



Fact sheet

Coal-fired power stations and health

Health impacts of air pollution from coal fired power stations

Coal-fired power stations emit a range of toxic substances that have serious impacts on the communities that live near them such as fine particle pollution (PM_{2.5}), mercury, nitrogen oxides and sulphur dioxide, carbon monoxide, hydrochloric acid and volatile organic compounds.

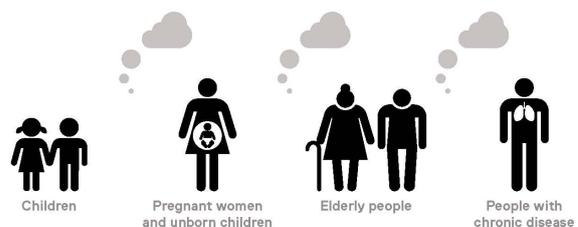
PM_{2.5}, nitrogen oxides and sulphur dioxide are three of the pollutants from power stations that cause particular concern for community health. All three of these pollutants are extremely harmful to health: causing and worsening a range of medical conditions such as asthma, respiratory problems, stroke, angina, heart attack, and cancer.¹ They irritate and inflame the lungs leading to chronic lung disease, and restricted lung growth in children². Children and elderly people are particularly affected.

AIR POLLUTION HEALTH IMPACTS

HEALTH IMPACTS OF AIR POLLUTION

- Impaired lung growth in children
- Increased asthma, coughs and bronchitis
- Impairment of brain development in babies and small children
- Low birth weight and adverse birth outcomes
- Heart attack and stroke
- Upper respiratory track irritation and infection
- Worsening of existing health problems in people with chronic disease

PEOPLE MOST SUSCEPTIBLE



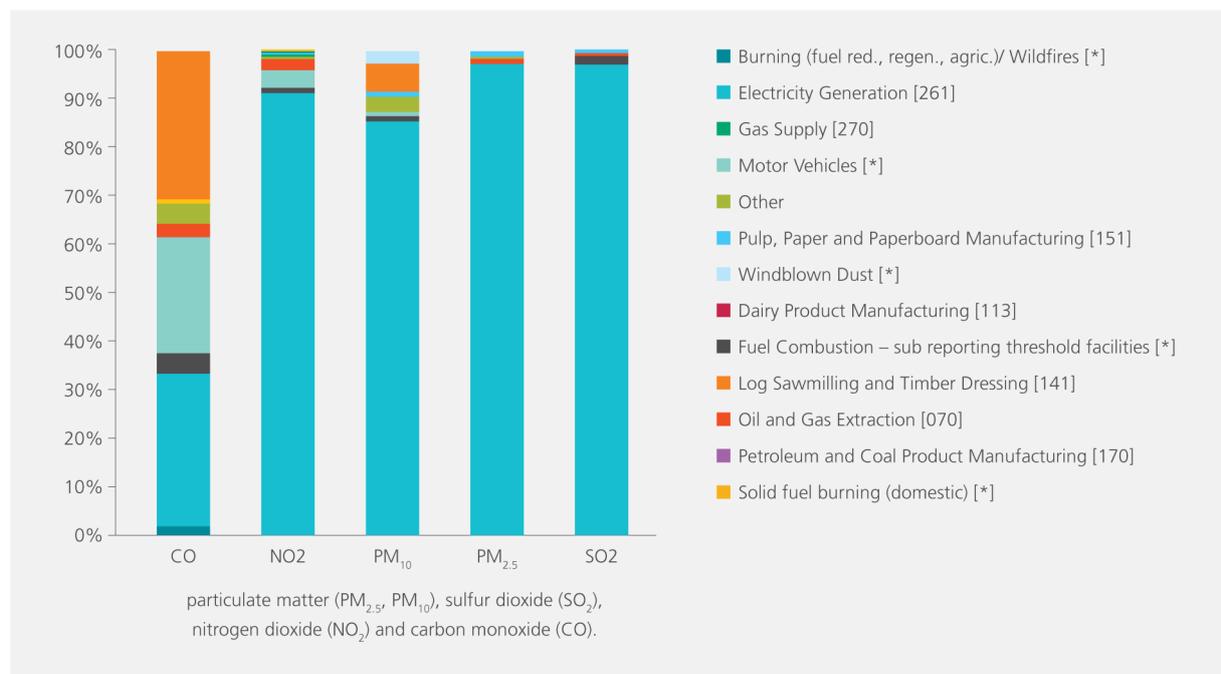
¹ Casteleden W, et al, *The mining and burning of coal: effects on health and the environment* MJA 195 (6) 19 September 2011

