



CLIMATE^{AND}
HEALTH
ALLIANCE

**Submission on the proposed variation to
the ambient air quality measure standards
for ozone (O₃), nitrogen dioxide (NO₂) and
sulfur dioxide (SO₂)**

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About the Climate and Health Alliance

The Climate and Health Alliance (CAHA) is the national peak body in Australia working at the intersection of climate change and health. CAHA works to catalyse action on climate change through building a powerful health sector movement, nationally and internationally.

There are over 30 organisations / institutions that are members of CAHA. Members come from a broad cross section of the health sector, and represent hundreds of thousands of health professionals from a range of disciplines (nursing, midwifery, public health, physicians, medicine, psychology, social work, rural and remote health, health promotion), as well as healthcare service providers, institutions, academics, researchers, and health consumers.

CAHA's members recognise that healthcare stakeholders have a particular responsibility to the community in advocating for public policy that will promote and protect human health.

CAHA has produced a significant number of reports and publications to assist policymakers and to inform health stakeholders and the wider community. These include the National Strategy on Climate, Health and Well-being for Australia in 2017; the preceding Discussion Paper in 2016; the joint report Healthy Investments (with Doctors for the Environment) in 2016; the seminal report Coal and Health in the Hunter: Lessons from One Valley for the World in 2015; the multi-stakeholder Joint Position Statement and Background Paper on Health and Energy Choices in 2014; the joint report 'Our Uncashed Dividend' (with The Climate Institute) in 2012 on the health benefits of reducing greenhouse gas emissions. CAHA conducted a national Roundtable on the Health Implications of Energy Policy in 2013 and prepared a Briefing Paper on the same topic.

CAHA's 2013 film the Human Cost of Power highlights the risks to health and climate from coal and gas. CAHA has conducted many innovative public events, including the Healthcare Environmental Sustainability Forum (with Western Health and Institute for Hospital Engineers Australia) in 2017 and 2016; Greening the Healthcare Sector Think Tanks with the Our Climate Our Health Seminar in 2015, featuring an innovative thought experiment: Imagining 2030 as a healthy low carbon world; a Public Seminar on Protecting Health from Climate Change in 2014 (jointly hosted with University of NSW); and the national Forum on Climate and Health: Research, Policy and Advocacy in 2013. CAHA also contributes to many conferences, community dialogues, and forums, both nationally and internationally, including the UNFCCC Conferences, on these issues.

For more information about the membership and governance of the Climate and Health Alliance (CAHA), please see Appendix A. For further information about the organisation and CAHA activities, see: www.caha.org.au

Introduction

Air quality is a fundamental determinant of human health. Australia, along with other nations, faces pressures on its air quality monitoring, standards and management in increasingly environmentally challenged times both globally and locally. As air quality declines, the risk of stroke, heart disease, lung cancer, and chronic and acute respiratory diseases, including asthma, increases¹. In Australia, ambient air pollution contributes to over 3000 premature deaths per year, and even at relatively low levels sulfur dioxide (SO₂), nitrogen dioxide (NO₂) and ozone (O₃) are harming the health of Australians now. Recent Australian studies have demonstrated statistically significant health impacts at pollutant concentrations below NEPM thresholds.^{2,3}

The current Australian ambient air standards are failing to adequately protect human health and wellbeing. The weight of new scientific evidence available since the NEPM's initiation should guide this revision.

The Climate and Health Alliance welcomes the opportunity to present this submission to the NEPC on the proposed variation to the ambient air quality measure standards for ozone (O₃), NO₂ and SO₂.

Our recommendations are based on:

- The impact statement for the review of the Ambient Air Quality NEPM standards for SO₂, NO₂ and O₃
- Review of recent air quality research
- Assessment of international best practice in terms of Ambient Air Quality Standards for NO₂, SO₂ and O₃
- Participation in an expert workshop, and expert health and medical advice from researchers and practitioners in the Lung Health Research Centre (Prof Gary Anderson); Doctors for the Environment Australia; Royal Australasian College of Physicians; Lung Foundation of Australia; Lung Health Research Centre; Climate and Health Alliance; Melbourne Energy Institute, Clean Air and Urban Landscapes Hub;

¹ Moore E, Chatzidiakou L, Kuku MO, Jones RL, Smeeth L, Beevers S, *et al.* (2016). Global associations between air pollutants and chronic obstructive pulmonary disease hospitalizations. A systematic review. *Ann Am Thorac Soc* 13, 1814–1827.

² Knibbs, Cortés de Waterman, Toelle, Guo, Denison, Jalaludin, Williams. (2018). The Australian Child Health and Air Pollution Study (ACHAPS): A national population-based cross-sectional study of long-term exposure to outdoor air pollution, asthma, and lung function. *Environment International*, 120, 394-403.

