CLIMATE AND HEALTH ALLIANCE

Submission to in response to the Draft NSW Clean Air Strategy

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About the Climate and Health Alliance

The Climate and Health Alliance (CAHA) is a national charity and the peak body on climate change and health in Australia. CAHA and its members work together to raise awareness about the health risks of climate change and the health benefits of emissions reductions and adaptation.

The membership of CAHA includes a broad cross-section of health sector stakeholders with 50 member organisations, representing healthcare professionals from a range of disciplines, as well as healthcare service providers, institutions, academics, researchers, and consumers. Information about CAHA's membership and governance in Appendix 2.

CAHA is a member of the Global Climate and Health Alliance, a member of the World Health Organization Working Group to Advance Action on Health and Climate Change, and a strategic partner of the international NGO, Health Care Without Harm.

The Climate and Health Alliance has produced a significant number of reports and publications to assist policymakers and health stakeholders and the wider community understand the links between climate change and health, and to support evidence-based decisions regarding policy and solutions.

These include the *Human Health and Wellbeing Adaptation Plan for Queensland*; the *Framework for a National Strategy on Climate, Health and Well-being for Australia*; a *Review of Health and Climate Change Literature* for the City of Melbourne; a joint report on divestment from fossil fuels, *Healthy Investments*, with Doctors for the Environment, Australia; the seminal report *Coal and Health in the Hunter: Lessons from One Valley for the World*; a multi-stakeholder *Joint Position Statement and Background Paper on Health and Energy Choices*; a joint report '*Our Uncashed Dividend*' (with The Climate Institute) on the health benefits of reducing greenhouse gas emissions; and *Background Briefing Paper* on the Health Implications of Energy Policy.

CAHA has produced a film on the risks to health and climate from coal and gas, *The Human Cost of Power*; and has conducted many innovative and groundbreaking public events, including (since 2021) a annual series of Greening the Healthcare Sector Forums, including several Healthcare Environmental Sustainability Forums with Western Health and Institute for Hospital Engineers Australia; the Our Climate Our Health Seminar, featuring an innovative thought experiment: Imagining 2030 as a healthy low carbon world; a Public Seminar on Protecting Health from Climate Change (with University of NSW); and a national Forum on Climate and Health: Research, Policy and Advocacy.

For further information see www.caha.org.au and Appendix A, below.

Introduction

The health impacts of air pollution have been well documented. The World Health Organization classified air pollution as an important determinant of health and stated that there is no evidence of a safe level of exposure or a threshold (for particulate matter) below which no adverse health effects occur.[1]

Health effects documented as results of particulate matter (PM) inhalation include respiratory and cardiovascular morbidity, such as asthma, respiratory symptoms and increased hospital admissions, and mortality from cardiovascular and respiratory diseases and from lung cancer. [2]

The work to develop a Clean Air Strategy for NSW is welcome and necessary. While previous studies mostly referred to global and international data documenting the impact of air pollution on health, more recent studies include data for Australia and New South Wales. The data indicates that urgent action is required.

The Climate and Health Alliance welcomes the opportunity to provide input to this process.

Our submission contains three parts:

1) evidence and data on the impacts of air pollution on health in Australia,

2) assessment of New South Wales' air pollution monitoring systems

3) summary assessment of New South Wales' sources of air pollution

4) recommendations to improve air quality and air quality monitoring.

[1] World Health Organisation. Regional Office for Europe (2014), Health Effects of Particulate Matter: Policy Implication for countries in eastern Europe, Caucasus and central Asia.
[2] Ibid.

1. Evidence and Data on Impacts of Air Pollution on Health

1.1. Sources of air pollution

Common components of air pollution in Australia include: nitrogen dioxide, sulfur dioxide, ground level ozone, and particulates.

Nitrogen dioxide is found in emissions from vehicles, coal-fired power stations and industrial processes. It can irritate eyes, nose, throat and lungs, causes coughing, shortness of breath. Exposure causes illness and disease, impacting a wide range of organs including the lungs, heart and circulatory system.

The majority of sulfur dioxide emissions in Australia come from coal-fired power generation. Exposure to sulfur dioxide can damage the lungs. People with impaired heart or lung function including asthma are at increased risk. Sulfur dioxide is implicated in some cardiovascular and respiratory diseases, including cancer.

Ground level ozone is a gas that is formed in the presence of sunshine and volatile organic compounds produced from burning fossil fuels. Ozone can increase susceptibility to lung infections and aggravate lung diseases such as asthma, chronic obstructive pulmonary disease, and chronic bronchitis.

