



# Sydney Air Quality Study Stage 2

Department of Planning and Environment



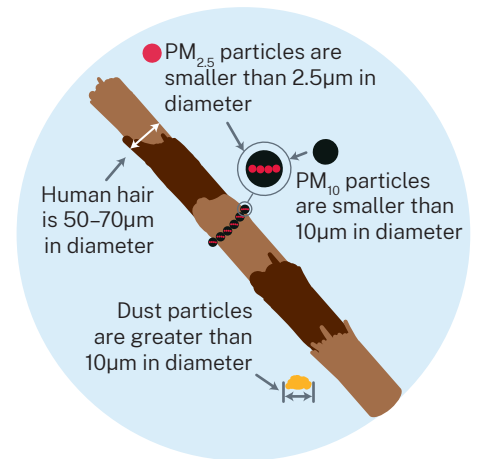


The Sydney Air Quality Study is a multi-year research program. The study was designed to provide information on the state of air quality and health burden of air pollution in the NSW Greater Metropolitan Region, while supporting the improvement of current and future air quality. The program was led by the NSW Department of Planning and Environment (the department), in collaboration with the NSW Environment Protection Authority (the EPA) and the NSW Ministry of Health.

The Stage 2 – health impact assessment report presents new findings of health cost analyses.

## What are air pollutants and where do they come from?

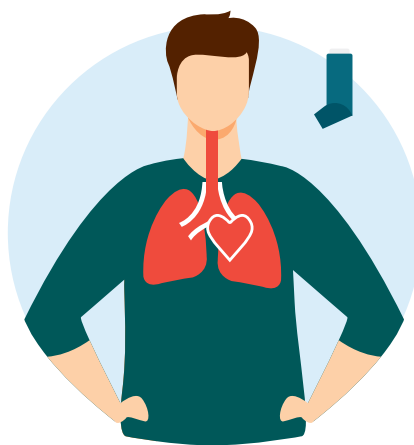
Air pollutants can be found anywhere because they come from human-made and natural sources (e.g. dust, pollen, bushfires and motor vehicles). Particles are also known as ‘particulate matter’ or PM, they are measured by their diameter and come in various sizes. Air pollution includes: PM<sub>10</sub> – coarse particles less than 10 micrometres (µm) and PM<sub>2.5</sub> – fine particles less than 2.5 µm.



**Figure 1** Know your particles

## Which particles have the greatest effect on health?

Determining the health risks caused by air pollution is critical in the development of effective policies. PM<sub>2.5</sub> has the greatest effects on human health. Long-term exposure to PM<sub>2.5</sub> can cause heart and lung disease.



**Figure 2** Effects of PM<sub>2.5</sub>

PM<sub>2.5</sub> and PM<sub>10</sub> can cause heart and lung disease. They are invisible to the eye and can be inhaled into the lungs. PM<sub>2.5</sub> particles are so small they can travel through the lungs and into the bloodstream.

The elderly, children and people with existing heart and lung problems are most at risk.



## How was the study done?

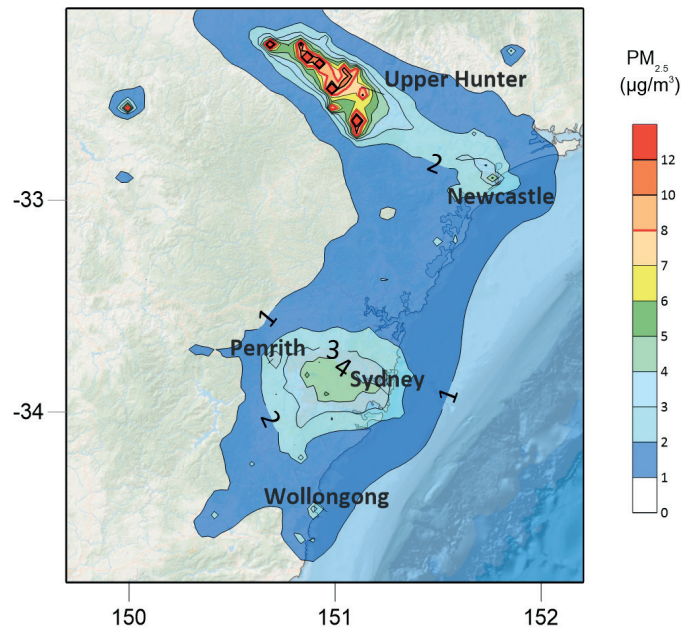
The Sydney Air Quality Study draws on data and information from the NSW Air Quality Monitoring Network and the NSW Greater Metropolitan Region air emissions inventory. In this study, an air quality modelling framework was established to study how air quality varies over time and space, and to assess how major sources contribute to air pollution in the metropolitan region. The report can be viewed on our [Sydney Air Quality Study webpage](#).

## What did we find out?

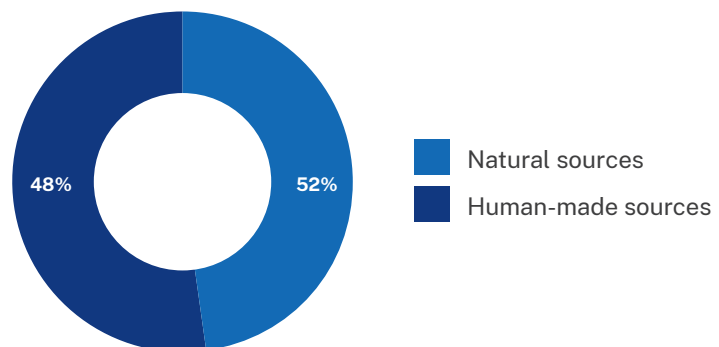
### Modelled PM<sub>2.5</sub> concentrations and pollution exposure

The annual average PM<sub>2.5</sub> concentrations were modelled for the Greater Metropolitan Region. Human-made sources (see table on page 4) contributed to higher PM<sub>2.5</sub> pollution in the Upper Hunter, Sydney, Newcastle and Wollongong regions (Figure 3).

