p 6 (Abigail Boyd).

7 *Hansard,* NSW Legislative Council, 5 May 2021, p 6 (Abigail Boyd); Submission 19, Environmental Justice Australia, p 10; Submission 31, Clean Air Society of Australia and New Zealand, p 4.

8 Evidence, Mr Nick Witherow, Principal Lawyer, Environmental Justice Australia, 15 October 2021, p 12.

9 Submission 19, Environmental Justice Australia, pp 10-11.

1.6 It is widely understood that exposure to air pollution has adverse human health impacts. These are listed below and discussed further in chapter 2.

- Solid particles exposure has been linked to early death, heart disease, stroke, congestive heart failure, cancer, respiratory inflammation, asthma and chronic obstructive pulmonary disease as well as developmental and reproductive harms.
- Nitrogen oxides exposure can impact cardiovascular and respiratory systems, including causing and exacerbating asthma, chronic obstructive pulmonary disorder and other respiratory diseases.
- Sulphur dioxide exposure can lead to chronic obstructive pulmonary disorder, bronchitis, stroke, cardiovascular disease and lung cancer.
- Mercury, ingested through contaminated food or dirt, poses risks to cognitive and neurological development of children.[10]

Overview of regulation of air pollution from coal-fired power stations in NSW

1.7 Regulation of point-source emissions from coal-fired power stations involves the setting of maximum emission limits of concentration of a pollutant or, in other words, exceedance limits. The regulatory apparatus which prescribe these standards in NSW are:

- *Protection of the Environment Operations Act 1997* (Act)
- the Protection of the Environment Operations (Clean Air) Regulation 2021 (Clean Air Regulation)
- individual licences granted to coal-fired power stations.

1.8 Together the Act and the Clean Air Regulation require coal-fired power stations to comply with emissions standards of solid particles and nitrogen oxides.[11] Standards of concentration for emission of mercury and sulphur dioxide are not regulated by the Act and the Clean Air Regulation, but instead by Environment Protection Licences granted to each coal-fired power station.[12]

1.9 Environmental Protection Licences granted by the NSW Environment Protection Authority (EPA) can, and have, placed more stringent emissions limits for solid particles and nitrogen oxides than those set together by the Act and the Clean Air Regulation. This is demonstrated below in Table 1, which shows that the Environmental Protection Licence for solid particles for all power stations, and for nitrogen oxides for Eraring, Bayswater and Mount Piper, is at a more stringent standard than that set by the Act and the Clean Air Regulation.[13]

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10 Submission 7, Doctors for the Environment, p 1; *Hansard,* NSW Legislative Council, 5 May 2021, pp 6-7 (Abigail Boyd).

11 *Protection of the Environment Operations Act 1997*, s 128; Protection of the Environment Operations (Clean Air) Regulation 2021, sch 3. See also Submission 19, Environmental Justice Australia, p 5.

12 *Protection of the Environment Operations Act 1997*, ch 3; Submission 30, Nature Conservation Council of NSW, pp 3-4.

13 See, for example, Submission 19, Environmental Justice Australia, pp 7 and 10-11; Submission 30, Nature Conservation Council of NSW, p 4; Evidence, Ms Sarah Balmanno, Manager Strategic Policy

Table 1 Current exceedance limits for air pollutants from coal-fired power stations in NSW

	Group	Solid particles (mg/m^3)		Nitrogen dioxide/nitric oxide (mg/m^3)		Mercury ($\mu g/m^3$)	Sulphur dioxide (mg/m^3)
Instrument		Licence	Act/ Regulation	Licence	Act/ Regulation	Licence	Licence
Eraring	3	50	250	1100	2,500	50	1700
Bayswater				1500			
Mount Piper	4						
Vales Point	5		100		800		
Liddell							1900

Source: Protection of the Environment Operations (Clean Air) Regulation 2021, sch 3 (Electricity generation); Submission 19, Environmental Justice Australia, pp 6-7.

1.10 As seen in Table 1, there are different exceedance limits for the five coal-fired power stations in NSW. The Clean Air Regulation deems each coal-fired power station in NSW to belong to a 'Group' based on their age, with Group 1 being the oldest stations and Group 6 the newest.[14] The newer the coal-fired power station, the more stringent the emission exceedance limit in the Clean Air Regulation. However, the Clean Air Regulation allows for a coal-fired power station to be declared exempt from a prescribed standard.[15] For example, Eraring undertook major upgrades which set it in Group 6 under the Clean Air Regulation but was granted an exemption and, therefore, is deemed to still be a Group 3 power station.[16]

1.11 Vales Point and Liddell were Group 2 power stations but since 2012 have been deemed to belong to Group 5 by virtue of the 'phasing out' provisions in the Clean Air Regulation.[17] That is, as older power stations have older technology that generates higher emissions, provisions in the Clean Air Regulation seek to phase out the old technology by deeming older stations to belong to a newer group, therefore subjecting them to more stringent emission limits. Practically, the coal-fired power station is required to plan equipment upgrades and replacements in order to reduce emissions and therefore comply with the new emissions exceedance limit for its new 'Group'.[18]

1.12 However, coal-fired power stations can also be declared exempt from a prescribed standard set by the phasing out provisions.[19] For example, Group 2 power stations can be granted an exemption from being subjected to the Group 5 emissions limits.[20] An exemption is for five

and Programs, Climate Change and Sustainability Division, Energy, Environment and Science Group, Department of Planning, Industry and Environment, 15 October 2021, pp 44-45.

14 Protection of the Environment Operations (Clean Air) Regulation 2021, cl 33.

15 Protection of the Environment Operations (Clean Air) Regulation 2021, cl 34(3); Submission 30, Nature Conservation Council of NSW, p 4.

16 Submission 30, Nature Conservation Council of NSW, pp 3-4.

17 Protection of the Environment Operations (Clean Air) Regulation 2021, cl 36(1).

18 Submission 30, Nature Conservation Council of NSW, pp 5-6.

19 Submission 30, Nature Conservation Council of NSW, p 5.

20 Protection of the Environment Operations (Clean Air) Regulation 2021, cl 36(2).

years and can be extended on application by the licensee.[21] As can be seen in Table 1, Liddell and Vales Point have an exemption from a Group 5 grading for the emission of nitrogen oxides. Vales Point has been exempt for 10 years (two five-year licences) and applied for a third exemption in December 2020.[22]

Review of the Clean Air Regulation

1.13 The NSW EPA is required to review the Clean Air Regulation every five years. However, it recently announced that it was not able to meet the deadline of 1 September 2021 to review the Clean Air Regulation and has committed to having a review completed by 1 September 2022. Therefore, as an interim measure, the EPA remade the Clean Air Regulation, with the 2021 version replicating and replacing its previous 2010 iteration with only some administrative changes. The 2021 regulation will be repealed on 1 September 2022, prior to which the review would be finalised and an updated regulation in place.[23]

NSW Clean Air Strategy

1.14 A draft of the *NSW Clean Air Strategy 2021-30* was released by the NSW Government for consultation in March 2021. The strategy notes that NSW is transitioning to cleaner energy and technology, with an increasing number of decentralised generators like wind and solar farms, and retiring coal-fired electricity generators.[24]

Overview of the bill's purpose and provisions

1.15 As stated by Ms Boyd in her second reading speech, the objective of the bill is improved public health through the reduction of permissible emissions levels from coal-fired power stations.[25]

1.16 The bill seeks to amend section 128 of the Act by inserting a new clause to standardise the concentration for emissions of a range of air pollutants emitted by coal-fired power stations in NSW. The bill tightens exceedance limits for the emission of nitrogen oxides, sulphur dioxide, solid particles and mercury, as outlined in Table 2. The bill proposes to move the regulation of these air pollutants from the Clean Air Regulation into the Act itself.

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21 Protection of the Environment Operations (Clean Air) Regulation 2021, cl 36(3)(b) and cl 36(4); Submission 30, Nature Conservation Council of NSW, p 5.

22 Submission 19, Environmental Justice Australia, pp 6 and 8.

23 NSW Environment Protection Authority, *Remake of the Protection of the Environment Operations General and Clean Air Regulations 2021* (2 September 2021), NSW Environment Protection Authority, https://www.epa.nsw.gov.au/licensing-and-regulation/legislation-and-compliance/about-the-poeo-act/remake-of-poeo-regulations-2021. See also Evidence, Dr Brad Smith, Campaigns Director, Nature Conservation Council of NSW, 15 October 2021, p 19.

24 Department of Planning, Industry and Environment, *NSW Clean Air Strategy 2021–30: Draft for Consultation* (Report, March 2021), p 5, https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Air/nsw-clean-air-strategy-2021-30-draft-for-consultation-210080.pdf.

25 *Hansard,* NSW Legislative Council, 5 May 2021 pp 4-5 (Abigail Boyd).

Table 2 Comparison of existing and proposed exceedance limits in the bill for air pollutants emitted by coal-fired power stations in NSW

	Group	Solid particles (mg/m^3)		Nitrogen dioxide/nitric oxide (mg/m^3)		Mercury ($\mu g/m^3$)	Sulphur dioxide (mg/m^3)
Instrument		Licence	Act/ Regulation	Licence	Act/ Regulation	Licence	Licence
Eraring	3	50	250	1100	2,500	50	1700
Bayswater				1500			
Mount Piper	4						
Vales Point	5		100		800		
Liddell							1900
Standard proposed in bill		**20**		**200**		**1.5**	**200**

Source: Protection of the Environment Operations (Clean Air) Bill 2021, cl 1; Protection of the Environment Operations (Clean Air) Regulation 2021, sch 3 (Electricity generation); Submission 19, Environmental Justice Australia, pp 6-7.

1.17 In her second reading speech, Ms Boyd highlighted that under the current regulatory framework, there are inconsistent standards for the five coal-fired power stations in NSW. This is the result of station-specific licences setting the level of allowable emissions of certain air pollutants when there is no level set by the Clean Air Regulation. Ms Boyd stated that the bill will address these anomalies between the coal-fired power stations in NSW by requiring all of them to remain within consistent emissions controls. Further, the bill expands the current scope of the Act and Clean Air Regulation by including exceedance limits for mercury and sulphur dioxide.[26]

1.18 Ms Boyd stated that stricter exceedance limits on pollution emitted from coal-fired power stations would effectively mandate the installation of emission control technology at those power stations.[27] There are various forms of technology which can be installed to enable a reduction in the levels of emissions from coal-fired power stations.[28] Essentially, in order to meet the lower exceedance limits proposed by the bill, coal-fired power stations in NSW would need to install new pollution control technology or combinations of technology.[29]

Overview of national and international air pollution standards

National air pollution standards

1.19 The National Environment Protection (Ambient Air) Measure (Ambient Air Quality NEPM) sets national standards for six air pollutants: carbon monoxide, ozone, sulphur dioxide, nitrogen dioxide, lead and solid particles. In April 2021, the National Environment Protection Council varied the standards for ozone, nitrogen oxide and sulphur dioxide which were legislated in May

26 *Hansard,* NSW Legislative Council, 5 May 2021 p 6 (Abigail Boyd).

27 *Hansard,* NSW Legislative Council, 5 May 2021 p 4 (Abigail Boyd).

28 Submission 19, Environmental Justice Australia, p 16.

29 *Hansard,* NSW Legislative Council, 5 May 2021, p 4 (Abigail Boyd).

2021. Table 3 sets out the current national exceedance limits for maximum concentration of the air pollutants in the bill, as well as the standard for sulphur dioxide and goal for PM2.5 from 2025.[30]

Table 3 Exceedance limits under the National Environment Protection (Ambient Air) Measure

Air pollutant	Averaging period	Exceedance limit	Standard from/goal for 2025
Solid particles (PM10)	24-hours Annual	50 μg/m^3 25 μg/m^3	N/A
Solid particles (PM2.5)	24-hours Annual	25 μg/m^3 8 μg/m^3	20 μg/m^3 7 μg/m^3
Nitrogen dioxide	One hour Annual	8 pphm 1.5 pphm	N/A
Sulphur dioxide	One hour Annual	10 pphm 2 pphm	7.5 pphm

Source: National Environment Protection (Ambient Air Quality) Measure (Cth).

1.20 With the above April 2021 changes, the National Environment Protection Council noted that the concentration standard for:

- nitrogen dioxide is now tighter than the World Health Organisation (WHO) *Global Air Quality Guidelines*, reflecting the most recent health evidence about the impacts of nitrogen dioxide
- sulphur dioxide is now one of the tightest in the world.[31]

1.21 This Council also noted that the intent of Ambient Air Quality NEPM is a reference standard and does not intrude on states and territories' regulatory powers:

> The Explanatory Statement clarifies this intent of the NEPM as a standard for reporting representative ambient air quality within an airshed, and not as a regulatory standard. The AAQ NEPM does not constrain a jurisdiction's ability to manage local or regional air quality issues.[32]

30 NSW Environment Protection Authority, *Standards and Goals for Measuring Air Pollution* (20 August 2021), Department of Planning, Industry and Environment, https://www.environment.nsw.gov.au/topics/air/understanding-air-quality-data/standards-and-goals.

31 National Environment Protection Council, *Key Changes to the Ambient Air Quality Measure agreed by Ministers April 2021* (15 April 2021), National Environment Protection Council, http://www.nepc.gov.au/system/files/pages/d2a74405-16f6-4b06-baf1-7c2fc1c1e12f/files/key-changes-aaq-measure-agreed-ministers-april-2021.pdf.

32 National Environment Protection Council, *Key Changes to the Ambient Air Quality Measure agreed by Ministers April 2021* (15 April 2021), National Environment Protection Council.

World Health Organisation Global Air Quality Guidelines

1.22 In September 2021, the thresholds set in 2005 in the *WHO Global Air Quality Guidelines* (WHO Guidelines) for solid particles, ozone, nitrogen dioxide and sulphur dioxide were updated based on expert evaluation of current scientific evidence. The WHO Guidelines apply worldwide to outdoor and indoor environments. The thresholds for solid particles, nitrogen dioxide and sulphur dioxide are set out in Table 4.[33]

Table 4 Exceedance limits under the WHO Global Air Quality Guidelines

Air pollutant	Averaging time	Exceedance limit
Solid particles (PM10)	24-hours Annual	45 μg/m^3 15 μg/m^3
Solid particles (PM2.5)	24-hours Annual	15 μg/m^3 5 μg/m^3
Nitrogen dioxide	24-hours Annual	25 μg/m^3 10 μg/m^3
Sulphur dioxide	24-hours	40 μg/m^3

Source: World Health Organisation, WHO Global Air Quality Guidelines: Particulate Matter (PM2.5 and PM10), Ozone, Nitrogen Dioxide, Sulphur Dioxide and Carbon Monoxide (2021).

Referral of the bill

1.23 The bill was introduced into the Legislative Council on 5 May 2021 by Ms Abigail Boyd MLC.[34] On 11 May 2021, the Legislative Council on the recommendation of the Selection of Bills Committee referred the provisions of the bill to this committee for inquiry and report by 27 August 2021.[35]

1.24 On 9 June 2021, the Legislative Council resolved to extend the reporting date for the inquiry into the bill to 10 September 2021.[36] The reporting dated was later extended to 18 November 2021.[37]

33 World Health Organisation, *WHO Global Air Quality Guidelines. Particulate Matter (PM2.5 and PM10), Ozone, Nitrogen Dioxide, Sulphur Dioxide and Carbon Monoxide* (2021), Institutional Repository for Information Sharing, https://apps.who.int/iris/handle/10665/345329.

34 *Minutes*, NSW Legislative Council, 5 May 2021, p 2105 (Abigail Boyd).

35 *Minutes*, NSW Legislative Council, 11 May 2021, pp 2148-9 (Natasha Maclaren-Jones).

36 *Minutes*, NSW Legislative Council, 9 June 2021, p 2274 (Cate Faehrmann).

37 *Minutes*, NSW Legislative Council, 13 October 2021, p 2457 (Mark Pearson).

Chapter 2 Key Issues

This chapter considers a number of key issues in relation to the Protection of the Environment Operations Amendment (Clean Air) Bill 2021 (bill) as identified by inquiry participants. First, the bill's rationale is discussed, including air quality in NSW, the levels of air pollution attributable to emissions from coal-fired power stations and the associated health impacts and related costs. It then considers current exceedance limits for the concentration of air pollutants from coal-fired power stations and pollution control technology in NSW and internationally. Following this, the chapter focuses on the purported impacts of the bill, specifically in achieving the objective of improving air quality and abating public health issues caused by air pollution, as well as the impacts on industry and reliability of electricity. Finally, suggested amendments to the bill proposed by stakeholders are outlined. The chapter concludes with the committee's comments and recommendation in relation to the bill.

Impact of coal-fired power stations on air quality in NSW

2.1 This first section summarises the evidence on air quality and air quality monitoring in NSW and the extent to which coal-fired power stations contribute to overall air pollution in NSW.

Air quality in NSW

2.2 During the inquiry stakeholders noted that whilst in NSW the community generally enjoys good air quality, there is no safe level of air pollution.[38] Dr Richard Broome, Acting Executive Director of Health Protection at NSW Health, stated that while air quality in NSW is generally very good by international standards, 1 to 2 per cent of the burden of disease is caused by air pollution.[39]

2.3 At the hearing Dr Broome advised the World Health Organisation (WHO) updated its *Global Air Quality Guidelines* (WHO Guidelines), tightening the thresholds for air pollutants based on expert evaluation of current scientific evidence. He observed these guidelines help interpret the science on air pollution in NSW which is that even at low levels of air pollution, there are health impacts.[40]

2.4 In that regard, evidence was presented at the hearing that air quality monitoring in NSW has demonstrated breaches of the WHO Guidelines and, specifically, that none of the monitoring sites in NSW have met the new WHO Guidelines with respect to fine solid particle pollution (PM2.5) and most sites did not meet coarse particle pollution (PM10) or nitrogen oxides limits.[41]

38 See, for example, Submission 10, Centre for Air pollution, energy and health Research, pp 1-2; Submission 11, Professor Peter Sainsbury, p 1; Submission 19, Environmental Justice Australia, p 11; Submission 20, Mr Bruce Buckheit, p 5; Submission 25, Kim Grierson, p 1; Submission 30, Nature Conservation Council of NSW, pp 1 and 7; Evidence, Mr Witherow, 15 October 2021, p 10; Evidence, Dr Smith, 15 October 2021, p 12; Evidence, Dr Christine Cowie, Affiliate, Centre for Air Pollution, Energy and Health Research, 15 October 2021, pp 20-21.

