

## Air quality as a local issue

The World Health Organization considers air pollution to be the single most significant environmental threat to public health worldwide. Our understanding of the issue has increased significantly in recent years and we now know that there is no safe level of air pollution.

**3,000**

Approximate number of Australian deaths attributable to poor air quality each year<sup>1</sup>

**4.2m**

Global annual deaths from stroke, heart disease, lung cancer and chronic respiratory diseases that occur as a result of exposure to outdoor air pollution<sup>2</sup>

**\$3b**

Annual health costs of air pollution from internal combustion engine vehicles in Greater Sydney, Newcastle and Wollongong<sup>3</sup>

### AIR QUALITY AND THE UN SUSTAINABLE DEVELOPMENT GOALS

Local action to improve air quality supports multiple UN Sustainable Development Goals:



**Good health & Wellbeing**



**Affordable & clean energy**



**Reduced inequalities**



**Sustainable cities & Communities**

### An Australian concern

By global standards, Australian towns and cities tend to have relatively clean air most of the time. However, this is not the full picture and poor air quality poses a significant threat to the health and wellbeing of Australian communities:

#### 1 Periodic extremes

Periodic extreme air pollution events caused by bushfires, hazard reduction burning and dust storms, can create conditions comparable to the worst polluted cities in the world.

#### 2 Local and regional challenges

Certain communities, through a combination of geography, infrastructure and demographics, can experience regular poor air quality associated with specific local sources and conditions (e.g., wood-fired home heating, high traffic congestion, power generation and heavy industry).

#### 3 Hyperlocal hotspots

Air quality varies over short distances. Highly localised pollution spikes can occur (e.g. along major roads) and these can be in places where people live, work and play. These pollution hotspots are not accounted for when we report 'good' air quality for a larger area. A 2017 Sydney study of particulate pollution found the average roadside concentration to be double the recommended limit in national guidelines.

<sup>1</sup> AIHW Australian Burden of Disease Study, <https://www.aihw.gov.au/reports/burden-of-disease/abds-2018-interactive-data-risk-factors/contents/air-pollution>

<sup>2</sup> [www.who.int/health-topics/air-pollution](https://www.who.int/health-topics/air-pollution)

<sup>3</sup> NSW State of the Environment Report, <https://www.soe.epa.nsw.gov.au/all-themes/climate-and-air/air-quality#context>



## The impacts of poor air quality



### PUBLIC HEALTH

**Air pollution has a negative impact on all aspects of human health**, particularly on the lungs and heart. Evidence is mounting that air pollution also affects the brain and nervous system, reproductive health and in utero and childhood development.



### SOCIAL WELLBEING

**Marginalised and vulnerable people** (e.g. lower socio-economic demographics; CALD communities; people with pre-existing health conditions; people with disabilities) are disproportionately impacted by air pollution and urban heat, which are associated with higher risk of violent crime, domestic abuse, accidents and shortened attention spans in children.



### THE ECONOMY

**Air pollution has a negative impact on local economies.** If a place can be made pleasant, clean, cool and walkable it creates the foundation for a thriving local economy. Removing the local sources of air pollution, such as motor vehicles and wood-fired home heaters, helps to support local economies.



### CLIMATE CHANGE

**Most sources of air pollution are also sources of carbon emissions, and action to reduce them doubles as climate action.** As climate change intensifies extreme heat, it increases air pollution (by creating more ground-level Ozone) and amplifies the health impact of air pollution (by decreasing the body's ability to cope and disproportionately stressing already vulnerable people).

## Urgent leadership is required

**Air pollution is a serious issue for all Australians and it requires leadership and collaboration at all levels if it is to be effectively addressed.**

The NSW government manages a state-of-the-art network of air quality monitoring stations and is committed to providing accurate and up-to-date information, and to reducing the sources of air pollution.

In recent years, emerging smart sensor technologies have enabled local governments to step up and show increasing leadership on air quality. Armed with new data and insights, councils are able to take a variety of effective actions to improve air quality at the local level. Strategies include a variety of policy and planning interventions that support place-making, walkability, public transport, urban greening, the removal of cars from civic centres, and the removal of wood-burning heaters, as well as participatory community engagement, education and outreach.

## Common air pollutants and their sources

Pollutant	Description	Human Sources										Natural Sources				
		Transport (road)	Transport ( maritime, rail, air)	Diesel generators	Domestic wood burning	Power stations and factories	Agriculture (land use)	Mines, quarries and construction	Climate change (extreme heat, urban heat islands, drought)	Waste management facilities	Hazard reduction burns	Thunder storms	Bushfires	Plants (pollen, turpenes)	Sea Salt	Wind-blown dust
<b>Particulate Matter</b>																
PM1	Very fine particulate matter $\leq 1\mu\text{m}$															
PM2.5	Fine particulate matter $\leq 2.5\mu\text{m}$															
PM10	Particulate matter $\leq 10\mu\text{m}$															
<b>Gases</b>																
NO2	Nitrogen Dioxide															
SO2	Sulphur Dioxide															
CO	Carbon Monoxide															
O3	Ozone (ground-level) Forms through the reaction of NOx, SOx, VOCs and heat															
CO2	Carbon Dioxide															
VOC	Volatile Organic Compounds															

Please note that one micrometre ( $\mu\text{m}$ ) is one millionth of a meter (i.e.,  $1 \mu\text{m} = 1 \times 10^{-6} \text{ m}$ ) and one nanometre (nm) is one billionth of a meter (i.e.,  $1 \text{ nm} = 1 \times 10^{-9} \text{ m}$ ).



Traffic congestion is a major contributor to poor air quality

### Further reading

- [New South Wales Department of Industry and Environment – Air Topic page](#)
- [CAUL HUB: Clean Air and Urban Landscapes Hub](#) – Six year research consortium (2015–2021) funded by the Australian National Environmental Science Program. Extensive resources on air quality in Australia
- [The World Health Organisation policies and programs](#) and [WHO Global Air Quality Guidelines 2021](#) are setting long, short, and interim targets for continuous air quality improvement
- [C40 Clean Air Cities Declaration](#) - 35 global cities have formally committed to take decisive action on air quality
- [Climate and Clean Air Coalition](#) - a voluntary partnership of governments, intergovernmental organisations, businesses, scientific institutions, NGOs, and citizens for action on air quality
- [BreatheLife](#) - New joint initiative of the WHO, UNEP, World Bank, and CCAP

### FIND OUT MORE AND ACCESS OPENAIR RESOURCES

This factsheet is part of a suite of resources designed to support local government action on air quality through the use of smart low-cost sensing technologies. It is the first Australian project of its kind. Check the project website for resources and updates on post project collaborations: [www.openair.org.au](http://www.openair.org.au)