² Shearman, D, *Why coal-fired power stations need to shut on health grounds*, The Conversation, 28 November 2016 <https://theconversation.com/why-coal-fired-power-stations-need-to-shut-on-health-grounds-68809>

The impact on local communities

For many communities living near power stations, the power stations are the main source of air pollution. For example, as shown in the graph below 95% of air pollution in the Latrobe Valley is from burning coal.³

Figure 6. Emission contribution to the Latrobe Valley air shed from industry and diffuse sources such as vehicles, wood-fires, windblown dust and bushfires.¹⁵⁷



Source: Hazelwood Mine Fire Inquiry Report Vol III - Health Improvement p71

In the Hunter Valley, studies indicate 30–40% of fine particle pollution is caused by power stations.⁴

Although some pollutants such as fine particle pollution can travel great distances, it is the local community that suffers the most exposure. People that live within 50kms of coal-fired power stations face a risk of premature death as much as 3–4 times that of people living further away.⁵ It has been estimated that the air pollution from Hazelwood alone causes 18 premature deaths a year in the Latrobe Valley.⁶ The annual costs of associated health damages from the five coal-fired power station in the Hunter Valley have been estimated at around \$600 million per annum.⁷ The annual health costs of coal-fired power stations across Australia has been estimated at about A\$2.6 billion a year.⁸

While local communities have the greatest exposure to power station pollution, communities living further away are also affected. Air pollutants from coal-fired power stations travel long distances, with much of the PM_{2.5} found in Sydney's air being from the Hunter Valley.

³ Hazelwood Mine Fire Inquiry Report Vol III - Health Improvement p71 <http://hazelwoodinquiry.vic.gov.au/201516-report/volume-iii-health-improvement/>

⁴ NSW Office of Environment and Heritage, *Upper Hunter Particle Characterisation Study*, 2013, p.iv <http://www.environment.nsw.gov.au/resources/aqms/UHFPCSFinal.pdf>

⁵ Epstein PR, Testimony for the Kentucky General Assembly, House of Representatives Committee on Health and Welfare. London, Kentucky: Kentuckians for the Commonwealth 2010 http://www.kfca.org/sites/default/files/docs/resources/dr_epstein_testimony.pdf

⁶ Ward J and Power M, Harvard Kennedy School of Government *Cleaning up Victoria's Power Sector: the full social cost of Hazelwood power station* 2015 http://environment.vic.gov.au/newsroom/report/cleaning-victoria%E2%80%99s-power-sector#_VTR2TSGeDRY

⁷ Climate and Health Alliance, *Cool and health in the Hunter: Lessons from one valley for the world* 2015 <http://www.caha.org.au/projects/hunter-coal/>

⁸ Australian Academy of Technological Sciences and Engineering, *The Hidden Costs of Electricity: Externalities of Power Generation in Australia*, 2009 www.atse.org.au/Documents/Publications/Reports/Energy/ATSE%20Hidden%20Costs%20Electricity%202009.pdf

The health benefits of reducing air pollution

It is well established that there are health benefits for every tonne of pollution that a community is not exposed to, especially in relation to particulate pollution.⁹ Reductions in pollution can result in immediate health benefits such as lower asthma rates and fewer hospital visits.