39 Evidence, Dr Richard Broome, Acting Executive Director, Health Protection NSW, NSW Health, 15 October 2021, p 37.

40 Evidence, Dr Broome, 15 October 2021, p 37. See also Evidence, Dr Smith, 15 October 2021, p 12.

41 See, for example, Evidence, Mr Jonathan Moylan, NSW Clean Air Campaigner, Healthy Futures, 15 October 2021, p 4; Evidence, Dr Smith, 15 October 2021, p 11.

2.5 Two coal-fired energy generators participated in this inquiry – Delta Electricity and Origin Energy. Speaking generally about air quality in Australia, Mr Justin Flood, Executive Manager Sustainability at Delta Electricity, referenced the Organisation for Economic Co-operation and Development's (OECD) finding that 95 per cent of the Australian population lives with air quality that is better than the WHO Guidelines threshold for solid particles. By way of comparison, Mr Flood noted only 40 per cent of the United States (US) population live with air quality above that same threshold.[42]

2.6 With respect to air quality around coal-fired power stations in NSW, Mr Flood asserted that according to data published by the Department of Planning, Industry and Environment and the NSW Environment Protection Authority (EPA), air quality in NSW is generally good or very good. Mr Flood highlighted that according to data, the Central Coast has the best air quality in the Greater Metropolitan Region (Sydney, Newcastle and Wollongong regions) (GMR) and there is no air quality issue which requires stricter regulation.[43]

2.7 Similarly, Mr Greg Jarvis, Executive General Manager of Energy Supply and Operation at Origin Energy, noted the air quality monitoring near Eraring power station indicates no problem with local air quality other than when caused by bushfires.[44]

2.8 Different views were expressed about the adequacy and effectiveness of air quality monitoring in NSW. Both Mr Flood and Mr Jarvis noted that long term air quality monitoring on the Central Coast is managed by industry and separately by NSW EPA and reliably shows that there is no issue with local air quality.[45] In response to these views, Mr Will Belford, Spokesperson for Future Sooner – an organisation representing residents in the Central Coast and Lake Macquarie region concerned about coal-fired power station pollution – contended that the results from those three air quality monitors on the Central Coast depend on many climatic factors like wind which determine the air that the devices actually monitor.[46]

2.9 Other inquiry participants considered that the ambient air monitoring system network in NSW is inadequate and ought to be improved.[47] For example, Mr Belford referenced a report by NSW Health which found an urgent need to introduce appropriate air quality monitoring in the Hunter region in order to more accurately assess the cumulative impact on the community of pollution from coal-fired power stations.[48]

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42 Evidence, Mr Justin Flood, Executive Manager, Sustainability, Delta Electricity, 15 October 2021, p 29.

43 Evidence, Mr Flood, 15 October 2021, p 29; Correspondence from Mr Greg Everett, Chief Executive, Delta Electricity to committee, 21 October 2021, p 1.

44 Evidence, Mr Greg Jarvis, Executive General Manager, Energy Supply and Operation, Origin Energy, 15 October 2021, p 28.

45 Evidence, Mr Jarvis, 15 October 2021, p 28; Evidence, Mr Flood, 15 October 2021, p 30.

46 Evidence, Mr Will Belford, Spokesperson, Future Sooner, 15 October 2021, p 4.

47 See, for example, Submission 9, Mr Christopher James, p 3; Submission 19, Environmental Justice Australia, Attachment, p 6; Submission 20, Mr Bruce Buckheit, p 5; Submission 25, Kim Grierson, p 2.

48 Answers to questions on notice, Mr Will Belford, Spokesperson, Future Sooner, 15 October 2021, citing NSW Health, *Respiratory and Cardiovascular Diseases and Cancer Among Residents in the Hunter New England Area Health Service* (2010) https://www.health.nsw.gov.au/environment/Publications/HNE-respi-cardio-disease.pdf.

Contribution of coal-fired power station emissions to air pollution in NSW

2.10 Community and environmental organisations and medical research stakeholders emphasised that emission of pollutants from coal-fired power stations are a significant pollution source leading to poor air quality.[49] Moreover, it was noted that coal-fired power stations are the most significant controllable source of air pollution in NSW.[50]

2.11 These inquiry participants noted that where coal-fired power stations exist, they are typically the main source of air pollution in that area. However, the impacts on air pollution are much wider, given that most of the sulphur dioxide, nitrogen oxides and particle pollutants in Sydney's air are from the coal-fired power stations in the Hunter and Central Coast regions.[51]

2.12 With respect to PM2.5 in NSW, stakeholders referred to studies by NSW government bodies indicating the high contribution of coal-fired power stations to the levels of PM2.5 in NSW.

- A report published by NSW EPA in 2019 found that coal mining is the primary contributor of human-made sources of PM2.5.[52]
- A study funded by NSW EPA and NSW Health, conducted by Dr Broome in 2020 (Broome study), found that wood heaters, on-road motor vehicles and coal-fired power stations are the most significant sources air pollution, with the latter emitting 10.5 per cent of urban PM2.5 pollution.[53]
- A study by the NSW Office of the Environment and Heritage found that coal-fired power stations cause 17 per cent of human-made PM2.5 in the GMR, which is as much pollution for every Sydney district as motor vehicles, and more pollution than motor vehicles in winter.[54]

49 See, for example, Submission 7, Doctors for the Environment Australia, pp 1-2; Submission 10, Centre for Air pollution, energy and health Research, p 3; Submission 19; Environmental Justice Australia, p 3.

50 See, for example, Submission 19; Environmental Justice Australia, p 3; Submission 27, Community Environment Network, p 1; Submission 30, Nature Conservation Council of NSW, p 1.

51 See, for example, Submission 19, Environmental Justice Australia, p 14; Submission 30, Nature Conservation Council of NSW, p 6.

52 Submission 10, Centre for Air pollution, energy and health Research, p 2; Submission 19, Environmental Justice Australia, p 3, citing NSW Environment Protection Authority, *Air Emissions Inventory for the Greater Metropolitan Region in New South Wales, 2013 Calendar Year, Consolidated Natural and Human-Made Emissions: Results* (2019), https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/air/19p1917-air-emissions-inventory-2013.pdf?la=en&hash=9217ADF2C8D5647147FF00F447258319D00BB75D.

53 Submission 24, Healthy Futures, p 1, citing Richard Broome et al, 'The Mortality Effects of PM2.5 Sources in the Greater Metropolitan Region of Sydney' (2020) 137 *Environment International*; Evidence, Dr Broome, 15 October 2021, p 37.

54 Submission 24, Healthy Futures, p 2, citing Lisa T C Chang et al, 'Major Source Contributions to Ambient PM2.5 and Exposures within the New South Wales Greater Metropolitan Region' (2019) 10(3) *Atmosphere*, p 138. See also Evidence, Dr Smith, 15 October 2021, p 12.

2.13 In giving evidence Dr Broome informed that his 2020 study found that there was a relatively even spread of particulate pollution from coal-fired power stations across the GMR which did not peak at any particular location but was rather dispersed across the region.[55]

2.14 With respect to other air pollutants, Mr Nick Witherow, Principal Lawyer at Environmental Justice Australia (EJA), stated that coal-fired power stations in NSW contribute 45 per cent of all nitrogen oxides, 84.9 per cent of sulphur dioxide in the GMR and coal-fired power stations contribute four times more mercury than motor vehicles.[56] Similarly, Dr Ben Ewald, Convenor of the Air Pollution Special Interest Group at Doctors for the Environment Australia, was primarily concerned about the high level of nitrogen dioxide and sulphur dioxide emissions in NSW because those gases form secondary solid particles.[57]

2.15 Mr Flood held a different view, proposing that the impact of air pollutants from coal-fired power stations on air quality is much less than asserted by other stakeholders. He identified that the Department of Planning, Industry and Environment's 2020 Air Quality Study for the GMR reported 82.5 per cent of nitrogen oxides emissions were attributable to motor vehicles and the highest contributors to solid particles were wood fire heaters, industry (not coal-fired power stations) and motor vehicles.[58] Further, with respect to Vales Point power station on the Central Coast, Delta Electricity asserted that the station's current air modelling demonstrates that it has a minimal contribution to measured levels of pollution in the area, which are within the ambient air quality guidelines.[59]

2.16 Regarding the emission of pollutants from Origin Energy's Eraring power station, Mr Jarvis noted that nitrogen oxides, sulphur dioxide, solid particles and mercury emissions are well below their licence exceedance limits and their impact on ambient air quality complies with existing air quality standards.[60]

Adverse health impacts of air pollution from coal-fired power stations

2.17 This section summarises stakeholder's evidence about disease, illnesses and deaths associated with air pollution and specifically from those pollutants emitted by coal-fired power stations in NSW which are proposed to be regulated by the bill. The reported health impacts on local communities near coal-fired power stations, as well as in Sydney and NSW more broadly, are then considered. Some individual experiences of poor health outcomes from inquiry participants who reside in the Hunter and Central Coast regions are also highlighted. Finally, the economic cost of health-related impacts of air pollution is examined.

55 Evidence, Dr Broome, 15 October 2021, p 39.

56 Evidence, Mr Nick Witherow, Principal Lawyer, Environmental Justice Australia, 15 October 2021, p 10.

57 Evidence, Dr Ben Ewald, Convenor, Air Pollution Special Interest Group, Doctors for the Environment Australia, 15 October 2021, p 23.

58 Evidence, Mr Flood, 15 October 2021, p 29.

59 Correspondence from Mr Everett to committee, 21 October 2021, p 2.

60 Evidence, Mr Jarvis, Origin Energy, 15 October 2021, p 28.

Health impacts from air pollution

2.18 As noted above, stakeholders cautioned that there is no safe level of air pollution exposure in terms of health impacts.[61] In giving evidence Mr Witherow observed that air quality and pollution standards indicate a reference level rather than a safe level of emissions.[62]

2.19 Many stakeholders indicated that over the past decade or so, a body of scientific research has developed, domestically and internationally, understanding the epidemiology of health effects of air pollutants and the health issues attributable to pollutants from coal-fired power stations.[63] EJA and the Nature Conservation Council of NSW (NCC) noted the International Agency for Research on Cancer identified air pollution as a human carcinogen and the WHO declared air pollution a public health emergency.[64]

2.20 EJA identified that PM2.5 is the most dangerous form of air pollution.[65] Numerous submissions noted the substantial body of evidence demonstrating that the primary health impacts of PM2.5 are mortality, heart disease, cardiovascular disease, respiratory disease, metabolic disease and neurological disease, stroke, lung cancer, diabetes and poor fetal growth during pregnancy.[66]

2.21 Stakeholders noted different studies attributing health impacts to exposure to solid particles pollution.

- A study from Queensland in 2020 found that for each 1μg/m^3 increase in annual PM2.5, there was an associated two percent increase in mortality, even when the PM2.5 levels were below the current standards.[67]

61 See, for example, Submission 10, Centre for Air pollution, energy and health Research, pp 1-2; Submission 11, Professor Peter Sainsbury, p 1; Submission 19, Environmental Justice Australia, p 11; Submission 20, Mr Bruce Buckheit, p 5; Submission 25, Kim Grierson, p 1; Submission 30, Nature Conservation Council of NSW, pp 1 and 7.

62 Evidence, Mr Witherow, 15 October 2021, p 10.

63 See, for example, Submission 7, Doctors for the Environment Australia, p 1; Submission 9, Mr Christopher James, p 1; Submission 10, Centre for Air pollution, energy and health Research, p 2; Submission 19, Environmental Justice Australia, pp 11-14; Submission 20, Mr Bruce Buckheit, p 5; Submission 21, Environmental Defenders Office, p 1; Submission 24, Healthy Futures, p 3; Submission 27, Community Environmental Network (Central Coast), p 1; Submission 30, Nature Conservation Council of NSW, pp 6-7; Evidence, Dr Broome, 15 October 2021, p 43; Evidence, Dr Ewald, 15 October 2021, p 20; Evidence, Dr Smith, 15 October 2021, p 12.

64 Submission 19, Environmental Justice Australia, p 11; Submission 30, Nature Conservation Council of NSW, p 6. See also Submission 24, Healthy Futures, p 2.

65 Submission 19, Environmental Justice Australia, p 11.

66 See, for example, Submission 7, Doctors for the Environment Australia, p 1; Submission 10, Centre for Air pollution, energy and health Research, p 2; Submission 19, Environmental Justice Australia, p 11.

67 Submission 19, Environmental Justice Australia, p 12, citing Wenhua Yu et al, 'The Association between Long-Term Exposure to Low-Level PM2.5 and Mortality in the State of Queensland, Australia: A Modelling Study with the Difference-in-Differences Approach' (2020) 17(6) *PLoS Medicine*, pp 1-17.

- A study from the University of Sydney found that for each 10μg/m^3 increase in PM2.5, there was an associated four per cent increase in out-of-hospital cardiac arrest.[68]

2.22 The principal health impacts of exposure to sulphur dioxide and nitrogen oxides, even at levels below current standards, include the development or exacerbation of respiratory disease, notably asthma, which can cause lifelong health impacts and premature death.[69] Dr Ewald posited that with respect to child asthma, research shows exposure to nitrogen dioxide causes asthma as a diagnosis as well as asthma attacks, therefore having both an acute and chronic effect.[70] Exposure to these irritant gases are also associated with adverse neonatal outcomes, such as preterm birth, low weight at birth and fetal growth restrictions. Chronic exposure to even low levels of sulphur dioxide has been associated with cardiorespiratory mortality.[71]

2.23 There are also serious health impacts from exposure to mercury. EJA noted that the WHO considers mercury one of the top ten chemicals of major health concern.[72] Inhalation of lower quantities through chronic exposure can cause tremors, emotional changes, insomnia, neuromuscular changes, headaches and cognitive difficulties.[73] EJA explained that methylmercury, which is not emitted into the air but rather forms when mercury is deposited in waterways, is also very dangerous. Children exposed to methylmercury in utero can develop IQ and motor function deficits and exposed adults can experience cardiovascular damage, endocrine disruption, diabetes risk, compromised immune function and death.[74]

2.24 By contrast, Mr Greg Everett, Chief Executive at Delta Electricity, argued that there is no evidence to support the bill and noted that according to the OECD, Australia has the second lowest mortality rate after New Zealand from air pollution out of 40 nations.[75]

Evidence of health impacts from coal-fired power station pollution

2.25 Some considered the Broome study to be seminal peer-reviewed research for the health impact and human cost of air pollution in NSW.[76] The Broome study estimated that air pollution from coal-fired power stations annually contributed to 45 premature deaths, equating to 620 years of life lost per year and translating to five days of loss of life expectancy on average.[77]

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68 Submission 19, Environmental Justice Australia, p 12; Submission 24, Healthy Futures, p 2, citing Bing Zhao et al, 'Short-Term Exposure to Ambien Fine Particulate Matter and Out-of-Hospital Cardiac Arrest: A Nationwide Case-Crossover Study in Japan' (2020) 4(1) *Lancet Planet Health*, p 15.

69 Submission 7, Doctors for the Environment Australia, p 1; Submission 10, Centre for Air pollution, energy and health Research, p 2; Submission 19, Environmental Justice Australia, pp 12-13.

70 Evidence, Dr Ewald, 15 October 2021, p 26. See also Evidence, Dr Cowie, 15 October 2021, p 26.

71 See, for example, Submission 19, Environmental Justice Australia, pp 12-13; Submission 30, Nature Conservation Council of NSW, p 6.

72 Submission 19, Environmental Justice Australia, p 11.

73 Submission 19, Environmental Justice Australia, p 13.

74 Submission 19, Environmental Justice Australia, p 13.

75 Evidence, Mr Greg Everett, Chief Executive, Delta Electricity, 15 October 2021, p 35.

76 See, for example, Evidence, Mr Moylan, 15 October 2021, p 8; Submission 19, Environmental Justice Australia, pp 13-14.

77 Richard Broome et al, 'The Mortality Effects of PM2.5 Sources in the Greater Metropolitan Region of Sydney' (2020) 137 *Environment International*. See also Evidence, Dr Broome, 15 October 2021, p 37; Evidence, Dr Cowie, 15 October 2021, p 21.

2.26 It was apparent in the evidence to the inquiry that the health impacts of pollution from coal-fired power stations differ across research.