Particulates (PM2.5 and PM10) arise from vehicle exhaust, including diesel trucks and trains, woodsmoke, coal dust, coal combustion, and bushfires. Exposure is associated with respiratory and cardiovascular diseases and cancer. Epidemiological research reveals there is no threshold at which adverse health impacts of particulate pollution do not occur.[3]

Coal-fired power stations and motor vehicles are the main sources of sulfur dioxide and nitrogen dioxide respectively, in Australia. Diesel powered vehicles emit a much higher amount of nitrogen, compared to petrol vehicles.[4]

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[3] Brunkreef B and Forsberg B, 2005, Epidemiological evidence of effects of coarse airborne particles on health, European Respiratory Journal, 26, pp.309-318.

[4] Expert Position Statement on health-based standards for Australian regulated thresholds of nitrogen dioxide, sulfur dioxide and ozone in ambient air. Available at: https://d3n8a8pro7vhmx.cloudfront.net/caha/pages/36/attachments/original/1566475401/NOXSO2O3_Expert_Position_Statement_FINAL.pdf?1566475401

1.2 Premature deaths

Recent peer-reviewed studies on air pollution impacts in Australia[5] put the number of premature deaths from air pollution in Australia per annum at between 2,616 and 4,884 at an estimated economic cost of up to AUD $24 billion per year. A global study published in March 2021, co-authored by Harvard scientists, found that air pollution generated by fossil fuel combustion was responsible for more than 8 million premature deaths in 2018, or around 1 in 5 deaths each year from all causes, a figure significantly higher than suggested by previous research.[6]

1.3 Low birth weight and asthma in children

In Australia, air pollution from coal-fired power has been associated with low birth weight in 845 babies and 14,434 children with asthma annually.[7]

1.4 Deaths and health impacts from bushfire related air pollution

According to research published in the *Medical Journal of Australia*, the bushfires of the 2019-2020 summer period resulted in 417 deaths from exposure to air pollution during the fires, and led to 1,305 asthma emergency department presentations, and 3,151 hospital admissions for cardiovascular and respiratory conditions.[8] The long-term health impacts from these fires are yet to be quantified, but will very likely contribute to new and worsening chronic respiratory illnesses.

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[5] Hanigan, I.C.; Broome, R.A.; Chaston, T.B.; et al. Avoidable Mortality Attributable to Anthropogenic FineParticulate Matter (PM2.5) in Australia. *Int. J. Environ. Res. Public Health* 2021, 18; 254. https://doi.org/10.3390/ijerph18010254; Australian Institute of Health and Welfare(AIHW) (2016). Australian burden of disease study: impact and causes of illness and death in Australia 2011, AIHW, Canberra; Begg, S. (2007). The burden of disease and injury in Australia 2003, PHE 82, AIHW, Canberra; Institute for Health Metrics and Evaluation (IHME). Global Burden of Disease Study 2017. Seattle, WA: IHME, University of Washington,2017. http://vizhub.healthdata.org/gbd-compare.

[6] Vohra K. , Vodonos, A. , Schwartz, J., , et al. Global mortality from outdoor fine particle pollution generated by fossil fuel combustion: Results from GEOS-Chem, *Environmental Research*, 2021, 195.

[7] Farrow, A., Anhaeser A., Myllyvirta L., Lethal Power: How Burning Coal is Killing People in Australia, August 2020, ,pp 22-24. Available at https://www.greenpeace.org.au/wp/wp-content/uploads/2020/08/GPAP-Lethal-Power-full-report.pdf

[8] Borchers Arriagada N., Palmer, A., Bowman D., et al. , Unprecedented smoke-related health burden associated with the 2019-20 bushfires in eastern Australia, *Medical Journal ofAustralia*, 12 March 2020.
Available at: https://onlinelibrary.wiley.com/doi/pdf/10.5694/mja2.50545

1.5 Economic costs of air pollution in Australia

The health cost from coal-fired power generated air pollution was estimated at $2.4 billion annually in 2009. Air pollution related mortality costs the Australian public an estimated $16 billion per year.[9]

2. Assessment of air pollution monitoring systems in New South Wales

2..1. Inconsistent air pollution monitoring and disclosure

The New South Wales air pollution monitoring system is somewhat advanced over that of other states. The requirement for the disclosure of monthly monitoring reports by NSW power stations is welcome, as is the real-time air pollution information from the Office of Environment and Heritage. It would be consistent to ensure that the monitoring data from the NSW power stations is also aggregated onto a single website of the Environment Protection Agency.