Exposure modelling provides an estimate of the level of air pollutants people were exposed to. Human-made sources contributed 48% to population exposure to PM<sub>2.5</sub> concentrations (Figure 4).



**Figure 3** Average concentrations of human-made PM<sub>2.5</sub> represented in micrograms per cubic metre (µg/m<sup>3</sup>) predicted by the air quality model.

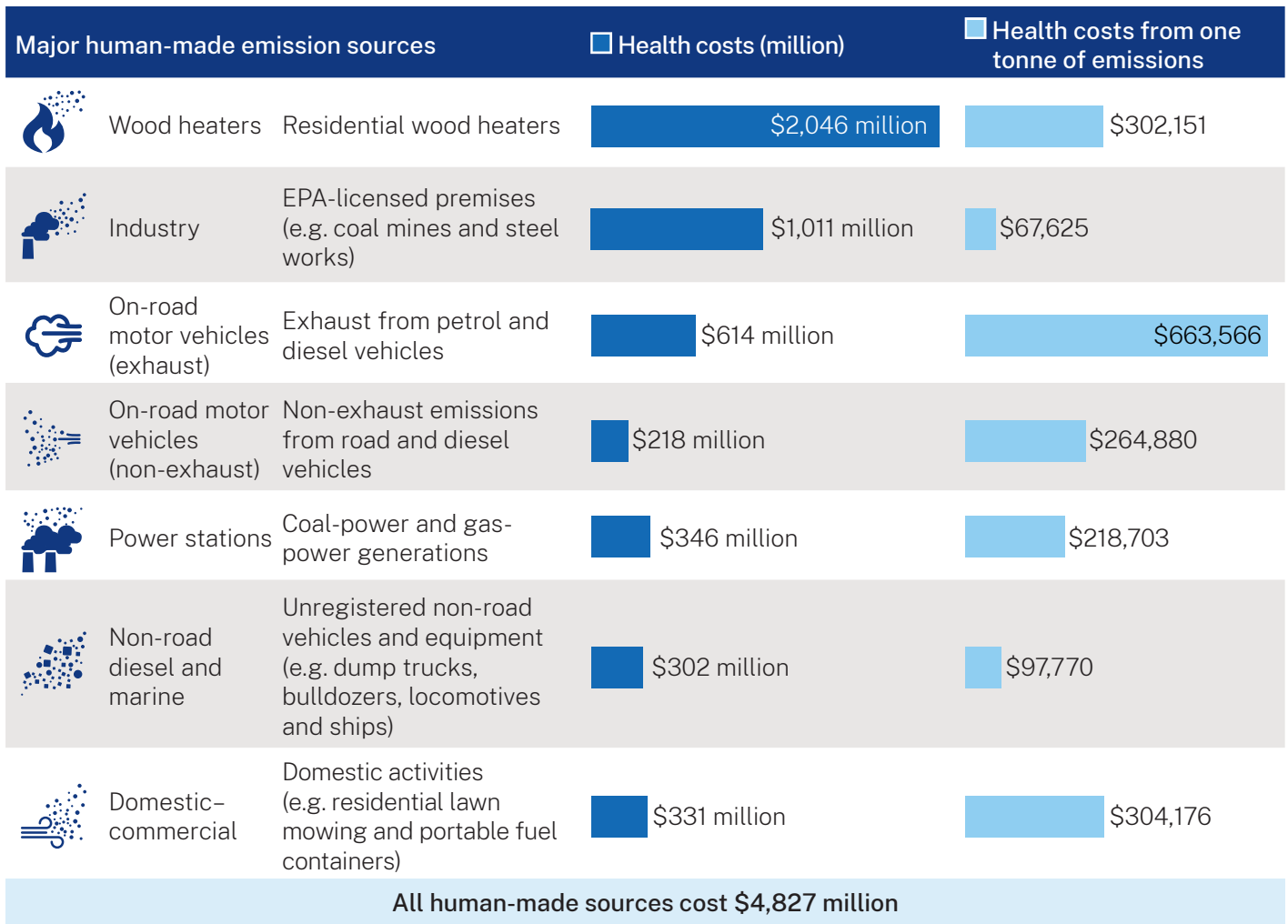


**Figure 4** Percentage contribution of natural and human-made sources to the population's exposure to PM<sub>2.5</sub>.

# Health cost of long-term exposure to human-made PM<sub>2.5</sub>

The impacts of long-term exposure to PM<sub>2.5</sub> were valued around \$5 billion (in 2021 Australian dollar value).

## Major human emission source and associated health costs\*



\*Note: Health cost is estimated based on years of life lost and all dollar values are 2021 Australian dollar values.

### More information

For more information please visit [environment.nsw.gov.au/sydney-air-quality-study](https://environment.nsw.gov.au/sydney-air-quality-study)



### Financial health costs from one tonne of emissions

- on-road motor vehicles (exhaust) emission cost about \$663,000
- residential wood heater and domestic-commercial (e.g. residential lawn mowing and portable fuel containers) emissions each cost about \$300,000

### What are we doing to protect people across NSW?

Clean air is important for our health. Air pollution is a local, regional and global issue. The choices and actions of governments and people can improve our communities.

In early 2022, the NSW Government released the [NSW Clean air strategy 2021-30](#) which presents a whole-of-government approach to improve air quality and health outcomes for people who live and work in cities and regions across NSW.