- A 2020 study found that pollution from coal-fired power stations in NSW cause 450 low-weight births, 7,582 childhood asthma days and 477 premature deaths every year in NSW (Farrow study).[78]
- A study by epidemiologist Dr Ben Ewald (Ewald study) found that 279 deaths, 233 low-weight births and 369 cases of incident diabetes annually in the Sydney, Hunter Valley and Wollongong region are attributable to secondary solid particle pollution from coal-fired power stations.[79]

Research by Dr Broome and Dr Ewald

2.27 There was some discussion during the inquiry about the mortality figures reported in the Ewald study and Broome study on the health impacts of pollution from coal-fired power stations. In giving evidence Dr Ewald explained both studies are based on application of the health impact assessment method, meaning evidence from international literature is applied to the observed local air quality exposure, rather than counting the actual number of cases of disease in NSW.[80]

2.28 At the hearing, Dr Ewald also described the reasons his research estimated a higher number of deaths attributable to air pollution from coal-fired power stations than the estimate in the Broome study:

> When I estimated the mortality burden from power stations in New South Wales, I got a much larger number than Richard Broome did—I got about 280 deaths per year. That was based on particle characterisation work done by David Cohen from Australian Nuclear Science and Technology Organisation [ANSTO]. There are different ways of estimating this. The health impact assessment part of it—from how much air pollution to how many deaths—that is a fairly standard method, and I think we would agree on that. The difference is in the model exposure to the air—how much air pollution people are exposed to.[81]

2.29 In that regard, Dr Broome stated that in order to estimate the source specific PM2.5 concentration in the GMR, his study used a 'state-of-the-art atmospheric modelling framework developed by Martin Cope at the CSIRO.'[82] In considering the findings in the Ewald study, Dr Broome stated the difference in estimations between the two studies comes down to the location of the monitors. Dr Broome considered that the Ewald study may be more likely to overestimate the quantity of PM2.5 from coal-fired power stations because of the location of the monitors collecting the data used in the Ewald study.[83]

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78 Aidan Farrow, Andreas Anhäuser and Lauri Myllyvirta, *Lethal Power: How Burning Coal is Killing People in Australia* (Report, August 2020), pp 22 and 24. See, for example, Submission 19, Environmental Justice Australia, p 13; Submission 24, Healthy Future, p 2.

79 Dr Ben Ewald, *The Health Burden of Fine Particle Air Pollution from Electricity Generation in NSW* (Report, Environmental Justice Australia, November 2018). See also Submission 30, Nature Conservation Council of NSW, p 7.

80 Evidence, Dr Ewald, 15 October 2021, p 21. See also Evidence, Dr Broome, 15 October 2021, p 42.

81 Evidence, Dr Ewald, 15 October 2021, p 22.

82 Evidence, Dr Broome, 15 October 2021, p 37.

83 Evidence, Dr Broome, 15 October 2021, p 42.

Critique of research by Dr Ewald

2.30 Delta Electricity was of the view that there is no hard evidence to support the bill.[84] Delta Electricity and the Australian Energy Council (AEC) were of the view that Dr Ewald's research has been professionally discredited.[85] Both referred to, and expressed support for, a report by Environmental Risk Sciences Pty Ltd (EnRiskS), commissioned by the AEC, which reviewed Dr Ewald's research and reported:

- the research did not use standard scientific practices, such as discussion of uncertainties and consideration of other key health endpoints
- the approach in the research was 'flawed and misleading, not based on good science and will have resulted in a significant overestimation.'[86]

2.31 However, the EnRiskS report was also subject to critique. At the hearing Mr Jonathan Moylan, NSW Clean Air Campaigner at Healthy Futures, refuted the merit of the EnRiskS report, informing that some academics have expressed a critical view of the EnRiskS report.[87] Similarly, Dr Ewald argued that the EnRiskS report does not constitute a peer-review because it was commissioned by industry seeking to prevent reform. Moreover, he contended that the EnRiskS report confirmed the calculations in the Ewald study but then substituted lower values for coal-fired power station contributions to PM2.5 which was derived from old modelling, indicating that power stations caused 98 deaths per year.[88]

2.32 In conclusion, Dr Ewald contended while that the reported extent of health impacts varies across research, there is no evidence suggesting that there is no health impact:

> There is a substantial health burden for people on the Central Coast from nitrogen dioxide and for people across the Greater Metropolitan Region from fine particle pollution due to burning coal for electricity. Various estimates of the scale of these health burdens have arrived at different numbers, but nothing that has been put forward to the committee undermines the fact that there is a health case to answer for continuing to pollute at current levels and that it is the duty of governments to protect their citizens through the precautionary principle.[89]

Disproportionate health impacts on communities close to coal-fired power stations

2.33 One issue that was strongly expressed by some stakeholders was that communities near coal-fired power stations are exposed to the highest concentrations of air pollution and therefore are

84 Evidence, Mr Everett, 15 October 2021, p 35.

85 Evidence, Mr Flood, 15 October 2021, p 29; Correspondence from Mr Rhys Thomas, Policy Advisor, Australian Energy Council to committee, 18 October 2021, pp 1-2.

86 Correspondence from Mr Everett to committee, 21 October 2021, p 1; Correspondence from Mr Thomas to committee, 18 October 2021, pp 1-2.

87 Evidence, Mr Moylan, 15 October 2021, p 7.

88 Correspondence from Dr Ben Ewald, Convenor, Air Pollution Special Interest Group, Doctors for the Environment Australia to committee, 28 October 2021, p 3.

89 Correspondence from Dr Ewald to committee, 28 October 2021, p 4.

more burdened by poor health impacts.[90] Several residents and organisations from the Central Coast and the Hunter regions participated in the inquiry and described the health impact on their communities.

2.34 With respect to impacts on children, EJA informed that children are particularly vulnerable to the impacts of PM2.5 exposure as it affects lung development, often presenting as asthma.[91] Dr Ewald's research found that Lake Macquarie was the NSW local government area (LGA) with the highest levels of nitrogen dioxide from coal-fired power stations. It also found that this exposure was the cause of asthma for 6 per cent of childhood asthma, approximating to 650 children in Central Coast and Lake Macquarie area whose asthma was directly attributable to nitrogen dioxide emissions from coal-fired power stations.[92] This conclusion was referenced in submissions and evidence to the inquiry.[93]

2.35 In relation to the impact on mortality, in giving evidence Mr Moylan asserted that the NSW LGAs with the highest mortality due to air pollution from coal-fired power stations are the Central Coast, Lake Macquarie, Blacktown, Newcastle, Hornsby, the Hills, Sydney, Sutherland, Warringah, Parramatta and Penrith.[94]

2.36 A further issue was the climatic and population density factors impacting the extent of the health burden. Doctors for the Environment Australia argued that the health impacts from the two Lake Macquarie coal-fired power stations (Eraring and Vales Point) are greater than the other three coal-fired power stations in NSW because of the large and closely located communities and the weather patterns that carry the pollution to Sydney.[95]

2.37 A number of individuals who live close to these coal-fired power stations made submissions to the inquiry highlighting adverse health outcomes experienced by the submitters, their family or community.

- Future Sooner provided anecdotal evidence from mothers in the Central Coast and Lake Macquarie area that asthma had not been present in their family until they moved to the area.[96]
- The father of a family who lives seven kilometers from Eraring power station stated that tissue analysis of himself, his wife and his son showed high concentrations of heavy metals which are similar to the heavy metals detected in the PM2.5 residue which deposits on their home and property. Further, his son suffers from chronic asthmatic and bronchial issues.[97]

90 See, for example, Submission 19, Environmental Justice Australia, p 14; Submission 30, Nature Conservation Council of NSW, p 6.

91 Submission 19, Environmental Justice Australia, p 12.

92 Evidence, Dr Ewald, 15 October 2021, p 20.

93 See, for example, Submission 8, Future Sooner, p 1; Submission 30, Nature Conservation Council of NSW, p 7; Evidence, Mr Belford, 15 October 2021, p 2.

94 Evidence, Mr Moylan, 15 October 2021, p 2.

95 Submission 7, Doctors for the Environment Australia, pp 1-2; Evidence, Dr Ewald, 15 October 2021, p 22.

96 Submission, Future Sooner, p 1; Evidence, Mr Belford, 15 October 2021, p 2.

97 Submission 12, Mr Colin Brodie, p 1.

- A resident 40 kilometers from Vales Point power station in Magenta Shores on the Central Coast stated he suffers from a blocked nose and constant sneezing and his wife suffers from respiratory issues and headaches after inhalation of the black coal ash blown onto their home when there is a north wind.[98]
- A resident close to Eraring and Vales Point power stations stated that she has observed asthma take a hold of the local Central Coast community, particularly children, as well as many individuals with a variety of disabling conditions associated with air pollution around Muswellbrook and Singleton in the Upper Hunter region.[99]
- An intensive care ambulance paramedic on the Central Coast stated that over his 30-year career he attended to many locals with respiratory problems.[100]

Health impacts and burden across NSW

2.38 Numerous submissions argued that pollution from coal-fired power stations travels far across geographical areas and, therefore, its harmful impacts are felt widely across the State.[101] EJA referenced a recent study which found that PM2.5 from coal-fired power stations in NSW contributes to poor air quality in Sydney and beyond, as far north as Lismore and South-East Queensland and as far south as Shepparton in Victoria.[102]

2.39 The Broome study found that 10.5 per cent of urban PM2.5 is attributable to the five coal-fired power stations in NSW and the health impacts are felt in metropolitan Sydney.[103] Dr Broome explained that although the individual health risks from air pollution are relatively low, there is a large public health burden because much of the NSW population is exposed to these low-levels risks.[104] In this regard, Dr Broome explained the findings in his study on the difference between the total quantity of emissions and the total health impact. He indicated that wood heaters have less of an impact in less populated areas and cars have a proportionately higher health impact because they are polluting close to people. Dr Broome highlighted that the health impact of solid particles from coal-fired power stations relative to their emissions is high because solid particles are mostly evenly dispersed across the GMR.[105]

2.40 Some of the reasons for the spread of pollutants from coal-fired power stations were discussed. First, the way in which pollution is emitted from coal-fired power stations was considered to have an impact on the way in which it is spread across NSW and beyond. Healthy Futures

98 Submission 13, Stephen and Ranwi Morris, p 1.

99 Submission 25, Kim Grierson, p 1.

100 Submission 15, Stephen Hogeveen, p 1.

101 See, for example, Submission 7, Doctors for the Environment Australia, p 4; Submission 11, Professor Peter Sainsbury, p 1; Submission 19, Environmental Justice Australia, p 14; Submission 24, Healthy Futures, pp 1-2; Evidence, Mr Witherow, 15 October 2021, p 10.

102 Submission 19, Environmental Justice Australia, p 14, citing Aidan Farrow, Andreas Anhäuser and Lauri Myllyvirta, *Lethal Power: How Burning Coal is Killing People in Australia* (Report, August 2020), pp 5 and 18-19.

103 Submission 24, Healthy Futures, pp 1-2.

104 Evidence, Dr Broome, 15 October 2021, p 37.

105 Evidence, Dr Broome, 15 October 2021, p 39. See also Evidence, Dr Cowie, October 2021, p 21.

advised that the height of the pollution stacks and the temperature and velocity of the emissions means that the pollution can travel far distances.[106]

2.41 Secondly, the breadth of the public health burden is impacted by climatic factors which facilitate the spread or trapping of air pollution. Dr Ewald commented that the pollution from the Central Coast has a larger health burden because summer conditions move the pollution to Sydney where larger numbers of people are affected.[107] A different yet related point is that research by CSIRO indicated that pollution from coal-fired power stations becomes trapped in western Sydney due to temperature inversions.[108]

Costs of the health burden associated with air pollution

2.42 Submissions acknowledged air pollution has a high public health cost.[109] There were different estimates of the cost to the NSW economy reported during the inquiry. The NSW Government's draft *NSW Clean Air Strategy 2021–30* places the air pollution cost at $3.3 billion per year.[110] This figure was based on the Broome study finding that 420 deaths per year are attributable to overall air pollution in the GMR.[111]

2.43 With respect to the cost of pollution from coal-fired power stations, a group of actuaries in 2019 estimated the cost to the Australian economy to be $2.423 billion (Johnson study).[112] This figure was based on the nationwide findings in the Farrow study of 845 low birth-weight births, 14,434 person days of asthma symptoms for 5-19 year-olds and 785 premature deaths attributable to nitrogen oxides, sulphur dioxide and solid particles from coal-fired power stations.[113] In its submission to the inquiry, EJA used the figures in the Farrow study for NSW (see page 15) and costing methods in the Johnson study to estimate that the annual cost to the NSW economy is $1.4 billion – as shown in Table 5.[114]

106 Submission 24, Healthy Futures, pp 1-2.

107 Evidence, Dr Ewald, 15 October 2021, p 22.

108 Evidence, Dr Smith, 15 October 2021, p 13.

109 See, for example, Submission 19, Environmental Justice Australia, p 14; Submission 30, Nature Conservation Council of NSW, p 7.

110 Department of Planning, Industry and Environment, *NSW Clean Air Strategy 2021–30: Draft for Consultation* (Report, March 2021), p 5, https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Air/nsw-clean-air-strategy-2021-30-draft-for-consultation-210080.pdf.

111 Submission 19, Environmental Justice Australia, p 14.

112 Chris Johnson et al, *Costs of Negative Health Outcomes Arising from Air Pollution from Coal-fired Power Stations* (Report, Actuaries Institute of Australia Annual Hackathon August 2020). See, for example, Submission 19, Environmental Justice Australia, pp 14-15; Submission 30, Nature Conservation Council of NSW, p 7.

113 Aidan Farrow, Andreas Anhäuser and Lauri Myllyvirta, *Lethal Power: How Burning Coal is Killing People in Australia* (Report, August 2020), pp 22 and 24. See Submission 19, Environmental Justice Australia, p 15.

114 Submission 19, Environmental Justice Australia, p 15.

Table 5 Estimated health costs Australia-wide and for NSW associated with health impacts from coal-fired power stations

Negative health outcomes	Estimated costs (2019 Australian dollars)					
	Economic		Burden of disease		Total	
	AU	NSW	AU	NSW	AU	NSW
Extra low birthweight live births	$101m	$54m	$275m	$146m	$376m	$200m
Extra person-days of asthma symptoms	$1m	$0.5m	$10m	$5m	$11m	$5.5m
Extra premature deaths	$147m	$89m	$1,890m	$1,148m	$2,036m	$1,237m
Total	$249m	$143.5m	$2,174m	$1,299m	$2,423m	$1,439.2m

Source: Submission 19, Environmental Justice Australia, p 15.

2.44 An alternative method of costing established by Doctors for the Environment Australia, and referenced by the NCC, found the total health burden from coal-fired power stations in NSW is $13 per megawatt of electricity generated per hour.[115]

2.45 With respect to the accuracy of health-cost estimates, EJA argued that they are likely to be conservative because:

- they do not take into account all pollutants from coal-fired power stations and their health impacts
- some figures rely on outdated spatial distribution data rather than current population numbers.[116]

Is current regulation of air pollution from coal-fired power stations in NSW adequate?

2.46 The following section discusses stakeholders' views on whether the current regulation of air pollutants from coal-fired power stations is adequate in light of the public health impacts. First, there is a brief summary of past reforms to the emissions thresholds in the Protection of the Environment Operations (Clean Air) Regulation 2021 (Clean Air Regulation). Next, there is a focus on a comparison between regulation and pollution control technology in NSW and overseas jurisdictions. As stakeholders identified that the Load-Based Licensing Scheme (LBL Scheme) – requiring polluters to pay licence fees for the amount of pollution emitted – is fan alternative approach to achieving the same objective as stricter exceedance limits, stakeholders' views on the effectiveness of the LBL Scheme are also summarised.

115 Submission 30, Nature Conservation Council of NSW, p 8.

116 Submission 19, Environmental Justice Australia, pp 15-16.

Current exceedance limits for air pollutants from coal-fired power stations in NSW

Exceedance limits to drive pollution control technology upgrades

2.47 EJA and the NCC, among others, argued that the current regulation of air pollution from coal-fired power stations is inadequate because the permissible levels of emissions have failed to keep pace with the evidence known about the health impacts of exposure to air pollution.[117] EJA noted that the exceedance limits in the Clean Air Regulation have not been revised since their introduction nearly 25 years ago.[118]

2.48 Both EJA and the NCC also argued that the current regulation of air pollution from coal-fired power stations does not meet the objective of driving industry to reduce emissions to lowest practical levels or to install best available control technology (BACT).[119] Healthy Futures agreed, contending that the exceedance limits in NSW are so high that coal-fired power stations could not actually exceed those limits, even without any BACT. According to Healthy Futures, this outcome is a result of air pollution regulation being executed by environmental regulators without the input of specialist public health agencies.[120]

2.49 In addition, current regulation has not proven to be effective in driving the gradual upgrading of pollution control technology because exemptions can be, and have been, granted to power stations who would have otherwise been subjected to stricter emissions thresholds.[121] EJA explained that amendments to the Clean Air Regulation in 2005 had the effect of subjecting older stations to stricter limits, thus seeking to drive the upgrade or installation of BACT to meet contemporary emissions standards (as discussed in chapter 1). However, those provisions have been ineffective in reducing pollution because not only are the exceedance limits set too high, exemptions from stricter standards are available and have been granted to, for example, Eraring (from Group 6 standards) and Vales Point (from Group 5 standards).[122] Further, Dr Brad Smith, Campaigns Director at the NCC, explained that the last time the Clean Air Regulation required older coal-fired power stations to meet stricter emissions standards was in 2012.[123]

Comparison to international exceedance limits and lowest practical levels of emissions

2.50 Numerous submissions observed that over several decades many overseas jurisdictions have progressively introduced tighter air pollution regulations on coal-fired power stations with the aim and effect of improving air quality through the use of BACT. As a result of progress in those jurisdictions and stagnation of standards in NSW for ten years, the exceedance limits set

117 See, for example Submission 8, Doctors for the Environment Australia, p 1; Submission 19, Environmental Justice Australia, pp 8-10; Submission 24, Healthy Futures, pp 1-2; Evidence, Dr Smith, 15 October 2021, p 18.

118 Submission 19, Environmental Justice Australia, p 9.

119 Submission 19, Environmental Justice Australia, p 3; Submission 30, Nature Conservation Council of NSW, p 5.

120 Submission 24, Healthy Futures, p 3.

121 See, for example, Submission 19, Environmental Justice Australia, pp 9-10; Evidence, Dr Smith, 15 October 2021, p 18.