2.2. Lack of road-side air pollution monitoring

The absence of monitoring of road-side air pollution in inner-city Sydney presents a gap in NSW's air pollution monitoring. Recent research[10] has documented high levels of PM 2.5 pollution at key intersections in Western Sydney. This research relied on pollution sensors installed by the researchers as government monitors are unable to consistently track location-specific road-side air pollution. Given the health threats from road-side air pollution, it is vital for council governments to have accurate pollution data, in order to put in place mitigation and protection measures.

[9] Health Effects Institute (2017), 'State of Global Air 2017' (online database), www.stateofglobalair.org. (Accessed 07/05/2018) Ambient PM + Ozone mortality: Australia – 3099 deaths (2015 global burden of disease x $A5.2M the 2010 value of statistical life).
[10] Forehead H, Barthelemy J, Arshad B, Verstaevel N, Price O, Perez P (2020) Traffic exhaust to wildfires: PM2.5 measurements with fixed and portable, low-cost LoRaWAN-connected sensors. PLoS ONE 15(4): e0231778.

3. Summary assessment of sources of air pollution in New South Wales

According to New South Wales' most recent Air Emissions Inventory (2013) [11], generation of electrical power from coal is the highest source of NOx and SO2 in the greater metropolitan region (GMR). Bushfires and prescribed burning are the highest contributors to PM 10 and PM 2.5 pollution.

While coal-fired power stations are not the biggest source of direct PM2.5 pollution, since both SO2 and NOx form secondary PM2.5 pollution, coal-fired power stations are a significant contributor to PM2.5 pollution in the GMR. For example, power station SO2 produces close to 20 percent of PM2.5 at Richmond in Sydney's north-west on an annual basis. Overall, the coal industry in NSW, whether burning coal to generate electricity or coal mining, is the largest industrial contributor to NSW's air pollution. This conclusion is largely supported by industry self-reporting in the most recent NPI data.

[11] https://www.epa.nsw.gov.au/your-environment/air/air-emissions-inventory/air-emissions-inventory-2013

4. Recommendations

3.1. Reduce air pollution from coal-fired power stations

Put in place a **publicly available monitoring and mitigation plan for air pollution from coal-fired power stations by September 2021**. This system should include the following:

- Best available pollution control technologies (BACT) short and medium-term emissions limits for PM_{10}, $PM_{2.5}$, SO_2, NO_x, and Hg.
- Continuous emission monitoring (CEMS) for CO_2, $PM_{2.5}$, SO_2, NO_x, and Hg, to be installed, maintained and operated, with real-time posting on a publicly available website.
- A requirement that CEMS be maintained and operated in accordance with international best practices, including annual relative accuracy test audits and quarterly relative accuracy audits.
- A maintenance plan, with specified replacement of parts at intervals based conservatively on prior maintenance history and on-site storage of critical components affecting emissions (such as filter bags, SO2 and NOx reagents).
- An immediate reduction in generation to the lowest level necessary to maintain grid stability and initiation of shutdown procedures for any malfunction that cannot be resolved within a specified period of time.
- The use of the cleanest available fuels during any period where a pollution control is not operational (e.g., before the unit reaches the operating temperature needed by its selective catalytic reduction (SCR)).
- Immediate reporting of any upset conditions to the agency and the public. The EPA should investigate and post the results of its review.
- Shutdown of the unit if monitoring device availability falls below acceptable levels.
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3.2 Reduce urban pollution from transport

Reducing the health consequences of transport pollution requires reduction of overall traffic emissions. This can be achieved through measures to:

- strengthen vehicle emissions standards;
- reduce the amount of vehicles on the road;
- discourage purchase and use of diesel vehicles;
- increase the proportion of low or zero emission vehicles;
- reconfigure cities and towns to allow most daily commuting to occur by walking, cycling, and via public transport; and

- set ambitious targets for urban greening to create cooler microclimates and improve air quality in urban areas.

3.3. Improve air pollution monitoring data and access to information

Develop an air quality monitoring plan **by September 2021 that increases the level of, and access to, air quality monitoring and information**. This plan should include the following:

- Installing and/or increasing permanent air quality monitoring stations in every community that is near a major industrial source of pollution, such as coal-fired power stations, with new monitors at Lake Macquarie and Lithgow.
- Implementing localised monitoring networks in areas with large traffic flow and with high wood-burning heater usage, including the use of low-cost monitors.
- Ensuring access to monitoring data be made available in real-time, on a single website maintained by the EPA.
- Funding and implementing an *AirSmart* health promotion campaign to minimise the health impacts of poor air quality.

APPENDIX A

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Australian Psychological Society (APS)
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CRANAplus
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Motion Energy Group
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NSW Nurses and Midwives' Association (NSWNMA)

Pharmacists for the Environment Australia (PEA)
Public Health Association of Australia (PHAA)
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