³ Bowatte, G., Lodge, C., Knibbs, L., Erbas, B., Perret, J., Jalaludin, B., Dharmage, S. (2018). Traffic related air pollution and development and persistence of asthma and low lung function. *Environment International*, 113, 170-176.

University of Melbourne, Melbourne Sustainable Society Institute; Royal Melbourne Hospital and the Peter MacCallum Cancer Centre (Prof Louis Irving); and Environmental Justice Australia

- Previous evidence-based CAHA reports including [Coal and Health in the Hunter: Lessons from One Valley for the World](#) 2015; the multi-stakeholder [Joint Position Statement and Background Paper on Health and Energy Choices](#) (2014); '[Our Uncashed Dividend](#)' (CAHA & The Climate Institute 2012) on the health benefits of reducing greenhouse gas emissions; and the [Briefing Paper](#) on the [Roundtable on the Health Implications of Energy Policy](#).

Health and climate co-benefits of improving air quality

In Australia, coal-fired power stations and motor vehicles are the main sources of sulfur dioxide and nitrogen dioxide respectively. Studies indicate that climate change and increasing temperatures further impact air quality to the detriment of human health.⁴ Reducing these emissions sources by either retrofitting pollution control technologies in power stations and vehicles, or better still, replacement with affordable, low emissions technologies multiplies both health and climate benefits.

Immediate, direct, local health and environmental benefits flow to affected communities of reducing combustion of coal, oil and gas.

Reducing the associated CO₂ and other greenhouse emissions also provides climate benefits in line with Australia's Paris commitments. This will help protect health and society's institutions and settlements against worsening climate disruption.

Our economy will also benefit from better air quality standards: it pays to count health costs and benefits

Air pollution related mortality costs the Australian public an estimated \$16 billion per year.⁵ International studies estimate that benefit to cost ratios of air quality improvement are extremely favourable, e.g. benefits of the US Clean Air Act for 1970 – 1990 were valued at \$US 22.2 trillion (health related economic benefits) compared to the implementation costs of \$US 0.52

⁴ Jacob D J and Winner D A 2009 Effect of climate change on air quality *Atmos. Environ.* 43 51–63

⁵ Health Effects Institute (2017), 'State of Global Air 2017' (online database), www.stateofglobalair.org. (Accessed 07/05/2018)

trillion.⁶ In the UK, a study over four decades from 1970-2010, demonstrated that effective pollution control policies can bring substantial public health benefits.⁷

Recommendations

CAHA contributed to the development of, and supports the recommendations detailed in the statement produced by an expert (health) roundtable “Expert Position Statement on health-based standards for Australian regulated thresholds of nitrogen dioxide, sulfur dioxide and ozone in ambient air” (June 2019).⁸

In summary, CAHA makes the following recommendations:

1. Lower the thresholds for nitrogen dioxide, sulfur dioxide, and ozone.

- In particular, CAHA recommends the sulfur dioxide 24-hour threshold should be reduced to 8ppb in line with WHO guidelines, and the nitrogen dioxide annual exceedance limit to 9ppb, in line with modern scientific evidence. Additionally, CAHA recommends the ozone 1-hour threshold be reduced to 70ppb and an 8-hour threshold to be introduced at 47ppb in line with World Health Organization recommendations. Such thresholds would protect the health of all people, wherever they live. In particular, these standards would reduce childhood asthma incidence and the adverse impact on childhood development and help incentivise the transition to clean renewable energy technologies. (More detailed recommendations are included in the Expert Position Statement to which CAHA contributed, attached to this submission.)

2. Expand the network of NEPM compliance monitors to reflect particular risks from widespread source emissions and hotspots.

- To accurately reflect population exposure, the network of NEPM compliance monitors should be expanded to more effectively evaluate the exposure of vulnerable groups and populations living near major sources of air pollution. This includes urban roadside locations where people live, work and learn, including schools and

⁶ Giannadaki et al. Implementing the US air quality standard for PM_{2.5} worldwide...*Environ Health* (2016) 15:88

⁷ Carnell E., Vieno M., Vardoulakis S., Beck R., Heaviside C., Tomlinson S., Dragosits U., Heal, M., Reis S., (2019). Modelling public health improvements as a result of air pollution control policies in the UK over four decades – 1970 to 2010. *Environmental Research Letters* 14, 074001.

⁸ Walter C et al June 2019 Expert Position Statement on health-based standards for Australian regulated thresholds of nitrogen dioxide, sulfur dioxide and ozone in ambient air.

childcare centres as traffic-related nitrogen dioxide is strongly associated with childhood asthma.