122 Submission 19, Environmental Justice Australia, pp 9-10.

123 Evidence, Dr Smith, 15 October 2021, p 18.

by the *Protection of the Environment Operations Act 1997* (Act) and the Clean Air Regulation permit much higher levels of pollution than what is allowable in many other countries.[124] According to the Environmental Defenders Office (EDO), regulation of pollutants from coal-fired power stations is therefore far from best practice.[125]

2.51 Specifically, stakeholders informed that the US, European Union (EU), South Korea, China and Japan require lower emissions for solid particles, nitrogen oxides, sulphur dioxide and mercury.[126] Some key comparisons made by stakeholders included that the current exceedance limits in NSW allow for the emission of:

- sulphur dioxide at levels between ten to thirteen times higher than the EU standard for older power stations and twenty-three times the EU standard for newer power stations[127]
- nitrogen oxides at levels between seven to ten times higher than the EU standard and double the emissions than the US standard[128]
- solid particles at six times higher than the EU standard[129]
- mercury at twelve times higher than the EU standard.[130]

2.52 Illustrating the actual amount of pollution from coal-fired power stations compared to international examples, the NCC highlighted that Bayswater power station emits fifty-five times more sulphur dioxide, and seven times more nitrogen oxides, than international best practice standards.[131] Some stakeholders noted that Vales Point has held an exemption under the Clean Air Regulation for ten years allowing the emission of nitrogen dioxide at almost twice the limit prescribed under the Clean Air Regulation and ten times the limit in the EU.[132]

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124 See, for example, Submission 7, Doctors for the Environment Australia, p 1; Submission 8, Future Sooner, p 2; Submission 9, Mr Christopher James, p 2; Submission 10, Centre for Air pollution, energy and health Research, p 2; Submission 11, Professor Peter Sainsbury, p 1; Submission 19, Environmental Justice Australia, p 19; Submission 20, Mr Bruce Buckheit, p 2; Submission 22, Kariong Progress Association, p 1; Submission 30, Nature Conservation Council of NSW, p 8; Submission 31, Clean Air Society of Australia and New Zealand, p 4.

125 Submission 21, Environmental Defenders Office, p 1; Evidence, Ms Rachael Chick, Solicitor, Environmental Defenders Office, 15 October 2021, p 10.

126 See, for example, Submission 7, Doctors for the Environment Australia, p 3; Submission 8, Future Sooner, p 2; Submission 19, Environmental Justice Australia, pp 19-20; Evidence, Mr Belford, 15 October 2021, p 2.

127 See, for example, Submission 7, Doctors for the Environment Australia, p 3; Submission 19, Environmental Justice Australia, p 20; Submission 30, Nature Conservational Council of NSW, p 9; Evidence, Mr Moylan, 15 October 2021, p 6.

128 See, for example, Submission 7, Doctors for the Environment Australia, p 3; Submission 19, Environmental Justice Australia, p 20; Submission 30, Nature Conservational Council of NSW, p 9; Evidence, Mr Moylan, 15 October 2021, p 6.

129 See, for example, Submission 19, Environmental Justice Australia, p 20; Submission 30, Nature Conservational Council of NSW, p 9.

130 See, for example, Submission 19, Environmental Justice Australia, p 20; Submission 30, Nature Conservational Council of NSW, p 9.

131 Submission 30, Nature Conservation Council of NSW, p 8.

132 See, for example, Submission 30, Nature Conservation Council of NSW, pp 5-6; Evidence, Mr Belford, 15 October 2021, p 2.

2.53 Table 6 extracts evidence from several submissions that compared NSW exceedance limits to limits in other countries. Where there was a variance between submissions for a country's exceedance limit, this has been noted within Table 6.

Table 6 NSW exceedance limits compared to international jurisdictions

	Solid particles (mg/m^3)	Nitrogen dioxide or nitric oxide (mg/m^3)	Mercury ($\mu g/m^3$)	Sulphur dioxide (mg/m^3)
NSW	50	1100/1500	50	1700/1900
China	10[133]	50	30	35
Japan	14.3	57.5[134]	10	68.3[135]
South Korea	10	102.5[136]	50	142.5[137]
EU[138]				
Existing stations	2-8	65-150	1-4	10-130
New stations	2-5	65-85[139]	1-2	10-75[140]
US	23	640[141]	1.7/15.7[142]	640[143]

Source: Submission 7, Doctors for the Environment Australia, p 3; Submission 8, Future Sooner, p 2; Submission 19, Environmental Justice Australia, p 20; Submission 20, Mr Bruce Buckheit, p 2.

2.54 Additionally, it was noted how Australia's national air quality standards compare to global standards. In that regard, the WHO Guidelines introduced more stringent thresholds than Australia's national standards set through the National Environment Protection (Air Quality) Measure.[144]

2.55 In response to the view that emissions standards in NSW should more closely reflect international standards, Delta Electricity refuted the appropriateness of using those international standards as a benchmark for reform in NSW. According to Delta Electricity, those standards are inappropriate in the NSW context because those international jurisdictions have heavier population and industry concentration, leading to poorer air quality in those

133 Mr Buckheit stated this limit is 10-30 mg/m^3: Submission 20, Mr Bruce Buckheit, p 3.

134 Mr Buckheit stated this limit is 41.4 mg/m^3: Submission 20, Mr Bruce Buckheit, p 3.

135 Mr Buckheit stated this limit is 65.4mg/m^3: Submission 20, Mr Bruce Buckheit, p 3.

136 Mr Buckheit stated this limit is 28.2 mg/m^3: Submission 20, Mr Bruce Buckheit, p 3.

137 Mr Buckheit stated this limit is 65.4 mg/m^3: Submission 20, Mr Bruce Buckheit, p 3.

138 Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 establishing best available techniques (BAT) conclusions, under *Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants* (notified under document C(2017) 5225) [2015] OJ L 212, tables 3-7.

139 Submission 7, Doctors for the Environment Australia, p 3.

140 Submission 7, Doctors for the Environment Australia, p 3.

141 Mr Buckheit stated this limit is 99 mg/m^3: Submission 20, Mr Bruce Buckheit, p 3.

142 Mr Buckheit noted that the higher limit for ignite plants: Submission 20, Mr Bruce Buckheit, p 3.

143 Mr Buckheit stated this limit is 60 mg/m^3: Submission 20, Mr Bruce Buckheit, p 3.

144 Evidence, Dr Cowie, October 2021, p 21.

countries. As an example, Delta Electricity noted Germany has a population of 83 million (compared to 8 million in NSW), in an area of 360,000 km^2 (compared to 810,000km^2) and a coal-fired power station capacity of 48 gigawatts (compared to 10 gigawatts in NSW).[145]

2.56 Delta Electricity also disagreed with the bill's apparent focus on emissions per volume of gas emitted. In its view, when comparing limits to overseas jurisdictions, the total emissions released into the air and the ground level impacts should be considered which, according to Delta Electricity, has not occurred in setting the exceedance limits in the bill.[146]

Comparison to international use of pollution control technology

2.57 Some forms of pollution control technology to reduce emissions from coal-fired power stations include:

- biomass cofiring which reduces sulphur dioxide
- combustion optimisation for nitrogen oxides
- low nitrogen oxides burners (low NOx burners) that can reduce emissions by up to 50 per cent
- flue gas desulphurisation, also known as wet or dry scrubbers, which can remove up to 99 per cent of sulphur dioxide pollution and remove mercury
- selective catalytic or non-catalytic reduction methods which can reduce over 90 per cent of nitrogen oxides from emissions
- fabric bag filters to reduce solid particles.[147]

2.58 Coal-fired power stations in NSW have fabric filtration technology. In giving evidence Dr Ewald stated that fabric filtration technology was installed at Liddell and Vales Point approximately 15 years ago and the other power stations had this technology installed when built as it was standard practice.[148]

2.59 Only Eraring power station has low NOx burners which were installed in 2012. Participants noted that the low NOx burners have significantly decreased the level of nitrogen oxides emitted from Eraring and its operator, Origin Energy, reported that the low NOx burners have reduced nitrogen dioxide by 40 per cent.[149] Dr Smith reported the NCC's study of the emissions from power stations over a 12-month period found that nitrogen dioxide emissions from Eraring were below 300 milligrams per cub metre (mg/m^3), which is at about half the rate of nitrogen

145 Evidence, Mr Flood, 15 October 2021, p 29.

146 Evidence, Mr Flood, 15 October 2021, p 29.

147 See, for example, Submission 8, Future Sooner, p 2; Submission 9, Mr Christopher James, p 2; Submission 19, Environmental Justice Australia, p 16; Submission 30, Nature Conservation Council of NSW, p 9.

148 Evidence, Dr Ewald, 15 October 2021, p 23.

149 See, for example, Submission 30, Nature Conservation Council of NSW, p 9; Evidence, Mr Belford, 15 October 2021, p 8.

oxides emissions from other power stations in NSW and approximately five times lower than the licence limits for most coal-fired power stations in NSW.[150]

2.60 Several stakeholders contended that NSW has fallen behind many countries when it comes to the installation and use of BACT. It was noted that the US, the EU, South Korea, China and Japan have long employed some or a combination of the abovementioned pollution control technology for managing solid particles, nitrogen oxides, sulphur dioxide and mercury. [151]

2.61 Mr Christopher James, a former air quality regulator from the US, asserted that pollution control technology is very effective and has a proven long-term reliability record.[152] Mr James highlighted the long history of this technology, informing the first flue gas desulphurisation controls were installed in England in 1937 and the first selective catalytic reduction controls for nitrogen oxides emissions were installed in Japan around 1990 and a few years later at some US coal-fired power stations.[153]

2.62 With respect to a requirement to install BACT at coal-fired power stations in the US, it was ten years ago that the US Environment Protection Authority introduced regulation based on BACT to reduce all hazardous air pollutants, including mercury, heavy metal and acid gas emissions.[154]

2.63 In relation to BACT in the EU, the EDO advised that the EU standards require industrial emitters to use BACT to manage pollution from facilities to land, air and water.[155] In 2010 the EU developed BACT requirements for large combustion plants after having undertaken a lengthy and comprehensive review of the performance expected from installing BACT.[156] For example, the EU considers the BACT for nitrogen oxides emissions to be one or a combination of the following to achieve emissions of 65-150 mg/m^3 yearly or daily average of 85-165mg/m^3:

- combustion optimisation
- primary techniques such as air staging, fuel staging, flue-gas recirculation, or low NOx burners
- selective catalytic reduction and selective non-catalytic reduction
- combined techniques for nitrogen oxides and sulphur dioxide reduction.[157]

2.64 As an example of domestic implementation of the EU's BACT policy, the Clean Air Society of Australia and New Zealand's submission noted Germany's use of pollution control technology.

150 Evidence, Dr Smith, 15 October 2021, p 15; Submission 30, Nature Conservation Council of NSW, pp 9-10.

151 See, for example, Submission 19, Environmental Justice Australia, p 19; Submission 20, Mr Bruce Buckheit, p 3; Submission 24, Healthy Futures, p 3.

152 Submission 9, Mr Christopher James, p 2. See also Submission 19, Environmental Justice Australia, p 19.

153 Submission 9, Mr Christopher James, p 2.

154 Submission 19, Environmental Justice Australia, p 19.

155 Submission 21, Environmental Defenders Office, p 3.

156 Submission 19, Environmental Justice Australia, p 19; Evidence, Mr Witherow, 15 October 2021, p 10.

157 Submission 21, Environmental Defenders Office, p 3.

German coal-fired power stations use selective catalytic reduction units for nitrogen oxides removal and a wet flue gas desulphurisation unit in sequence to control solid particles and sulphur dioxide.[158]

The Load-Based Licensing Scheme

2.65 A number of stakeholders noted the relevance of the Load-Based Licensing (LBL) Scheme to this inquiry because it is potentially a different way of achieving the same objective to reduce exceedance limits for the concentration of air pollutants. The LBL Scheme has been under review since 2016.[159]

2.66 The LBL Scheme was established in 1997 and requires polluters to pay licence fees for the amount of pollution they emit.[160] The LBL Scheme implements the 'polluter pays' principle, being one of the objectives of the *Protection of the Environment Administration Act 1991* (PEAA Act). This means that 'those who generate pollution and waste should bear the cost of containment, avoidance or abatement.'[161] The LBL Scheme was developed to financially incentivise polluters to reduce levels of emission by adopting suitable and cost effective technology.[162]

2.67 In terms of the LBL Scheme achieving this objective, some stakeholders commented that the existing fees are too low to have had the effect of requiring the installation of BACT and, consequently, the LBL Scheme has been ineffective in reducing the air pollutants from coal-fired power stations.[163]

2.68 For example, Healthy Futures stated that the fees are 'a tiny fraction of the abatement cost, and a tinier fraction of the health damage cost.'[164] In giving evidence Mr Moylan noted that the fees are set at 2 per cent of the external cost of pollution. He also referenced the research of an environmental scientist, Dr Tiho Ancev from the University of Sydney, which found that while the design of the system is to be held in high regard, the rates are too low to drive down pollution levels.[165]

2.69 EJA and Dr Ewald made reference to research by Doctors for the Environment Australia which estimated that to match the total health burden from coal-fired power stations in NSW of $13

158 Submission 31, Clean Air Society of Australia and New Zealand, p 4.

159 See, for example, Submission 19, Environmental Justice Australia, pp 18-19; Submission 21, Environmental Defenders Office, p 2; Evidence, Mr Moylan, 15 October 2021, p 8.

160 Evidence, Dr Ewald, 15 October 2021, p 24.

161 *Protection of the Environment Administration Act 1991*, s 6(2)(d)(i).

162 Submission 19, Environmental Justice Australia, p 18, citing NSW Environment Protection Authority, *Review of the Load-Based Licensing Scheme* (Issues Paper, October 2016), pp 16–17.

163 See, for example, Submission 19, Environmental Justice Australia, pp 18-19; Evidence, Ms Chick, 15 October 2021, p 17; Evidence, Mr Moylan, 15 October 2021, p 3; Evidence, Dr Ewald, 15 October 2021, p 24.

164 Submission 24, Healthy Futures, p 3.

165 Evidence, Mr Moylan, 15 October 2021, pp 3 and 8.

per megawatt hour, the current load-based licensing unit fee would need to be increased by a factor of 49.[166]

2.70 A private citizen, Mr Les Johnston, contended in his submission that the low fees in the LBL Scheme have allowed coal-fired power stations to view their pollution as a secondary consideration rather than a business cost of generating power.[167]

2.71 The perceived failing of the LBL Scheme to effectively reduce air pollution from coal-fired power stations was viewed by some participants to necessitate the bill's stricter regulatory approach for exceedance limits. Ms Rachael Chick, Solicitor at the EDO, asserted that the failure of the LBL Scheme as a market-based mechanism to implement the 'polluter pays' principle indicates that it is time for a more prescriptive approach to implement this principle, such as stricter exceedance limits.[168] Dr Smith agreed, noting that the bill would achieve effectively the same outcome as was intended by the LBL Scheme with respect to internalising the costs of air pollution.[169]

Purported impacts of the bill

2.72 It was accepted among inquiry participants that enactment of the bill would require coal-fired power stations to install best available control technologies (BACT) so as to comply with the new emission thresholds. This section discusses the key impacts of the bill as identified by stakeholders. One group of stakeholders focused on the resultant reduction in air pollution leading to improved public health outcomes. Whereas industry stakeholders asserted the burden of prohibitive costs of installing BACT and the severe consequential effects on jobs, the industry and reliability of electricity in NSW. These impacts are discussed in turn.

Improved public health outcomes

2.73 Stakeholders outlined the expected benefits of NSW coal-fired power stations installing BACT. First, participants noted that enacting the bill would bring the standards and pollution control technology in NSW closer to international best practice as seen in Europe, North America and North Asia.[170] Mr Belford observed that the bill's proposed standards would bring NSW into alignment with the WHO Guidelines.[171]

2.74 Inquiry participants who supported the bill did so because lower emissions of air pollutants from coal-fired power stations would lead to an improvement in air quality and, in turn, an

166 Doctors for the Environment Australia, Submission to the NSW Environment Protection Authority, *Clean Air for NSW Consultation Paper* (January 2021). See, for example, Submission 19, Environmental Justice Australia, p 19; Submission 30, Nature Conservation Council of NSW, p 8; Evidence, Dr Ewald, 15 October 2021, p 24.

167 Submission 26, Mr Les Johnston, p 1.

168 Evidence, Ms Chick, 15 October 2021, p 17.

169 Evidence, Dr Smith, 15 October 2021, p 19. See also Evidence, Dr Ewald, 15 October 2021, p 24.

170 See, for example, Submission 8, Future Sooner, p 2; Evidence, Dr Ewald, 15 October 2021, p 20; Evidence, Mr Witherow, 15 October 2021, p 10; Evidence, Ms Chick, 15 October 2021, pp 10-11; Evidence, Dr Smith, 15 October 2021, pp 11 and 16.

