

# Proposal to vary the Ambient Air Quality Measure in relation to the standards for particles

## Question and answer fact sheet

### What is the current status of Australia's air quality?

Australia's air quality is high by world standards and annual average concentrations of ambient pollutants are generally below current air quality standards. Improvements to Australia's air quality over the past decade have been achieved through ambient air quality standards, fuel quality standards, vehicle emission standards and state-based action, such as controls on industry. However, some air pollutants such as particulate matter continue to cause health concerns.

### Are further air improvements necessary given that we already enjoy relatively good air quality in Australia?

Recent international studies show that the effects of air pollution on human health are observed below current pollutant concentration levels. Further reducing ambient air pollution will result in substantial health and economic benefits.

Over the past few decades ambient concentrations of most pollutants have decreased in most jurisdictions. However, this is likely to be reversed in the future due to growth in Australia's population, economic activity and emissions. Any increase in population exposure will increase the incidence of adverse health outcomes and the associated economic costs of air pollution to society.

### What is the Ambient Air Quality NEPM?

The Ambient Air Quality NEPM is an instrument established in 1998 under the National Environment Protection Act 1994 (NEPC Act) to provide a nationally consistent framework for monitoring and reporting on six common ambient air pollutants – carbon monoxide, lead, nitrogen dioxide, photochemical oxidants (ozone), sulfur dioxide and particulate matter (PM) as the larger size fraction of PM10. It was varied in 2003 to include smaller sized particles, PM2.5.

The Ambient Air Quality NEPM sets national air quality standards and goals for each of these pollutants (advisory reporting standards only for PM2.5), which jurisdictions monitor and report against. The NEPM aims to guide policy formulation that allows for the adequate protection of human health and wellbeing. It does not compel or direct pollution control measures, or set penalties for non-compliance.

The implementation of the Ambient Air Quality NEPM is outside the NEPC's jurisdiction and is achieved through state and territory legislation and regulations. Each jurisdiction is required to allocate sufficient resources to enact the Ambient Air Quality NEPM and report annually on its implementation.

### Why do we need the Ambient Air Quality NEPM?

The Ambient Air Quality NEPM provides a harmonised national framework for all Australian jurisdictions to monitor and publicly report on common ambient air pollutants. It removes potential conflicts or inconsistencies between individual state and territory-based approaches, as all jurisdictions are subject to identical criteria.

The standards and goals of the Ambient Air Quality NEPM aim to guide policy formulation that allows for the adequate protection of health and wellbeing.

Jurisdictions use the Ambient Air Quality NEPM standards in legislation or guidance (e.g. design goals, licence conditions, planning instruments) to manage air quality and emissions from specific sources.

The Ambient Air Quality NEPM standards are based on health evidence of the impacts of air pollutants available at the time the standards are set. They are designed to provide protection to people from the pollutants' adverse human health effects. The standards are also designed to be realistically achievable in the different Australian jurisdictions with a focus on large urban areas, where the majority of Australia's population resides.

## Why was the Ambient Air Quality NEPM reviewed?

Standards need to be periodically reviewed to take into account the latest scientific evidence as health research on the impacts of pollutants continues to evolve and new findings emerge.

For example:

- the World Health Organisation's Review of evidence on health aspects of air pollution project (2013); and
- the United States Environment Protection Agency's Integrated Science Assessment for Particulate Matter (2009)

The Ambient Air Quality NEPM needs to be updated to reflect latest methodologies as monitoring methods improve over time. For example, there is now a better understanding of concentrations across Australia, particularly for PM2.5, for which data was lacking when the Ambient Air Quality NEPM was varied in 2003.

## Why are the standards relating to particles the only standards proposed for review at this time?

Particles have been prioritised at this stage because there is strong evidence associating particle exposure with adverse human health outcomes and that there is no clear threshold of particle pollution below which health effects do not occur. This means that adverse health effects may be observed at the concentrations currently experienced in Australian cities, even where these are below the current standards.

Peak PM10 levels have been reported to exceed the national standard in nearly all regions of Australia, although peak particle levels can be seasonal and most often associated with summer dust storms, bushfires and prescribed burning events. Given the widespread emissions sources of particles, the potential health benefits of reducing population exposure to particles and the associated economic savings for society are greater than those for other pollutants. The range of cost-effective abatement policies and actions available for particles is also larger than that for other pollutants.

Work on other pollutants (ozone, nitrogen dioxide and sulfur dioxide) has been initiated and will continue to be progressed under the National Clean Air Agreement.

## What is the purpose of the Impact Statement on options to vary the Ambient Air Quality NEPM particles standards?

The Impact Statement is required as part of the statutory process to vary a NEPM and provides an opportunity for the community to review and comment on the supporting evidence to vary the Ambient Air Quality NEPM particles standards. It presents options for tighter national monitoring and reporting standards for air particle pollution.

Submissions can be made in writing or through the publically available online portal and will be considered when developing the final recommendation to NEPC to vary the Ambient Air Quality NEPM. A summary of submissions will be prepared considering all responses.

## What does the Impact Statement propose?

The Impact Statement outlines, for consideration, options for changes to the Ambient Air Quality NEPM particles standards. The major proposed changes relate to:

- changing the advisory reporting standards for PM2.5 to performance standards
- introducing an annual average standard for PM10
- more stringent reporting standards for PM10 and PM2.5
- introducing an exposure reduction framework to further reduce particle exposure
- the handling of natural events and the number of allowable exceedances per year.
- The proposed standards have been identified by linking health impacts with viable abatement measures for achieving the standards. This differs from the previous standard setting approach which assessed health impacts only.