- 3. Make air quality monitoring data publicly available through a coordinated national website allowing access to real-time and historical data.**
 - This should include health alerts for the general public and at-risk population sub-groups e.g. those living or working close to major point sources, such as coal-fired power stations and major roadways.
- 4. Include compliance obligations and enforcement mechanisms in revised air quality standards and establish incentives and penalties that create a sufficient deterrent to prevent non-compliance.**
 - There should be a limited time frame in which industries responsible for emissions of nitrogen dioxide, sulfur dioxide and ozone ensure that their practices and emissions meet best practice, beyond which penalties are instituted.
- 5. Set strong health-based standards now to protect health, with an exposure reduction framework in place for continual improvement of the standard.**
 - Many studies have demonstrated statistically significant health impacts from exposure to pollutants at levels well below the proposed standards. (See the “Expert Statement” for further detail.)
 - Assessment of cost-benefit analysis in relation to policy choices must include consideration of health costs of air pollution.
- 6. Strengthen Australia’s air pollution regulatory scheme by putting a national Clean Air Act into place.**
 - The Commonwealth Government should be responsible for achieving clean air across Australia through the implementation of a national Clean Air Act or national scheme that the States and Territories comply with and is enforced.
 - The minimum standards in any air pollution law or regulatory system should be able to be amended as evidence and best practice change.
 - A national regulatory body should be established or tasked to enforce and monitor compliance.

Conclusion

It is important that the National Environment Protection Council continues to uphold and improve Australian air quality standards, particularly for those communities and populations disproportionately exposed and/or vulnerable to sources of air pollution in Australia. Such groups include children, the elderly, those living or working in airsheds affected by coal extraction and electricity generation, or high road traffic areas, those with chronic illnesses, and those currently experiencing health inequities.⁹

The Commonwealth Government must be responsible for standard setting to ensure that communities across Australia have the same strong level of protection. Moreover, the States and Territories must be responsible for on-ground implementation of air pollution laws in a way that is tailored to suit their jurisdiction. Improving ambient air quality standards in line with the above recommendations will reap health, climate and economic benefits for Australia vastly outstripping the costs associated with their implementation.

⁹ Knibbs et al 2018; Bowatte et al 2018; Pereira et al 2010.

References

1. Knibbs, Cortés de Waterman, Toelle, Guo, Denison, Jalaludin, Williams. (2018). The Australian Child Health and Air Pollution Study (ACHAPS): A national population-based cross-sectional study of long-term exposure to outdoor air pollution, asthma, and lung function. *Environment International*, 120, 394-403.
2. Bowatte, G, Lodge C, Knibbs L, Erbas B, Perret J, Jalaludin B, Dharmage S. (2018). Traffic related air pollution and development and persistence of asthma and low lung function. *Environment International*, 113, 170-176.
3. Jacob D J and Winner D A 2009 Effect of climate change on air quality *Atmos. Environ.* 43 51–63
4. Walter C et al June 2019 Expert Position Statement on health-based standards for Australian regulated thresholds of nitrogen dioxide, sulfur dioxide and ozone in ambient air. (This statement was coordinated by Clare Walter (Lung Health Research Centre) and Maxwell Smith (Environmental Justice Australia) in consultation with Ben Ewald, Eugenie Kayak and Ken Winkel (Doctors for the Environment Australia), Ekta Sharma and Paula Myott (Royal Australasian College of Physicians), Kelcie Herrmann and Judy Powell (Lung Foundation of Australia), Elena Schneider-Futschik (Lung Health Research Centre), Fiona Armstrong (Climate and Health Alliance), Robyn Schofield (Melbourne Energy Institute, Clean Air and Urban Landscapes Hub, University of Melbourne), Annabelle Workman (Melbourne Sustainable Society Institute), Prof Louis Irving (Royal Melbourne Hospital and the Peter MacCallum Cancer Centre), and Prof Gary Anderson (Lung Health Research Centre
5. Giannadaki et al. Implementing the US air quality standard for PM2.5 worldwide...*Environ Health* (2016) 15:88
6. Carnell E., Vieno M., Vardoulakis S., Beck R., Heaviside C., Tomlinson S., Dragosits U., Heal, M., Reis S., (2019). Modelling public health improvements as a result of air pollution control policies in the UK over four decades – 1970 to 2010. *Environmental Research Letters* 14, 074001.
7. Walter C et al June 2019 Expert Position Statement on health-based standards for Australian regulated thresholds of nitrogen dioxide, sulfur dioxide and ozone in ambient air.
8. (refs 2, 3, and) Pereira G, Cook A, De Vos AJBM, & Holman, CDAJ (2010). A case-crossover analysis of traffic-related air pollution and emergency department presentations for asthma in Perth, Western Australia. (Clinicalreport). *The Medical Journal of Australia*, 193(9), 511-514; Clifford H, Pearson G, Franklin P, Walker R and Zosky G (2015) Environmental health challenges in remote Aboriginal Australian communities: clean air, clean water and safe housing. *Australian Indigenous Health Bulletin* 15 (2).

APPENDIX A: CAHA Governance, Members, Experts

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