171 Evidence, Mr Belford, 15 October 2021, p 2.

abatement of the adverse public health impacts.[172] Mr Belford argued that lowering the exceedance limits in the Clean Air Regulation to the levels proposed in the bill would be a simple, immediate and effective way of achieving overall lower emissions.[173]

2.75 Some participants gave evidence quantifying the potential public health improvements if the bill was enacted. For example, the Broome study was referred to, specifically the finding that in the GMR, 38,000 life years would be gained by removing nitrogen dioxide emissions, and 14,000 life years would be gained by removing sulphur dioxide emissions. At the hearing, Dr Broome explained that these findings were reached by comparing two scenarios: one where the level of those emissions remained as they were in 2013 and the other where those emissions are removed. Dr Broome acknowledged that these findings did not account for the impact of any closure of coal-fired power stations which would reduce emissions.[174]

2.76 When asked at the hearing about how many lives could be saved annually if BACT was installed, Dr Ewald recognised the complexity in quantifying the potential improvement in the mortality burden from reduced air pollution:

> That is a tricky question because we do not know the total reduction of pollution that would occur compared to what is allowed now. These standards are for the maximum allowable chimney stack concentration. How that would relate to a change in exposure in ambient air out where people live, that is a complex relationship.[175]

2.77 Nonetheless, Dr Ewald contended that if the exceedance limits in the bill were met, the number of premature deaths each year would be reduced by three quarters. He explained that, in his view, this estimated reduction would apply equally to his approximated 279 premature deaths per year and to Dr Broome's approximated 45 premature deaths per year. Therefore, Dr Ewald asserted that based on his figures, it would be 200 fewer premature deaths per year, and based on Dr Broome's estimates, it would be 20 fewer premature deaths.[176]

2.78 Regarding childhood asthma, Dr Ewald specified that if selective catalytic reduction can eliminate 90 per cent of emissions, the same reduction would be seen for the number of cases of childhood asthma where the asthma is attributable to nitrogen dioxide exposure. Therefore, approximately 5 per cent of those cases of childhood asthma at Lake Macquarie and on the Central Coast could be removed for asthma that is attributable to nitrogen dioxide exposure. Dr Ewald concluded that for both Lake Macquarie and Central Coast LGAs, there would be 300 fewer children with asthma per year in each if selective catalytic reduction was installed at the coal-fired power stations.[177]

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172 See, for example, Submission 7, Doctors for the Environment Australia, pp 1-4; Submission 10, Centre for Air Pollution, Energy and Health Research, p 1; Submission 30, Nature Conservation Council of NSW, p 11; Submission 31, Clean Air Society of Australia and New Zealand, p 4; Evidence, Mr Witherow, 15 October 2021, pp 10 and 12; Evidence, Mr Belford, 15 October 2021, pp 2 and 5.

173 Evidence, Mr Belford, 15 October 2021, p 5. See also Evidence, Mr Nick Witherow, 15 October 2021, p 12; Evidence, Dr Ewald, 15 October 2021, p 20.

174 Evidence, Dr Broome, 15 October 2021, p 38. See also Evidence, Dr Cowie, October 2021, p 21.

175 Evidence, Dr Ewald, 15 October 2021, p 22.

176 Evidence, Dr Ewald, 15 October 2021, p 22.

177 Evidence, Dr Ewald, 15 October 2021, pp 20 and 22.

2.79 Some participants remarked that while it can be a difficult scientific exercise to state with precision what the air quality or health improvements might be from reduced pollution from coal-fired power stations, there is a body of evidence about the impact on air pollution on health and, therefore, any improvement in the amount of air pollution is a worthwhile and necessary pursuit.[178]

2.80 Contrarily, Delta Electricity held a different view about the bill's objective and its impact on public health outcomes.

- The stricter limits proposed in the bill would not result in a discernible improvement in air quality in the GMR.
- The claims that eliminating emissions from coal-fired power stations would prevent all health issues relating to air quality have no foundation in data relating to air quality in NSW.
- If the bill's objective is to improve air quality, sources of air pollution other than coal-fired power stations should have been prioritised.[179]

Cost benefits

2.81 With respect to the cost benefits of the bill, EJA and the NCC referred to the finding in the Broome study that fitting BACT for nitrogen oxides and sulphur dioxide to reduce PM2.5 would create a health benefit of $2.3 billion per year in the GMR.[180] When asked at the hearing about this figure, Dr Broome explained that his study found that from among 5 million people in the GMR, nitrogen dioxide was associated with 38,000 years of life lost, which came at a cost of $1.8 billion, and sulphur dioxide was associated with 14,000 years of life lost, at a cost of $0.66 billion.[181]

Installation of best practice pollution control technology

2.82 As noted above, it was accepted by inquiry participants that in order for coal-fired power stations in NSW to comply with the bill's proposed exceedance limits, the power stations would need to be fitted with BACT.[182]

178 See, for example, Evidence, Mr Witherow, 15 October 2021, p 10; Evidence, Dr Cowie, 15 October 2021, p 26.

179 Evidence, Mr Flood, 15 October 2021, p 29.

180 Submission 19, Environmental Justice Australia, p 15; Submission 30, Nature Conservation Council of NSW, p 8.

181 Evidence, Dr Broome, 15 October 2021, p 39.

182 See, for example, Submission 19, Environmental Justice Australia, p 19; Submission 20, Mr Bruce Buckheit, p 4; Submission 22, Kariong Progress Association, p 1; Submission 28, Dr Heinz-Joachim Muller, p 1; Submission 30, Nature Conservation Council of NSW, p 1; Evidence, Mr Jarvis, 15 October 2021, p 34; Submission 31, Clean Air Society of Australia and New Zealand, p 4; Evidence, Mr Flood, 15 October 2021, p 32; Correspondence from Mr Everett to committee, 21 October 2021; Correspondence from Mr Thomas to committee, 18 October 2021.

2.83 All coal-fired power stations already have fabric bag filters. Regarding Eraring's low NOx burners, Mr Steven Rigby, General Manager of Asset Management and Development at Origin Energy, stated at the hearing that the low NOx burners installed at Eraring in 2012 would not need to be upgraded as they are best available technology for nitrogen oxides control.[183]

2.84 There were different views expressed about the cost of installing BACT, coal-fired generators' capacity to finance this technology and challenges with integrating new controls into existing infrastructure. Industry participants also raised what they considered to be undesirable outcomes for industry jobs and reliability of energy in NSW.

Costs to industry

2.85 During the inquiry evidence was presented about the costs of installing BACT in order for operators of coal-fired power stations to bring the emissions from their assets into compliance with the stricter air pollution exceedance limits proposed by the bill.

2.86 Numerous stakeholders referenced the report by WSP Global (WSP Global Report), commissioned by the Australian Energy Council (AEC), on retrofitting Australian coal-fired power stations with BACT for solid particles, nitrogen oxides and sulphur dioxide control.[184]

2.87 In correspondence to the committee, the AEC noted that the WSP Global Report illustrated that costs for power stations operators to install BACT would be significant. The AEC contended that while cost varies based on the size and type of a unit (as illustrated in Table 7 below) the costs for a single 720 megawatt black coal unit could reach as high as $432 million in capital expenditure and $27 million in annual operating costs.[185] With respect to the costs for industry in totality, Mr Bruce Buckheit, an energy and environmental consultant from the US, specified that based on the cost estimates in the WSP Global Report, the BACT required to comply with the bill's proposed standards would require an investment of $4 billion from the industry over the next eight years.[186]

Table 7 Estimates in WSP Global Report of best available control technology

Power station unit size	Fabric bag filter	Flue gas desulphurisation	Selective catalytic reduction
350 MW Black coal	$36.7m	$187.5m	$51.2m
450 MW Black coal	$42.4m	$212.5m	$58.6m
720 MW Black coal	$67.8m	$277.9m	$88.8m
500 MW Brown coal	$91.4m	$308.7m	$102.1m

Source: Submission 19, Environmental Justice Australia, pp 16-17.

183 Evidence, Mr Steven Rigby, General Manager, Asset Management and Development, Origin Energy, 15 October 2021, p 30.

184 WSP Global, *Design for a Better Future: Considerations for Retrofitting Emissions Control Systems in Australian Coal Power Plants* (Report, September 2020). See also Submission 19, Environmental Justice Australia, p 16; Submission 20, Mr Bruce Buckheit, p 2; Correspondence from Mr Thomas to committee, 18 October 2021, p 1; Correspondence from Mr Everett to committee, 21 October 2021, p 2.

185 Correspondence from Mr Thomas to committee, 18 October 2021, p 1.

186 Submission 20, Mr Bruce Buckheit, pp 3-4.

2.88 In giving evidence Mr Rigby confirmed that the costs in the WSP Global Report are the retrofit costs for installing new fabric filters, wet flue gas desulphurisation and selective catalytic reduction per unit, meaning that the cost would be quadrupled for Eraring as it has four units.[187] Therefore, the total cost is estimated to be $1.72 billion for installation and $104 million in ongoing operating costs.[188]

2.89 While industry stakeholders considered the WSP Global Report figures to be a true indication of costs, others expressed caution about these estimates.[189] EJA asserted that power station operators overestimate the costs of BACT and underestimate the costs of associated benefits. To illustrate this point, EJA drew on the actual cost of the Vales Point's 660MW unit fabric bag filters, which was $55 million in 2007.[190]

2.90 Additionally, the NCC cited the engineering reports, required by the EPA, for installing low NOx burners at Vales Point which estimated the cost to be $33 million in capital expenditure, with $25 million in operating costs over 10 years.[191] Another example was provided by Mr Belford, asserting that the costs of fitting selective catalytic reduction to coal-fired power stations in NSW is between $30 million and $60 million.[192] Further, it was asserted by Mr Witherow and Dr Smith that the cost of BACT is in decline because of their uptake around the world.[193]

2.91 The view was held by some stakeholders that there should be a further review of the costs of installing BACT or an independent expert review of the WSP Global Report. In the submission from private citizen Dr. Heinz-Joachim Muller, it was recommended that an independent panel be established to consider the cost of retrofitting power stations costs so there is less risk of bias for commercial interest impacting the findings.[194]

The case for and against internalising the costs of coal-fired energy generation

2.92 Participants who supported the bill argued that the costs to industry from installing BACT are justified when the following factors are considered:

- the $2.3 billion health cost from NSW coal-fired power stations
- the high profits of coal-fired power station operators
- the scale of costs for major refurbishments at coal-fired power stations, such as a $153 million upgrade to Bayswater to increase capacity and efficiencies, $600 million upgrade works at Eraring during 2010-2012 and another $92 million on upgrades more recently

187 Evidence, Mr Rigby, 15 October 2021, p 31.

188 Answers to questions on notice, Mr Steven Rigby, General Manager, Asset Management and Development, Origin Energy, 2 November 2021, p 1.

189 See, for example, Evidence, Mr Flood, 15 October 2021, p 30; Evidence, Mr Jarvis, 15 October 2021, pp 28 and 31-32; Submission 28, Dr. Heinz-Joachim Muller, p 1; Evidence, Dr Smith, 15 October 2021, p 16.

190 Submission 19, Environmental Justice Australia, p 17.

191 Submission 30, Nature Conservation Council of NSW, p 9.

192 Evidence, Mr Belford, 15 October 2021, p 8.

193 Evidence, Mr Witherow, 15 October 2021, p 15; Evidence, Dr Smith, 15 October 2021, p 16.

194 Submission 28, Dr. Heinz-Joachim Muller, p 1. See also Evidence, Dr Smith, 15 October 2021, p 16.

- the availability of loans to finance the cost of BACT at coal-fired power stations, particularly in the current low interest environment and projected closure dates are far enough in the future for operators to have sufficient time to pay out these loans
- the potential for the costs to be recovered through nominal increases to electricity rates.[195]

2.93 For some or all of these reasons, these stakeholders considered that the costs of retrofitting coal-fired power stations in NSW with BACT are manageable and affordable in the context of the profit margin of power stations.[196] Mr Belford stated that the costs are within the financial capacity of operators 'without resentment or shareholder rebellion.'[197] The NCC contended that the affordability of BACT is demonstrated by the fact that since installing low NOx burners in 2012, Origin Energy (the operator of Eraring) has continued to economically compete in the market and that the technology is widely used overseas.[198]

2.94 Some participants also noted that if operators paid for the costs of BACT installation, the costs of air pollution would be appropriately internalised.[199] Ms Chick argued that currently operators are externalising onto the community the cost of their air pollution.[200] Dr Smith characterised the current situation as an 'economic distortion.'[201] In giving evidence Dr Smith and Mr Witherow agreed that because coal-fired power stations do not pay for the health and human cost of their power generation, operators essentially have their costs subsidised by the public.[202] Therefore, operators bearing the costs of BACT serves to remove the cost from the community, in line with the 'polluter pays' principle in the PEAA Act.[203]

2.95 Contrarily, industry stakeholders noted several reasons as to why the costs are unjustified or prohibitive. First, Delta Electricity contended that when considering air quality data from the NSW Government, there is no case for implementing such costly pollution control technology.[204]

2.96 Secondly, both Delta Electricity and Origin Energy considered that these costs would make the power stations economically unviable. Mr Jarvis stated that the cost of several hundred million dollars per unit for its Eraring power station would cause it – Australia's largest coal-fired power station – to close, thus significantly impacting the reliability and affordability of the NSW

195 See, for example, Submission 9, Mr Christopher James, p 2; Submission 19, Environmental Justice Australia, pp 16-18; Submission 20, Mr Bruce Buckheit, pp 3-6; Evidence, Mr Witherow, 15 October 2021, p 14.

196 See, for example, Submission 8, Future Sooner, p 2; Submission 19, Environmental Justice Australia, p 18; Submission 20, Mr Bruce Buckheit, p 4; Evidence, Mr Belford, 15 October 2021, p 2; Evidence, Dr Smith, 15 October 2021, p 11.

197 Evidence, Mr Belford, 15 October 2021, p 8.

198 Evidence, Dr Smith, 15 October 2021, p 15.

199 See, for example, Submission 19, Environmental Justice Australia, p 17; Submission 30, Nature Conservation Council of NSW, p 9.

200 Evidence, Ms Chick, 15 October 2021, p 17.

201 Evidence, Dr Smith, 15 October 2021, p 15.

202 Evidence, Dr Smith, 15 October 2021, p 17; Evidence, Mr Witherow, 15 October 2021, p 17.

203 Evidence, Ms Chick, 15 October 2021, p 17.

204 Evidence, Mr Flood, 15 October 2021, p 29; Correspondence from Mr Everett to committee, 21 October 2021, p 1.

electricity system. Mr Jarvis stated that the profits from Eraring power station are 'very marginal' as it operates at a different capacity nowadays and this will continue until its planned closure in 2032. Therefore, raising capital or borrowing is difficult.[205]

2.97 With respect to prohibitive costs for Delta Electricity, Mr Everett explained a similar position to Origin Energy and outlined the following financial challenges in relation to installing BACT at Vales Point.

- A standard return on investment would not be possible for pollution control technology at Vales Point.
- Obtaining investment would be almost impossible because in the current market borrowing capacity for coal entities is low.
- The financial position of Vales Point would be damaged by its units being out of service for an extended period for installation of the technology.
- The length of time (discussed below) and capital expenditure it would take to install the technology when considered in the context of the projected closure of Vales Point means that installing BACT is not a prudent financial decision.[206]

2.98 In that regard, Delta Electricity argued that the proponents of the bill have not considered the impacts to industry and the reliability of energy, nor costs to consumers:

> Delta reiterates that the standards proposed in the Clean Air Bill 2021 … represent unbalanced regulation, as no consideration has been given to the cost to industry of the regulation, the flow-on cost to consumers or the energy security consequences in New South Wales.[207]

2.99 Conversely, when asked at the hearing about the balance between the health costs borne by the community and the cost to coal-fired power stations to install BACT, Dr Smith reflected on the importance of the right to breathe clean air:

> I think the question of whether it is reasonable to require the power stations to fit best practice controls in a way is the same as the question of do we believe the people of New South Wales have the right to breathe healthy air. And I think most people would say the answer is yes.[208]

Closure of coal-fired power stations in NSW

2.100 Coal-fired power stations in NSW are expected to close by 2050. The first of the five currently operating stations to close will be Liddell in 2023, followed by Vales Point in 2029, then Eraring

205 Evidence, Mr Jarvis, 15 October 2021, pp 28 and 31-32.

206 Correspondence from Mr Everett to committee, 21 October 2021, p 2; Evidence, Mr Everett, 15 October 2021, p 33. See also Submission 31, Clear Air Society of Australia and New Zealand, p 3.

207 Evidence, Mr Flood, 15 October 2021, p 30.

208 Evidence, Dr Smith, 15 October 2021, p 16.

in 2032, Bayswater in 3035 and Mount Piper in 2042, which has an extension of life plan until 2049.[209]

2.101 It was recognised by participants that the closure of the coal-fired power stations will lead to improvements in air quality.[210] There were differing views about the merit of imposing stricter exceedance limits on coal-fired power stations in the context of their foreshadowed closure.

2.102 For example, Mr Jarvis characterised the bill's proposed standards as 'disproportionately stringent' given that coal-fired power stations in NSW have limited remaining lifespan and air quality is considered generally good against international standards.[211] Moreover, the transition is underway to renewable energy which will significantly reduce power sector pollution emissions by the end of the decade.[212]

2.103 A contrasting view expressed was that the anticipated retirement of coal-fired power stations should not deter action to improve air quality and reduce adverse health outcomes between now and their closure.[213] According to the NCC, inaction of this issue would see thousands of avoidable deaths and asthma cases in the intervening decades.[214] In the view of Mr Buckheit, if pollution controls are not required and introduced in the short-term, the case for introducing them in the future is weakened as there is less time until retirement of these power stations.[215]

Early permanent or temporary closure of coal-fired power stations

2.104 Both Delta Electricity and Origin Energy informed the committee that if the bill was enacted, Vales Point and Eraring would be forced to close because they would not be able to meet the tighter thresholds to be introduced by the bill.[216]

2.105 For Vales Point, Mr Flood stated that because the new standards would have immediate effect, it would need to immediately cease operation until BACT was installed because current emission levels would exceed the new standards introduced by the bill.[217]

2.106 Delta Electricity indicated the stages and timeframes for implementing BACT for nitrogen oxides and sulphur dioxide, estimating a total of four to six years until operational:

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209 Submission 19, Environmental Justice Australia, p 18, citing Australian Energy Market Operator, *Generating Unit Expected Closure Year – May 2021* (Report, 10 May 2021).

210 Evidence, Ms Sarah Balmanno, Manager Strategic Policy and Programs, Climate Change and Sustainability Division, Energy, Environment and Science Group, Department of Planning, Industry and Environment, 15 October 2021, p 41.

211 Evidence, Mr Jarvis, 15 October 2021, p 28.

212 Evidence, Mr Flood, 15 October 2021, p 29.

213 See, for example, Submission 30, Nature Conservation Council of NSW, p 3; Evidence, Mr Belford, 15 October 2021, p 2.