### Summary of preferred options

Aspect	Metric	To be included in Ambient Air Quality NEPM?	Numerical value	Form of standard
Air quality standards	PM <sub>10</sub> – annual mean	Yes	Status quo with consideration of 20 µg/m <sup>3</sup>	–
	PM <sub>10</sub> – 24-hour mean	Yes	40 - 50 µg/m <sup>3</sup>	To be agreed
	PM <sub>2.5</sub> – annual mean	Yes	8 µg/m <sup>3</sup>	–
	PM <sub>2.5</sub> – 24-hour mean	Yes	25 µg/m <sup>3</sup>	To be agreed
Exposure-reduction framework co-option	Exposure index based on average PM <sub>2.5</sub> concentration at urban Ambient Air Quality NEPM monitoring sites within a jurisdiction	Yes	Continual improvement and/or no deterioration. Exposure index used to assess progress in reducing population exposure	To be agreed 3 year rolling average exposure

Further details are available in Section 9 of the Impact Statement

## Are the proposed particle standards in line with international standards?

The World Health Organisation (WHO) has established health-based air quality guidelines for the most common ambient air pollutants. These guidelines provide an adequate level of human health protection, based solely on health considerations, and are used as the basis for air quality standards in many countries. WHO recognises that individual countries will need to balance health risks, technological feasibility, economic and social considerations when converting the guidelines to standards in their own country.

The options for standards presented in the Impact Statement are based on international guidance (for example the WHO, US EPA) but are informed by Australian conditions, including natural background and current air quality trends.

It is not straightforward to interpret numerical comparisons of standards and they do not necessarily mean Australian standards are more stringent. For example, to a large degree, the lower standards in Australia are made possible by relatively low natural background concentrations and the absence of significant trans-boundary pollution which is a major issue in Europe.

## What will the proposed particle standards mean for public health?

Enquiries about the health impacts of particles are best directed to your state or territory health department.

If jurisdictions adopt emission reduction measures that enable the particles standards to be achieved, substantial health benefits can be expected. Potential impacts were estimated in the Health Risk Assessment and have been summarised in a Summary for Policy Makers of the Health Risk Assessment on Air Pollution in Australia.

Long-term exposure to current levels of PM<sub>2.5</sub> is estimated to contribute to around 1,600 premature deaths per annum across Sydney, Melbourne, Brisbane and Perth. Even though current exposures are below the proposed annual PM<sub>2.5</sub> standard, a decrease in exposure to PM<sub>2.5</sub> will have health benefits.

The Economic Analysis supporting the Impact Statement estimates that by 2036 the health benefit of meeting the standards proposed in this review would be around \$20.7 billion to \$21.7 billion, while the net benefits after including costs of abatement measures are around \$6.4 billion to \$7 billion.

## I live in an area that is impacted by air pollution. How will changes to the Ambient Air Quality NEPM improve air quality for me?

The Ambient Air Quality NEPM provides national standards for jurisdictions to monitor and publicly report on air pollution. Changes to the standards will provide more stringent targets for jurisdictions to implement.

Proposed changes to the Ambient Air Quality NEPM are based on the latest scientific evidence and are intended to drive reduced population exposure to particle pollution and thereby reduce the risk of health impacts.

The proposed exposure reduction framework seeks a continued reduction in exposure to air pollution, even if standards are met. It would be complementary to the air quality standards, and would continually drive air quality improvement across all communities.

## How are jurisdictions held accountable for poor air quality?

Under the NEPC Act, accountability for meeting the standards lies in public reporting. Jurisdictions are required under the Ambient Air Quality NEPM to report on the implementation and effectiveness of the Ambient Air Quality NEPM to NEPC each year. Reports must include an evaluation of performance at each monitoring station against the Ambient Air Quality NEPM standards and goals, comprising an analysis of the extent to which the standards are met, a statement of progress made towards achieving the goal, and a description of the circumstances that led to any exceedences of the standards, including the influence of natural events and fire management.

## How will the proposed particles standards be achieved?

Meeting the particles standards requires consideration of the introduction of new abatement measures at both national and jurisdictional levels. Abatement measures can reduce emissions, reduce ambient concentrations, and/or reduce exposure. Nationally, these may include measures to address emissions from sources such as wood heaters, non-road spark ignition engines (as used in lawnmowers, handheld garden equipment and outboard marine engines) and non-road diesel engines (as used in construction and mining equipment, cranes, forklifts, generators, etc). Jurisdictions consider measures that are applicable for their own circumstances. Examples of measures that could be considered at a national or state level, examined in the Economic Analysis include:

- diesel trains – introduction of emission standards, accelerated replacement of old locomotives, and driver assistance software to reduce fuel use
- in-service diesel equipment – extension to other jurisdictions of the NSW framework for retrofitting high-polluting diesel engine equipment with diesel particulate filters
- shipping – use of low sulfur fuel at-berth, and a memorandum of understanding to reduce vessel speed as ships approach and depart ports

- coal dust – application of best practice controls for PM at mines
- light commercial vehicles – behaviour change program (for example ‘eco-driving’ to reduce engine idling), and a targeted inspection and maintenance program using a remote-sensing device to identify high-emitting vehicles.

In April 2014, Australia’s Environment Ministers initiated work to identify strategic priorities and approaches as a basis for a National Clean Air Agreement, and agreed to consider working towards finalising an agreement by 1 July 2016. Reflecting the significance of particle emissions from non-road spark ignition engines and wood heaters, Ministers requested finalisation, by September 2014, of Decision Regulation Impact Statements on potential emission control options for these sectors.