A number of examples from around the world demonstrate this:

- In 2001 coordinated effort by local governments around Launceston, Tasmania, culminated in the introduction of the Launceston Wood Heater Replacement Program which resulted in a significant reduction in PM_{2.5} (the same pollutant that causes the most health impacts from coal-fired power stations). This resulted in significant reductions in deaths for males in Launceston from cardiovascular and respiratory conditions.¹⁰
- The town of Libby, Montana, USA, replaced a portion of its high emission wood burning stoves with less emission intensive alternatives (1147 stoves were replaced) resulting in a 27.5% reduction in PM_{2.5} concentrations in the winters immediately following the replacements. There were immediate health impacts on local children, with a 26.7% reduction in reported wheezing symptoms in children for correlating to the decrease in winter PM_{2.5}.¹¹
- In 1990 Hong Kong reduced its fuel oil sulphur content levels, leading to an immediate reduction in sulphur dioxide in the air. A study found this led to a substantial reduction in seasonal deaths within the first 12 months, which then increased and peaked, and eventually reduced to the predicted levels. The study concluded there are both immediate and long-term health benefits to such air quality controls.¹²
- The health impacts of PM₁₀ were studied in the Utah and Salt Lake Valleys in relation to the intermittent operation of a steel mill from 1985 to 1989. Findings were that 'average hospital admissions in Utah Valley for bronchitis and asthma were substantially higher when the steel mill was open than when it was closed'.¹³ (PM₁₀ is a significant air pollutant from coal mines, which are prevalent in many areas where coal-fired power stations are located and therefore have an associated health impact on the community.)
- A study conducted comparing air pollution levels (ozone, nitrogen dioxide and PM_{2.5}) and emergency room visits for asthma in Ontario, Canada—found that there were more hospital visits for children aged 2–14 on days when pollution levels were high, and fewer visits when pollution levels were low.¹⁴

As can be seen from these examples there are significant health benefits for every tonne of air pollution that is reduced, and the health benefits will continue to increase as pollution decreases.

⁹ See for example Draft Variation to the National Environment Protection (Ambient Air Quality) Measure Impact Statement Prepared for National Environment Protection Council, July 2014 <http://www.environment.gov.au/protection/nepc/nepms/ambient-air-quality/variation-2014/impact-statement> and Department of Infrastructure and Transport, *Final Regulation Impact Statement for Review of Euro 5/6 Light Vehicle Emissions Standards*, Canberra (2010) pp55-57 http://www.infrastructure.gov.au/roads/environment/files/Final_RIS_Euro_5_and_6_Light_Vehicle_Emissions_Review.pdf.

¹⁰ Johnston F et al, *Evaluation of interventions to reduce air pollution from biomass smoke on mortality in Launceston, Australia: retrospective analysis of daily mortality, 1994–2007* BMJ 2013; 346 :e8446

¹¹ Noonan C et al, *A rural community intervention targeting biomass combustion sources: effects on air quality and reporting of children's respiratory outcomes*, Occup Environ Med. 2012 May;69(5):354–60.

¹² Hedley A et al, *Cardiorespiratory and all-cause mortality after restrictions on sulphur content of fuel in Hong Kong: an intervention study*, Lancet. 2002 Nov 23;360(9346):1646–52

About Environmental Justice Australia

Environmental Justice Australia (formerly the Environment Defenders Office, Victoria) is a not-for-profit public interest legal practice. Funded by donations and independent of government and corporate funding, our legal team combines a passion for justice with technical expertise and a practical understanding of the legal system to protect our environment.

We act as advisers and legal representatives to the environment movement, pursuing court cases to protect our shared environment. We work with community-based environment groups, regional and state environmental organisations, and larger environmental NGOs. We also provide strategic and legal support to their campaigns to address climate change, protect nature and defend the rights of communities to a healthy environment.

While we seek to give the community a powerful voice in court, we also recognise that court cases alone will not be enough. That's why we campaign to improve our legal system. We defend existing, hard-won environmental protections from attack. At the same time, we pursue new and innovative solutions to fill the gaps and fix the failures in our legal system to clear a path for a more just and sustainable world.

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