214 Submission 30, Nature Conservation Council of NSW, p 3; Evidence, Dr Smith, 15 October 2021, p 17.

215 Submission 20, Mr Bruce Buckheit, p 7.

216 Evidence, Mr Flood, 15 October 2021, p 32; Evidence, Mr Jarvis, 15 October 2021, p 28. See also Submission 31, Clean Air Society of Australia and New Zealand, p 3.

217 Evidence, Mr Flood, 15 October 2021, p 32.

- design – 6 to 12 months
- environmental impact statement preparation and obtaining assessment requirements from the Department of Planning, Industry and Environment – 12 to 18 months
- approvals, public exhibition and preparation of a response to submissions – 6 to 12 months
- tender contracts – 6 to 12 months
- construction and commission – 12 to 24 months.[218]

2.107 For Eraring, Mr Jarvis described that it would be likely forced to cease coal-fired energy generating indefinitely. As discussed above, Mr Jarvis informed that the cost of installing BACT at Eraring would be financially prohibitive and therefore would force the early closure of the power station, currently slated for 2032.[219] In agreeance, the AEC and Delta Electricity cautioned that all coal-fired generators would be placed in the same or similar financial position. In their view, if the bill was enacted, it would trigger a disorderly early closure of multiple coal-fired power stations at the same time.[220]

2.108 Both Delta Electricity and Origin Energy described the impact of early closures on jobs. Delta Electricity stated it employs approximately 500 people at Vales Point power station and the adjacent coal mine.[221] Origin Energy explained that the closure of Eraring would impact 300 employees and 500 shorter term annual maintenance jobs, as well as the local coal mines.[222]

2.109 Another impact identified by industry was the reliability of the energy grid, which is the power system's capacity to meet consumer demand. Delta Electricity and Origin Energy explained that the Australian Energy Market Operator (AEMO) has reported there are existing issues with the reliability of energy in NSW. The electricity companies noted that AEMO anticipates these issues will be compounded upon the closure of Vales Point in 2029, with the consequence of critical shortages of dispatchable power generation in NSW.[223]

2.110 Delta Electricity was concerned about the significant impact additional closures of coal-fired power stations would have on the energy supply in NSW:

> Post the Liddell closure, the early closure of even one more major plant, let alone all coal fired power stations in NSW, would present an immediate energy crisis in NSW at a time when the industry is already under very significant financial strain because of the transition towards higher levels of renewables in the National Electricity Market.[224]

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218 Evidence, Mr Flood, 15 October 2021, pp 29 and 32; Correspondence from Mr Everett to committee, 21 October 2021, p 2.

219 Evidence, Mr Jarvis, 15 October 2021, pp 28 and 31.

220 Correspondence from Mr Everett to committee, 21 October 2021, p 3; Correspondence from Mr Thomas to committee, 18 October 2021, p 1.

221 Evidence, Mr Flood, 15 October 2021, p 33.

222 Evidence, Mr Rigby, 15 October 2021, p 33.

223 Evidence, Mr Everett, 15 October 2021, p 33; Correspondence from Mr Everett to committee, 21 October 2021, p 3.

224 Correspondence from Mr Everett to committee, 21 October 2021, p 4.

2.111 Mr Jarvis highlighted that while committed to exiting coal-fired power generation, coal-fired power stations are important in ensuring reliability in the energy system during the transition to renewable energy to 'keep the lights on':[225]

> It is important that government and industry work together to make the transition to net zero as seamless as possible for customers. The renewables will be built and the coal plant will exit. Existing coal plants will have a critical role in maintaining a reliable and affordable supply of electricity through the transition to net zero.[226]

2.112 In response to the argument that installing BACT poses a risk to the reliability of the electricity market, Mr Witherow contended that the challenges of installing the technology are not insurmountable. He explained that the technology could be installed alongside the units while in operation and during scheduled outages they can 'tie-in' the pollution controls to the existing infrastructure, which can take approximately six weeks.[227]

2.113 Likewise, Mr Buckheit considered that the BACT which would be required in NSW to meet the bill's exceedance limits is already widespread overseas. In his view, there are no challenges unique to the NSW context to render the installation of this technology unfeasible:

> The controls that would be required by CAB 2021 have been installed in hundreds, if not thousands of applications throughout the world, over a broad range of site and environmental operating conditions. Thus far, NSW [coal-fired power station] operators have not contracted for the engineering services necessary to design and construct these devices and so have no basis to assert that there are technical risks that have not been addressed and resolved in those installations.[228]

2.114 A third scenario was presented by Mr Witherow with respect to how the bill may lead to the early closures of power stations. He noted that when BACT was required for coal-fired power stations in the US, dates were set in the future for when stricter exceedance limits would take effect to allow for operators to enter into negotiation with regulators to exchange earlier closure of power stations for an exemption from the stricter standards for a very limited period of time until closure.[229]

Suggested amendments to the bill

2.115 This section outlines participants' recommended amendments to the bill. The two key suggested amendments related to lowering the exceedance limits for each air pollutant to more closely align with best practice and international standards and, secondly, introducing transitory provisions to facilitate the installation of BACT with minimal impacts on electricity supply.

225 Evidence, Mr Jarvis, 15 October 2021, p 34.

226 Evidence, Mr Jarvis, 15 October 2021, p 28.

227 Evidence, Mr Witherow, 15 October 2021, p 12.

228 Submission 20, Mr Bruce Buckheit, p 6.

229 Evidence, Mr Witherow, 15 October 2021, p 16.

Are the bill's proposed exceedance limits sufficient?

2.116 Many of the stakeholders who supported the bill considered that while the proposed exceedance limits are a step in the right direction and would significantly improve current emissions regulation, the limits should be stricter so as to align with international standards.[230] The EDO observed that the standards in the bill allow for greater emissions than EU standards.[231] Likewise, Future Sooner characterised it as paramount that emission controls equal to those in Europe are installed in NSW.[232]

2.117 EJA argued that if BACT was installed at coal-fired power stations in NSW, even lower levels of emissions than what is proposed in the bill could be achieved.[233] Along similar lines, Mr James submitted that with modern pollution control, lower levels of emissions could be achieved than proposed in the bill. For example, coal-fired power stations with selective catalytic reduction could achieve nitrogen oxides emissions of 70-100 mg/m^3, and with flue gas desulphurisation could achieve sulphur dioxide emissions of less than 50 mg/m^3.[234]

2.118 To this end, based on the low levels of emissions that have been achieved in the EU for existing coal-fired power stations with BACT, EJA proposed lower exceedance limits which align with the EU standards, as illustrated below in Table 8.[235] In giving evidence Mr Witherow maintained that the standards proposed by the bill significantly move the standards towards best practice, but they do not go far enough.[236]

Table 8 Proposal for stricter exceedance limits

	EU - Annual average (mg/m^3)	EU - Short term (daily or reference test) (mg/m^3)	NSW – Proposed standard in the bill (mg/m^3)
Solid particles	2-8	3-11	20
Nitrogen oxides	65-150	<85-165	200
Mercury	<1-4 ($\mu g/m^3$)	<1-4 ($\mu g/m^3$)	1.5 ($\mu g/m^3$)
Sulphur dioxide	10-130	25-165	200

Source: Submission 19, Environmental Justice Australia, p 21.

230 See, for example, Submission 9, Mr Christopher James, p 2; Submission 19, Environmental Justice Australia, p 21; Submission 20, Mr Bruce Buckheit, p 2.

231 Submission 21, Environmental Defenders Office, p 2.

232 Submission 8, Future Sooner, p 2.

233 Submission 19, Environmental Justice Australia, p 21.

234 Submission 9, Mr Christopher James, p 2.

235 Submission 19, Environmental Justice Australia, p 21. See Commission Implementing Decision (EU) 2017/1442 of 31 July 2017 establishing best available techniques (BAT) conclusions, under *Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants* (notified under document C(2017) 5225) [2015] OJ L 212, tables 3-7.

236 Evidence, Mr Witherow, 15 October 2021, p 13.

2.119 Similarly to EJA, Mr Buckheit considered the proposed standards in the bill to be 'conservative' as they do not require lowest level of emissions possible with BACT and recommended they be considered a maximum emission limit:

> Rather, the proposed limits represent reasonable "mainstream'" application of today's technologies over a variety of underlying power station design and coal/ lignite choices and provide an ample margin of compliance for the range of NSW [coal-fired power stations]. These limits should be considered as an "upper bound" of acceptable emission limits in that less stringent limits would not require use of the most effective pollution control technologies.[237]

2.120 On the other hand, Delta Electricity and Origin Energy opposed the bill and argued that the proposed limits are disproportionately stringent when considering air quality data, the cost of the technology, the remaining lifespan of coal-fired electricity in NSW, the possibility of power stations closing prematurely and impacts on energy supply.[238]

Commencement and transition provisions

2.121 If enacted in its current form, the bill would commence on the date of assent.[239] EJA, among others, recognised challenges with the bill's immediate commencement.[240] In that regard, it was acknowledged that installing BACT requires time, preparation, planning and testing and, where possible, installation should align with scheduled outages to minimise outages and maintain electricity supply.[241] Therefore, it was suggested by several stakeholders who supported the bill that its commencement be amended.

2.122 Alternative ways of achieving an orderly installation of BACT at coal-fired power stations in NSW were proposed, including amending the bill so that:

- negotiation between the NSW EPA and coal-fired power station operators may occur to set timeframes for compliance, seeking to balance any delay to abating adverse public health outcomes with reasonable timelines for industry for planning, installation, testing and commission of BACT[242]
- installation of BACT is gradational to fit with scheduled outages in the National Electricity Market
- three years after commencement of the bill, each operator of coal-fired power stations in NSW is required to control a set percentage of its generating capacity each year

237 Submission 20, Mr Bruce Buckheit, p 2.

238 See, for example, Evidence, Mr Jarvis, 15 October 2021, p 28; Correspondence from Mr Everett to committee, 21 October 2021, pp 1-4.

239 Protection of the Environment Operations Amendment (Clean Air) Bill 2021, cl 2.

240 See, for example, Submission 19, Environmental Justice Australia, p 22; Submission 20, Mr Bruce Buckheit, p 6; Submission 30, Nature Conservation Council of NSW, pp 2 and 11-12.

241 See, for example, Submission 19, Environmental Justice Australia, p 19; Submission 30, Nature Conservation Council of NSW, p 11.

242 Submission 30, Nature Conservation Council of NSW, p 12.

- dates are set for the retrofit of specific stations.[243]

2.123 The NCC preferred the first approach. To facilitate this negotiation, the NCC claimed that a clear timeline of operators' existing and projected major upgrades and maintenance would be needed to inform the timeframe for when BACT can be installed.[244] Whereas EJA recommended the bill be amended to commence on an appropriate later date, namely sometime in 2024.[245]

2.124 Mr Buckheit instead recommended the fourth approach whereby specific dates for retrofits would be included in the bill. Mr Buckheit advocated including in the bill the suggested installation schedule in EJA's policy paper *The People's Clean Air Action Plan for NSW*.[246] Mr Buckheit asserted that the suggested schedule ensures adequate electricity supply during the period of shut down to allow for the 'tie in' of the technology because the installations:

- are staggered across the coal-fired power stations in NSW
- occur during spring and autumn when demand is at its lowest
- are limited to no more than one unit at any power station at any time
- are phased over several years.[247]

2.125 The suggested retrofit dates in EJA's policy paper for each of the power stations are:

- Eraring: spring 2024, autumn 2025, spring 2025, autumn 2026
- Bayswater: spring 2025, autumn 2026, spring 2026, autumn 2027
- Liddell: none due to retirement in 2022
- Mount Piper: spring 2024 and autumn 2025
- Vales Point: spring 2026 and autumn 2027.[248]

Mechanism for future lowering of exceedance limits

2.126 The EDO expressed support for the introduction of a mechanism to allow for the further lowering of limits in the future with the objective of aligning NSW standards with current best practice.[249] Ms Chick explained at the hearing that one way of including this in the bill would be to have a provision requiring industrial emitters to use best available techniques or technologies.[250]

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243 Submission 19, Environmental Justice Australia, p 22, citing Environmental Justice Australia, *The People's Clean Air Action Plan for NSW* (Policy Paper, 2021), p 16.

244 Submission 30, Nature Conservation Council of NSW, pp 11-12.

245 Submission 19, Environmental Justice Australia, p 22.

246 Environmental Justice Australia, *The People's Clean Air Action Plan for NSW* (Policy Paper, 2021), p 16.

247 Submission 20, Mr Bruce Buckheit, p 6.

248 Submission 19, Environmental Justice Australia, Attachment, p 16.

249 Submission 21, Environmental Defenders Office, p 3.

250 Evidence, Ms Chick, 15 October 2021, p 11.

Exemptions from exceedance limits

2.127 As discussed earlier in this chapter, according to the NCC, one of the key weaknesses of current regulation is the availability of exemptions for coal-fired power stations from prescribed standards. The NCC, among many individual participants, stipulated that there should be no possibility of exemptions for coal-fired power stations to emit air pollutants over the standards as prescribed in the Act or in the Clean Air Regulation.[251]

Alternative and more appropriate mechanism required

2.128 While not a proposed amendment to the bill, the Clean Air Society of Australia and New Zealand (CASANZ) submitted that the bill is not an appropriate mechanism for tightening regulation of air pollutant concentrations from coal-fired power stations. CASANZ contended that in line with the provisions of the *Subordinate Legislation Act 1989* and regulation principles, proposed changes such as those in the bill must be supported by a Regulatory Impact Statement (RIS). A RIS would examine regulatory alternatives, the economic and social costs and benefits and provide a consultation process.[252]

Does the bill propose enforceable regulation?

2.129 The Department of Planning, Industry and Environment argued that the bill would not only be unenforceable but it also risks undermining current air pollution standards:

> The NSW Environment Protection Authority (EPA) advises that the proposed limits in the Protection of the Environment Operations Amendment (Clean Air) Bill 2021 are unenforceable because they do not specify the measurement technique, reference conditions, nor averaging period needed to enable industry to understand the standards they must meet and the EPA to enforce them. The Protection of the Environment Operations (Clean Air) Regulation 2021 currently specifies these parameters for all air standards. Without specifying this information, it is impossible to say whether the Bill actually imposes more stringent standards, or in fact erodes current standards which could impact on air quality in NSW and the health of the community.
>
> The current NSW clean air regulation and EPA-issued environment protection licences operate together to specify the actual environmental performance that is required for each power station. This enables the EPA to adaptively manage these limits for the specific circumstances of the power stations and air sheds they are located in.[253]

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251 See, for example, Submission 11, Professor Peter Sainsbury, p 1; Submission 14, Name Suppressed, p 1; Submission 15, Mr Stephen Hogeveen, p 1; Submission 18, Mr Andreas Dalman, p 1; Submission 22, Kariong Progress Association, p 1; Submission 23, Kariong Eco Garden, p 1; Submission 29, Jenny Hughes, p 1; Submission 30, Nature Conservation Council of NSW, p 7; Evidence, Mr Belford, 15 October 2021, p 2.

252 Submission 31, Clean Air Society of Australia and New Zealand, pp 1-2.

253 Answers to questions on notice, Ms Sarah Balmanno, Manager Strategic Policy and Programs, Climate Change and Sustainability Division, Energy, Environment and Science Group, Department of Planning, Industry and Environment, 29 October 2021, pp 1-2.

Committee comment

2.130 Over the last decade it has become clearer that a multitude of diseases, illnesses and premature deaths are attributable to air pollution exposure.

2.131 While the committee accepts the evidence that Australia and NSW generally enjoy relatively good air quality, it also accepts that there is no safe level of exposure to air pollution. The committee acknowledges that coal-fired power stations in NSW are emitting air pollution at concentration levels above their international counterparts. The committee also notes that regulation of air pollution from coal-fired power stations in the United States, European Union, Japan, South Korea and China has kept better pace with the evidence on health impacts, requiring the installation and use of best available control technology to mitigate the harm to their population's health.

2.132 Coal-fired power stations in NSW are lagging behind their overseas counterparts in reducing their harmful health impacts due to comparatively relaxed regulation that has failed to drive the upgrading and installation of pollution control technology. The committee considers it timely that this is addressed and considers that the stricter thresholds for concentration of solid particles, nitrogen oxides, sulphur dioxides and mercury in the bill would achieve this objective. The current thresholds have not been revised in 25 years. While the NSW Government recently consulted on its draft *NSW Clean Air Strategy 2021–30*, this strategy includes no additional measures to address air pollution from coal-fired power stations.

2.133 Cognisant of the evidence from industry about the impacts of installing best available control technology on their operations and the pressure under which the electricity grid may be placed as a result, the committee acknowledges that transition provisions may be required to facilitate installation of the necessary technology so that there is minimal disruption to energy supply in NSW. To that end, the committee recommends the Legislative Council proceed to debate the bill and the committee comments and stakeholders' views expressed in this report be addressed during debate in the House, particularly in relation to transition measures and provisions.

Recommendation 1

That the Legislative Council proceed to debate the Protection of the Environment Operations Amendment (Clean Air) Bill 2021 and the committee comments and stakeholders' views expressed in this report be addressed during debate in the House, particularly in relation to transition measures and provisions.

Appendix 1 Submissions

No.	Author
1	Mr Karl Augustine
2	Ms Sarah Avery
3	Mr David Taylor
4	Mr Steve Truscott
5	Name suppressed
6	Mr Terry Holdom
6a	Mr Terry Holdom
7	Doctors for the Environment Australia
8	Future Sooner
9	Mr Christopher James
10	Centre for Air pollution, energy and health Research (CAR)
11	Professor Peter Sainsbury
12	Mr Colin Brodie
13	Mr Stephen and Ranwi Morris
14	Name suppressed
15	Mr Stephen Hogeveen
16	Miss Maryellen Flynn
17	Mr Graeme Tychsen
18	Mr Andreas Dalman
19	Environmental Justice Australia
20	Mr Bruce Buckheit
21	Environmental Defenders Office
22	Kariong Progress Association
23	Kariong Eco Garden
24	Healthy Futures
25	Kim Grierson
26	Les Johnston
27	Community Environment Network (Central Coast)
28	Dr Heinz-Joachim Muller
29	Miss Jenny Hughes
30	Nature Conservation Council of NSW
31	Clean Air Society of Australia and New Zealand

No.	Author
32	Dr Arthur Chesterfield-Evans
33	Gary Blaschke OAM

Appendix 2 Witnesses at hearing

Date	Name	Position and Organisation
Friday 15 October 2021 **Via videoconference**	Mr Will Belford	Spokesperson Future Sooner
	Mr Jonathan Moylan	NSW Clean Air Campaigner Healthy Futures
	Mr Michael Campbell OAM	Executive Member Community Environment Network (Central Coast)
	Mr Nick Witherow	Principal Lawyer Environmental Justice Australia
	Ms Rachael Chick	Solicitor Environmental Defenders Office
	Dr Brad Smith	Campaigns Director Nature Conservation Council of NSW
	Dr Ben Ewald	Convenor Air Pollution Special Interest Group, Doctors for the Environment Australia
	Dr Christine Cowie	Affiliate Centre for Air Pollution, Energy and Health Research
	Mr Greg Jarvis	Executive General Manager, Energy Supply and Operation, Origin Energy
	Mr Steven Rigby	General Manager, Asset Management and Development, Origin Energy
	Mr Greg Everett	Chief Executive Delta Electricity
	Mr Justin Flood	Executive Manager Sustainability, Delta Electricity

Date	Name	Position and Organisation
	Ms Sarah Balmanno	Manager Strategic Policy and Program Climate Change and Sustainability Division, Energy, Environment and Science Group Department of Planning, Industry and Environment
	Dr Richard Broome	Acting Executive Director Health Protection NSW, NSW Health

Appendix 3 Minutes

Minutes no. 50
Thursday 13 May 2021
Portfolio Committee No. 7 – Planning and Environment
Members' Lounge, Parliament House, 1.41 pm

1. Members present
Ms Faehrmann, *Chair*
Mr Pearson, *Deputy Chair* (from 1.43 pm)
Mr Buttigieg
Ms Cusack
Mr Franklin
Mr Mallard (from 1.50 pm)
Ms Sharpe (from 1.43 pm)
Ms Boyd (from 1.42 pm, participating for the inquiry into Protection of the Environment Operations Amendment (Clean Air) Bill 2021)

2. Previous minutes
Resolved, on the motion of Mr Franklin: That draft minutes nos. 43, 44 and 45 be confirmed.

3. Correspondence
The committee noted the following items of correspondence:

Received:

- 26 March 2021 – Email from Mr Peter Poulos, Office of Minister Kean to secretariat, requesting an extension until 29 March 2021 for post hearing responses for the Energy and Environment portfolio
- 29 March 2021 – Letter from Dr Georgina Kelly, Executive Director, NSW Department Planning Industry and Environment, to secretariat, clarifying evidence given during the hearing on 2 March 2021
- 8 April 2021 – Letter from Mr Steve Beaman PSM, Acting Chief Executive Officer, NSW Environment Protection Authority to secretariat, clarifying evidence given during the hearing on 2 March 2021
- 8 April 2021 – Letter from Dr Atticus Fleming, Deputy Secretary, National Parks and Wildlife Service to secretariat, clarifying evidence given during the hearing on 2 March 2021
- 8 April 2021 – Letter from Professor Mary O'Kane, Chair, Independent Planning Commission to secretariat, clarifying evidence given during the hearing on 9 March 2021.
- 12 May 2021 – Email from Ms Abigail Boyd to secretariat, notifying that she wishes to be a participating member on the Inquiry into the Clean Air Bill.

Sent:

- 5 March 2021 – Email from the secretariat to the Hon Matt Kean MP, Minister for Energy and Environment, attaching transcript of evidence with questions on notice highlighted and supplementary questions
- 12 March 2021 – Email from the secretariat to the Hon Rob Stokes MP, Minister for Planning and Public Spaces, attaching transcript of evidence with questions on notice highlighted and supplementary questions
- 16 March 2021 – Email from the secretariat to the Hon Shelley Hancock MP, Minister for Local Government, attaching transcript of evidence with questions on notice highlighted and supplementary questions
- 29 March 2021 – Email from the secretariat to Mr Peter Poulos, Office of Minister Kean, confirming extension until 29 March 2021 for post hearing responses for the Energy and Environment portfolio
- 31 March 2021 – Email from the secretariat to Ms Sarah Wademan, Office of Minister Kean, seeking formal letter from Mr Steve Beaman PSM, Acting Chief Executive Officer, NSW Environment

Protection Authority and Dr Atticus Fleming, Deputy Secretary, National Parks and Wildlife Service clarifying evidence given at the Energy and Environment hearing on 2 March 2021.

4. Inquiry into Budget Estimates 2020-2021

4.1 Answers to questions on notice and supplementary questions

The committee noted that the following answers to questions on notice and supplementary questions were published by the committee clerk under the authorisation of the resolution establishing the Inquiry:

- answers to questions on notice and supplementary questions from the Hon Matt Kean MP, Minister for Energy and Environment, received 29 March 2021
- answers to questions on notice and supplementary questions from the Hon Rob Stokes MP, Minister for Planning and Public Spaces, received 6 April 2021
- answers to questions on notice and supplementary questions from the Hon Shelley Hancock MP, Minister for Local Government, received 6 April 2021.

4.2 Consideration of Chair's draft report

4.3 The Chair submitted her draft report entitled Budget Estimates 2020-2021, which, having been previously circulated, was taken as being read.

5. Resolved, on the motion of Ms Cusack: That:

a) The draft report be the report of the committee and that the committee present the report to the House;

b) The transcripts of evidence, tabled documents, answers to questions on notice and supplementary questions, and correspondence relating to the inquiry be tabled in the House with the report;

c) Upon tabling, all unpublished transcripts of evidence, tabled documents, answers to questions on notice and supplementary questions, and correspondence relating to the inquiry, be published by the committee, except for those documents kept confidential by resolution of the committee;

d) The committee secretariat correct any typographical, grammatical and formatting errors prior to tabling;

e) That the report be tabled on 18 May 2021.

6. Inquiry into the rationale for, and impacts of, new dams and other water infrastructure in NSW

6.1 Future conduct of the inquiry

Resolved, on the motion of Mr Pearson: That the committee table Part 2 of the report by 30 July 2021, and Part 3 of the report at a later date, which will address the final business cases once released, and any other related matter.

6.2 Consideration of revised NSW Government supplementary submission

Resolved, on the motion of Mr Sharpe: That the Chair respond in writing to the Department of Planning, Industry and Environment inviting them to make a further submission making any necessary clarifications, and treat the revised supplementary submission as correspondence.

7. Inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021

7.1 Terms of reference

The committee noted the following terms of reference referred by the House on 11 May 2021:
That:

(a) the Protection of the Environment Operations Amendment (Clean Air) Bill 2021 be referred to Portfolio Committee No. 7 – Planning and Environment for inquiry and report,
(b) the bill be referred to the committee at the conclusion of the mover's second reading speech,
(c) the committee report by 27 August 2021.

7.2 Closing date for submissions
Resolved on the motion of Mr Pearson: That the closing date for submissions be 30 June 2021.

7.3 Stakeholder list
Resolved on the motion of Mr Pearson: That the secretariat email members with a list of stakeholders to be invited to make written submissions, and that members have one day from the email being circulated to nominate additional stakeholders.

7.4 Advertising
All inquiries are advertised via Twitter, Facebook, stakeholder letters and a media release distributed to all media outlets in New South Wales.

It is no longer standard practice to advertise in the print media. The committee should pass a resolution if it wishes to do so.

7.5 Hearing dates
Resolved on the motion of Mr Pearson: That the committee hold one hearing in July 2021, the date of which is to be determined by the Chair after consultation with members regarding their availability.

7.6 Provision of documents to participating member
Resolved on the motion of Mr Pearson: That Ms Boyd, who has advised the committee that she intends to participate for the duration of the this inquiry, be provided with copies of meeting papers and unpublished submissions.

8. Consideration of terms of reference
The Chair tabled the letter proposing the following self-reference:

Inquiry into the land rezoning and acquisition supporting the Western Sydney Aerotropolis

That Portfolio Committee No. 7 – Planning and Environment inquire into and report on the planning, rezoning and acquisition of land by NSW Government agencies in relation to the Western Sydney Aerotropolis, with particular reference to:

(a) how government agencies identified land for rezoning or acquisition,
(b) the extent to which modelling and option assessments were conducted to minimise the adverse impact on landowners,
(c) the extent to which land values and the identity of landowners were taken into account in determining the planning outcomes,
(d) landowner access to, and lobbying of, departmental officials, representatives or decision makers,
(e) how government agencies conducted negotiations with landholders in relation to rezoning or acquiring land or other rights prior to, or in parallel with, the compulsory acquisition process, and the extent to which such process is conducted on a fair, unbiased and equitable basis,
(f) the interaction of the planning, infrastructure and transport planning systems of government to support best practice outcomes for the NSW community,
(g) the alignment, zoning and acquisition of land to support the proposed fuel pipeline corridor to Western Sydney Airport and surrounds, and,
(h) any other related matters.

2. That the Committee report by 30 November 2021.

Resolved, on the motion of Ms Sharpe: That the committee defer consideration of the terms of reference.

9. Adjournment

The committee adjourned at 2.10 pm, *sine die.*

Stewart Smith
Committee Clerk

Minutes no. 52
Tuesday 1 June 2021
Portfolio Committee No. 7 – Planning and Environment
Macquarie Room and via videoconference, 11.02 am

1. Members present

Ms Faehrmann, *Chair*
Mr Pearson, *Deputy Chair*
Mr Buttigieg
Ms Cusack (*via videoconference)*
Mr Franklin from 11.45
Mr Mallard until 12.45
Ms Sharpe

2. Inquiry into Waste Avoidance and Resource Recovery Amendment (Plastics Reduction) Bill 2021

Public hearing

Witnesses, the public and the media were admitted.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witnesses were sworn and examined:

- Dr Scott Wilson, AUSMAP Research Director and Senior Research Fellow, Macquarie University
- Ms Jane Coram, Director, Land and Water, CSIRO *(via videoconference)*
- Dr Deborah Lau, Ending Plastic Waste Mission Leader, Oceans and Atmosphere, CSIRO (*via videoconference*).

Dr Wilson tendered the following document:

- 'Raising Awareness of Microplastic Pollution' powerpoint slides.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Ms Rose Read, Chief Executive Officer, National Waste and Recycling Industry Council
- Ms Gayle Sloan, Chief Executive Officer, Waste Management and Resource Recovery Association Australia
- Mr Tony Khoury, Executive Director, Waste Contractors and Recyclers Association.

Mr Khoury tendered the following document:

- Speaking notes and tips for sustainable kerbside recycling outcomes.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Mr David Stout, Director, Policy, National Retail Association
- Mr Ian McAlister, Chief Executive Officer, Consumer Electronics Suppliers Association
- Mr Michael Rogers, Chief Executive Officer, Australian Fresh Produce Alliance (*via videoconference).*

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Mr Justin Koek, Director, Circular Economy and Markets, Department of Planning, Industry and Environment
- Ms Nancy Chang, Executive Director, Regulatory Policy Initiatives and Advice, Environment Protection Authority
- Ms Kathy Giunta, Director, Circular Economy Programs Branch, Environment Protection Authority.

The evidence concluded and the witnesses withdrew.

The public hearing concluded at 3.56 pm.

Tendered documents
Resolved on the motion of Ms Sharpe: That the committee accept and publish the following documents tendered during the public hearing:

- 'Raising Awareness of Microplastic Pollution' powerpoint slides, tendered by Dr Wilson
- Speaking notes and tips for sustainable kerbside recycling outcomes, tendered by Mr Khoury.

3. Inquiry into the health and wellbeing of kangaroos and other macropods

Public submissions
The committee noted that the following submissions were published by the committee clerk under the authorisation of the resolution appointing the committee: submissions nos 3, 4, 5, 5a, 7, 7a, 8-11, 13, 15, 17, 18, 19, 19a, 19b, 20, 21, 24, 25, 25a, 26-32, 34-44, 63, 65-67, 67a, 68-73, 75, 75a, 76-79, 102, 103, 105, 108, 113, 114, 116-118, 120-122, 126, 147-151, 153-155, 157-174, 176, 177, 179-234, 236-251, 253, 254, 256-261, 264, 268, 270, 273, 274, 280, 281, 288-291, 294, 295, 299, 300, 303, 304, 306, 308-310, 312, 314, 315, 317, 320, 321, 323, 324a, 325-327, 330, 331, 333, 335, 336, 341-343, 345, 346, 350, 351, 356-360, 363, 366, 367, 369, 370, 373-375, 377-379, 386-389, 394, 395 and 399-403.

The committee noted a revised version of submission 270 had been circulated.

Partially confidential submissions (name suppressed)
The committee noted that the following submissions were partially published by the committee clerk under the authorisation of the resolution appointing the committee: submissions nos 1, 2, 2a, 45-49, 51, 53-62, 64, 74, 80, 81, 83, 85-93, 93a, 94, 95, 95a, 97-101, 104, 107, 110, 112, 115, 124,125, 127-132, 134-136, 138-140, 143, 145, 146, 156, 175, 178, 262, 263, 269, 272, 276-279, 282-287, 297, 298, 302, 305, 307, 311, 316, 318, 319, 322, 328, 332, 334, 337, 338a, 338b, 339, 340, 344, 347-349, 353-355, 361, 362, 364, 365, 368, 371, 372, 380-385, 390-393 and 396-398.

Resolved, on the motion of Ms Sharpe: That the committee keep the following information confidential, as per the request of the author: names and/or identifying and sensitive information in submissions nos 1, 2, 2a, 45-49, 51, 53-62, 64, 74, 80, 81, 83, 85-93, 93a, 94, 95, 95a, 97-101, 104, 107, 110, 112, 115, 124,125, 127-132, 134-136, 138-140, 143, 145, 146, 156, 175, 178, 262, 263, 269, 272, 276-279, 282-287, 297, 298, 302, 305, 307, 311, 316, 318, 319, 322, 328, 332, 334, 337, 338a, 338b, 339, 340, 344, 347-349, 353-355, 361, 362, 364, 365, 368, 371, 372, 380-385, 390-393 and 396-398.

Partially confidential submissions (identifying and/or sensitive information)
The committee noted that the following submissions were partially published by the committee clerk under the authorisation of the resolution appointing the committee: 18a, 23, 52, 84, 109, 152, 252, 255, 265, 271, 313, 338, 324 and 384.

The committee noted that the authors of submissions nos 52, 84, 109, 313, 338 and 384 also requested their names be redacted.

Resolved, on the motion of Ms Sharpe: That the committee:

- keep the following information confidential, as per the recommendation of the secretariat: identifying and sensitive information in submissions nos 18a, 23, 52, 84, 109, 152, 252, 255, 265, 313, 338, 324 and 384; and
- keep the following information confidential, as per the request of the authors: names and identifying information in submission nos 52, 84, 109, 313, 338 and 384
- keep the following information confidential, as per the request of the author: identifying and sensitive information in submission 271.

Confidential submissions
Resolved, on the motion of Mr Pearson: That the committee keep submissions nos 6, 12, 14, 16, 22, 33, 50, 82, 96, 106, 111, 119, 123, 133, 137, 141, 142, 144, 235, 266, 267, 275, 292, 293, 296, 301, 329, 352, 376 and 404 confidential, as per the request of the author.

The Committee noted that at the request of the author, submission no. 270 had been updated and replaced.

4. Inquiry into Protection of the Environment Operations Amendment (Clean Air) Bill 2021
The Chair advised that Ms Boyd would be substituting for Ms Faerhmann, and Mr Martin would be substituting for Mr Franklin for the duration of the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.

The Chair noted that Mr Pearson would take the Chair for the duration of the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.

The committee discussed extending the reporting date to 10 September, noting that this would require a resolution of the House.

The committee noted the proposed dates for a public hearing on 19 July, and report deliberative on 1 September, and that the secretariat would canvass availability on those dates.

5. Adjournment
The committee adjourned at 4.05 pm, until Friday 11 June 2021.

Peta Leemen
Committee Clerk

Minutes no. 64
Friday 15 October 2021
Portfolio Committee No. 7 – Planning and Environment
Via videoconference, 9.16 am

1. Members present
Mr Pearson, *Chair*
Ms Boyd (*substituting for Ms Faehrmann*)
Ms Cusack, *Deputy Chair* (from 9.18 am until 3.10 pm)
Mr Franklin (*until 9.23 am*)
Ms Jackson (*from 9.23 am*)
Mr Mallard
Mr Martin (*substituting for Mr Franklin*)
Ms Sharpe (*from 9.15 am until 9.30 am and from 11.42 am*)
Mr Buttigieg (*substituting for Ms Sharpe from 9.30 am to 11.43 am*)

2. Apologies

Ms Faehrmann

3. Previous minutes

Resolved, on the motion of Ms Cusack: That draft minutes no. 63 be confirmed.

4. Correspondence

The committee noted the following items of correspondence:

Received

- 27 May 2021 – Letter from the Hon Natasha Maclaren-Jones MLC, Government Whip Legislative Council to secretariat, substitution of the Hon Ben Franklin MLC for the Hon Taylor Martin MLC for the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 1 June 2021 – Email from the Hon Cate Faehrmann MLC to secretariat, substitution of the Hon Cate Faehrmann MLC for Ms Abigail Boyd MLC for the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 30 June 2021 – Email from Mr Brad Smith, Campaigns Director, Nature Conservation Council of NSW, to secretariat, seeking an extension to make a submission to the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 5 July 2021 – Email from Ms Anna Hancock, Climate Change Strategy Principal, EnergyAustralia, to secretariat, declining invitation to attend the hearing for the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 6 July 2021 – Email from Ms Alison Cochrane, Executive Officer CEO's Office, NSW Environment Protection Authority, to secretariat, responding to invitation to attend the hearing for the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 19 July 2021 – Email from Vicki Callaway, General Manager, Clean Air Society of Australia and New Zealand, to secretariat, lodging late submission to the inquiry into inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 20 July 2021 – Email from Hon Penny Sharpe MC, to secretariat, lodging late submission from Mr Sean Ambrose to the inquiry into inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 23 July 2021 – Email from Dr Arthur Chesterfield-Evans, to secretariat, lodging late submission to the inquiry into inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.

Sent

- 30 June 2021 – Email to Mr Brad Smith, Campaigns Director, Nature Conservation Council of NSW, approving the request for an extension to make a submission to the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.

5. Inquiry into Budget Estimates 2021 – 2022 – supplementary hearings procedural resolutions

The committee noted the Budget Estimates supplementary hearings timetable for 2021-2022 agreed to by the House, with hearings commencing at 9.30 am and concluding by 5.30 pm, for Portfolio Committee No. 7:

Date	Portfolio	No. of possible witnesses in person
Tuesday 26 October 2021	Energy and Environment (Kean)	3
Thursday 28 October 2021	Planning and Public Spaces (Stokes)	3

Monday 1 November 2021	Local Government (Hancock)	3

5.1 Allocation of question time and total hearing time

The committee noted that under the Budget Estimates 2021-2022 resolution the below portfolios will be examined as follows:

- Energy and Environment – by Opposition and Crossbench members only, from 9.30 am to 11.00 am, and from 11.15 am to 12.45 pm, then from 2.00 pm to 3.30 pm, and from 3.45 pm to 5.15 pm, with 15 minutes reserved for Government questions at the end of each session, if required.
- Planning and Public Spaces – by Opposition and Crossbench members only, from 2.00 pm to 3.30 pm, and from 3.45 pm to 5.15 pm, with 15 minutes reserved for Government questions from 5.15 pm to 5.30 pm, if required.
- Local Government – by Opposition and Crossbench members only, from 2.00 pm to 3.30 pm, and from 3.45 pm to 5.15 pm, with 15 minutes reserved for Government questions from 5.15 pm to 5.30 pm, if required.

5.2 Witness requests

Resolved, on the motion of Ms Sharpe: That, in addition to the Minister, the committee invite the following witnesses:

PLANNING AND PUBLIC SPACES

Invited to appear from 2.00 pm until 5.30 pm in person with Minister
Ms Kiersten Fishburn, Secretary, Department of Planning, Industry and Environment
Ms Alex O'Mara, Group Deputy Secretary, Place, Design and Public Spaces, Department of Planning, Industry and Environment
Invited to appear from 2.00 pm until 5.30 pm via Webex
Mr Marcus Ray , Group Deputy Secretary, Planning and Assessment, Department of Planning, Industry and Environment
Mr John Brogden, Chief Executive Officer, Landcom
Mr Brett Whitworth, Deputy Secretary, Greater Sydney, Place and Infrastructure, Department of Planning, Industry and Environment
[Name unknown], Coordinator General, Planning Delivery Unit, Department of Planning, Industry and Environment
Professor Mary O'Kane AC, Chair, NSW Independent Planning Commission

LOCAL GOVERNMENT

Invited to appear from 2.00 pm until 5.30 pm in person with Minister
[Name unknown], Coordinator General, Planning, Delivery and Local Government, Department of Planning, Industry and Environment
Mr Bob Sendt, Local Government Boundaries Commission Chair
Invited to appear from 2.00 pm until 5.30 pm via Webex
Ms Sharon Molloy, Executive Director, Biodiversity and Conservation, Department of Planning, Industry and Environment
[Name unknown], Deputy Secretary, Legal Services, Department of Planning, Industry and Environment
Mr Dean Knudson, Deputy Secretary, Biodiversity and Conservation, Department of Planning, Industry and Environment

Ms Michelle Fletcher, Director, Marine, Coastal, Estuaries and Flood, Department of Planning, Industry and Environment
Ms Kiersten Fishburn, Secretary, Department of Planning, Industry and Environment
Mr Luke Walton, Executive Director, Local Government and Economic Policy, Department of Planning, Industry and Environment
Mr Allan Baptist, Local Government Grants Commission Chair
Ms Gabrielle Pietrini, Director Marine Coastal Estuary and Flood Branch, EES, Department of Planning, Industry and Environment
Mr James Hebron, General Counsel, Governance and Legal, Department of Planning, Industry and Environment
Ms Sharon Molloy, Acting Deputy Secretary, Biodiversity and Conservation Directorate, Department of Planning, Industry and Environment
Mr Derek Rutherford, Acting Executive Director, Biodiversity and Conservation Division, EES, DPIE

ENERGY AND ENVIRONMENT

Invited to appear from 9.30 am until 5.30 pm in person (with Minister 9.30 am – 1.00pm)
Ms Kiersten Fishburn, Secretary, Department of Planning, Industry and Environment
Mr Atticus Fleming, Deputy Secretary, National Parks and Wildlife Service, Department of Planning, Industry and Environment
Invited to appear from 9.30 am until 5.30 pm via Webex
Ms Tracy Mackey, Chief Executive Officer, NSW Environment Protection Authority
Mr James Hay, Deputy Secretary, Energy, Climate Change and Sustainability and Chief Executive Officer of Energy Corporation of NSW, Department of Planning, Industry and Environment
Ms Nancy Chang, Executive Director, Regulatory Policy Initiatives and Advice, NSW Environment Protection Authority
Mr Dean Knudson, Deputy Secretary, Biodiversity, Conservation and Science, Department of Planning, Industry and Environment
Ms Sharon Molloy, Executive Director, Biodiversity and Conservation Division, Department of Planning, Industry and Environment
Dr Kate Wilson, Executive Director, Climate Change and Sustainability, Department of Planning, Industry and Environment
Dr Paul Grimes, Coordinator-General, Environment, Energy and Science, Department of Planning, Industry and Environment
Mr John Cleland, Chief Executive Officer, Essential Energy
Ms Michelle Dumazel, Executive Director, Biodiversity and Conservation Division, Department of Planning, Industry and Environment
Mr Andrew Lewis, Executive Director, Energy, Department of Planning, Industry and Environment

Resolved, on the motion of Ms Sharpe: That:

- the list of witnesses suggested by the Opposition be circulated to the committee for comment
- the committee provide witness requests to the secretariat by 10 am, Monday 18 October 2021.

Resolved, on the motion of Ms Sharpe: That the committee not invite parliamentary secretaries to appear as a witness at the hearings.

5.3 Witness appearance time

Resolved, on the motion of Ms Sharpe: That:

- the Minister appear from 9.30 am until 1.00 pm for full day and half day morning hearings, with departmental staff to appear for the duration of the hearing
- the Minister appear from 2.00 pm until 5.30 pm for half day afternoon hearings, with departmental staff to appear for the duration of the hearing.

6. Protection of the Environment Operations Amendment (Clean Air) Bill 2021

6.1 Material from Mr Sean Ambrose

Resolved, on the motion of Ms Cusack: That

- That the committee accept the material from Mr Ambrose as correspondence.
- That the committee keep the correspondence from Mr Ambrose regarding the Clean Air Bill inquiry, dated 20 July 2021, confidential, as per the recommendation of the secretariat, as it contains potential adverse mention.

6.2 Public submissions

The committee noted the following submissions were published by the committee clerk under the authorisation of the resolution appointing the committee: submission nos. 1-4, 6-13, 15-31.

6.3 Partially confidential submissions

Name suppressed

Resolved, on the motion of Ms Cusack: That the committee keep the name of the author confidential, as per the request of the author in submission nos. 5 and 14.

Partially confidential submission no. 32

Resolved, on the motion of Ms Cusack: That the committee authorise the publication of submission no. 32, with the exception of identifying and/or sensitive information which are to remain confidential, as per the recommendation of the secretariat.

6.4 Revised inquiry timeline

Postponement and rescheduling of hearing

The committee noted that it was resolved via email on 13 July 2021 to postpone the hearing planned for 19 July 2021 given the escalating COVID-19 situation in Sydney. The committee resolved via email on 17 August 2021 to reschedule the hearing for 15 October 2021.

Extension of reporting date

The committee noted that:

- on 9 June 2021 the House resolved to extend the reporting date to 10 September 2021
- it is anticipated the House will resolve during the sitting week commencing 12 October 2021 to extend the reporting date to 18 November 2021.

6.5 Transcript corrections, answers to questions on notice and supplementary questions

Resolved, on the motion of Ms Cusack:

- That witnesses be requested to return transcript corrections and answers to questions on notice within seven days of the date on which questions are forwarded to the witness.
- That there be no supplementary questions from members.

6.6 Live streaming and recording of hearing

Resolved, on the motion of Ms Cusack: That the hearing on 15 October 2021 be recorded and the recording be uploaded on the NSW Parliament's YouTube page and a link be published on the inquiry webpage as soon as practicable after the hearing subject to any comments or concerns from the secretariat or the committee after the hearing.

6.7 Allocation of questioning

Resolved, on the motion of Ms Cusack: The allocation of questions to be asked at the hearing on 15 October 2021 is to be determined by the Chair.

6.8 Deputy Chair for hearing on 27 September

The Chair called for nominations for election of Deputy Chair for the duration of the hearing on 15 October 2021.

Mr Mallard moved: That Ms Cusack be elected Deputy Chair for the duration of the public hearing on 15 October 2021.

There being no further nominations, the Chair declared Ms Cusack elected Deputy Chair.

6.9 Virtual public hearing

The committee proceeded to take evidence in public at 9.35 am.

Witnesses were admitted via video link.

The Chair made an opening statement regarding the broadcasting of proceedings and other matters.

The following witnesses were sworn and examined:

- Mr Will Belford, Spokesperson, Future Sooner
- Mr Jonathan Moylan, NSW Clear Air Campaigner, Healthy Futures
- Mr Michael Campbell OAM, Executive Member, Community Environment Network (Central Coast)

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Mr Nick Witherow, Principal Lawyer, Environmental Justice Australia
- Ms Rachael Chick, Solicitor, Environmental Defenders Office
- Dr Brad Smith, Campaigns Director, Nature Conservation Council of NSW

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Dr Ben Ewald, Convenor, Air Pollution Special Interest Group, Doctors for the Environment Australia
- Dr Christine Cowie, Affiliate, Centre for Air Pollution, Energy and Health Research

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Mr Greg Jarvis, Executive General Manager, Energy Supply and Operation Origin Energy
- Mr Steven Rigby, General manager, Asset Manager and Development, Origin Energy
- Mr Greg Everett, Chief Executive, Delta Electricity
- Mr Justin Flood, Executive Manager, Sustainability, Delta Electricity

Mr Flood tendered the following documents:

- A review by Hugh Malfroy, Director of Malfroy Environmental Strategies Pty Ltd, of the briefing note by Dr Ewald, January 2021, titled 'Power station NO2 emissions and paediatric asthma in Central Coast, Hunter Valley and Sydney Local Government Areas'.
- Position Statement of Australian Energy Council on the EnRiskS Report, and the EnRisks peer review report on the report by Dr Ben Ewald, titled ' The health burden of fine particle pollution from electricity generation in NSW'.

The evidence concluded and the witnesses withdrew.

The following witnesses were sworn and examined:

- Ms Sarah Balmanno, Manager Strategic Policy and Programs, Climate Change an Sustainability Division, Energy, Environment and Science Group, Department of Planning, Industry and Environment
- Dr Richard Broome, Acting Executive Director, Health Protection NSW, NSW Health

The hearing concluded at 3.19 pm.

The public and media withdrew.

6.10 Tendered documents

Resolved, on the motion of Mr Martin: That the committee accept and publish the following documents tendered during the public hearing:

- Mr Justin Flood, Delta Electricity – A review by Hugh Malfroy, Director of Malfroy Environmental Strategies Pty Ltd, of the briefing note by Dr Ewald, January 2021, titled 'Power station NO2 emissions and paediatric asthma in Central Coast, Hunter Valley and Sydney Local Government Areas'.
- Mr Justin Flood, Delta Electricity – Position Statement of Australian Energy Council on the EnRiskS Report, and the EnRisks peer review report on the report by Dr Ben Ewald, titled ' The health burden of fine particle pollution from electricity generation in NSW'.

6.11 Report deliberative

Resolved, on the motion of Ms Cusack: That the committee meet at 10.00 am to consider the Chair's draft report on Monday 15 November 2021.

6.12 Right of reply – Dr Ben Ewald

Resolved, on the motion of Mr Martin: That the committee invite a right of reply from Dr Ben Ewald to the evidence from Mr Greg Everett, Chief Executive at Delta Electricity, at the public hearing on 15 October 2021.

7. Adjournment

8. Next meeting

Friday 22 October 2021, 9.15 am, via WebEx (Biodiversity Offset Scheme hearing).

Emily Treeby
Committee Clerk

Draft minutes no. 69
Monday 15 November 2021
Portfolio Committee No. 7 – Planning and Environment
Via videoconference and room 1043, Parliament House, Sydney at 9.07 am

1. Members present
Mr Pearson, A/Chair
Ms Boyd
Ms Cusack
Mr Mallard
Ms Sharpe

2. Apologies
Ms Jackson
Mr Martin

3. Previous minutes
Resolved, on the motion of Ms Sharpe: That draft minutes no. 65 be confirmed.

4. Correspondence
The committee noted the following items of correspondence:

Received

- 18 October 2021 – Email from Mr Rhys Thomas, Policy Advisor, Australian Energy Council, to secretariat, information relating to the inquiry into Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 21 October 2021 – Letter from Mr Greg Everett, Chief Executive, Delta Electricity, to committee, Additional information relating to the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 28 October 2021 – Letter from Dr Bed Ewald, Convenor, Air Pollution Special Interest Group, Doctors for the Environment Australia, responding to letter from the Acting Chair of Portfolio Committee No. 7 – Planning and Environment, the Hon Mark Pearson MLC, regarding a right to reply to evidence in the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.
- 5 November 2021 – Correspondence from Dr Christine Cowie, Centre for Air Pollution, Energy and Health Research – Article by Dr Richard Broome et al, 'The mortality effect of PM2.5 sources in the Greater Metropolitan Region of Sydney, Australia' (2020).
- 5 November 2021 – Correspondence from Dr Christine Cowie, Centre for Air Pollution, Energy and Health Research – Article by Ivan Hanigan et al, 'Avoidable Mortality Attributable to Anthropogenic Fine Particulate Matter (PM2.5) in Australia' (2021).

Sent

- 22 October 2021 – Letter to Dr Bed Ewald, Convenor, Air Pollution Special Interest Group, Doctors for the Environment Australia, from the Acting Chair of Portfolio Committee No. 7 – Planning and Environment, the Hon Mark Pearson MLC, regarding a right to reply to evidence in the inquiry into the Protection of the Environment Operations Amendment (Clean Air) Bill 2021.

5. Inquiry into Protection of the Environment Operations Amendment (Clean Air) Bill 2021

5.1 Public submissions

The committee noted that submission no. 33 was published by the committee clerk under the authorisation of the resolution appointing the committee.

5.2 Transcript from hearing on 15 October 2021

The committee noted that on 25 October 2021 it was resolved via email that the transcript of the hearing on 15 October 2021, which had not been reviewed by a subeditor, was to be sent to witnesses for corrections and answers to questions on notice and is the official transcript of the hearing.

5.3 Answers to questions on notice

The committee noted that the following answers to questions on notice were published by the committee clerk under the authorisation of the resolution appointing the committee:

- answers to questions on notice from Mr Will Belford, Spokesperson, Future Sooner, received 15 October 2021.
- answers to questions on notice from Ms Sarah Balmanno, Manager Policy, Climate Change and Sustainability Division, Energy, Environment and Science Group, Department of Planning, Industry and Environment, received 29 October 2021.
- answers to questions on notice from Mr Jonathan Moylan, NSW Clean Air Campaigner, Healthy Futures, received 1 November 2021.
- answers to questions on notice from Mr Greg Jarvis, Executive General Manager, Energy Supply and Operation, Origin Energy, received 2 November 2021.

5.4 Consideration of the Chair's Draft Report

The A/Chair submitted his draft report entitled Protection of the Environment Operations Amendment (Clean Air) Bill 2021, which, having been previously circulated, was taken as being read.

Resolved, on the motion of Ms Boyd: That:

The draft report be the report of the committee and that the committee present the report to the House;

The transcripts of evidence, submissions, tabled documents, answers to questions on notice, and correspondence relating to the inquiry be tabled in the House with the report;

Upon tabling, all unpublished attachments to submissions be kept confidential by the committee;

Upon tabling, all unpublished transcripts of evidence, submissions, tabled documents, answers to questions on notice, and correspondence relating to the inquiry, be published by the committee, except for those documents kept confidential by resolution of the committee;

The committee secretariat correct any typographical, grammatical and formatting errors prior to tabling;

The committee secretariat be authorised to update any committee comments where necessary to reflect changes to recommendations or new recommendations resolved by the committee;

Dissenting statements be provided to the secretariat within 24 hours after receipt of the draft minutes of the meeting;

The report to be tabled by 18 November 2021;

The Chair to advise the secretariat and members if they intend to hold a press conference, and if so, the date and time.

6. Adjournment

The committee adjourned at 9.10 am, until Thursday 9 December 2021, 1.00pm, Jubilee Room, Parliament House (TBC) (Biodiversity Offsets Scheme public hearing).

Emily Treeby
Committee Clerk