

The health burden of fine particle pollution from electricity generation in NSW

There is no safe level of air pollution

Air pollution is extremely harmful to health. Coal-fired power stations release more than 30 toxic pollutants and are the single biggest source of dangerous sulfur dioxide (SO₂), oxides of nitrogen (NOx) and fine particle pollution (PM_{2.5}) in Australia. PM_{2.5} has the strongest impact on our health. Coal-fired power stations produce pollution particles of two kinds: the primary particles that are released as coal is burnt, and secondary particles that form in the atmosphere from the SO₂ and NOx gases released during combustion. Tiny particles of pollution are drawn deep into the lungs and then move into the bloodstream.

There are five coal-fired power stations in NSW – Liddell, Eraring, Mt Piper, Bayswater and Vales Point. Two are located on the Central Coast of NSW, two in the Upper Hunter Valley and one in Lithgow. These power stations cause adverse health impacts in Sydney, Newcastle, Lithgow, Central Coast and the Hunter Valley.

The list of health impacts and disease to which air pollution contributes now includes heart disease, stroke, asthma attacks, low birth weight of babies, lung cancer and type 2 diabetes.

Studies from around the world have found there is no safe level of air pollution. Reducing exposure to air pollution to as close to zero as possible leads to better health.



Coal-fired power stations cause serious health problems

A new study by Dr Ben Ewald, a specialist on population health,¹ examines the health burden from exposure to PM_{2.5} pollution from coal-fired power stations in NSW. The study looked at three health outcomes that can result from this pollution:

- premature death,
- the incidence of low birth weight babies, and
- new cases of type 2 diabetes.

The study found that power station pollution from the five NSW power stations causes:

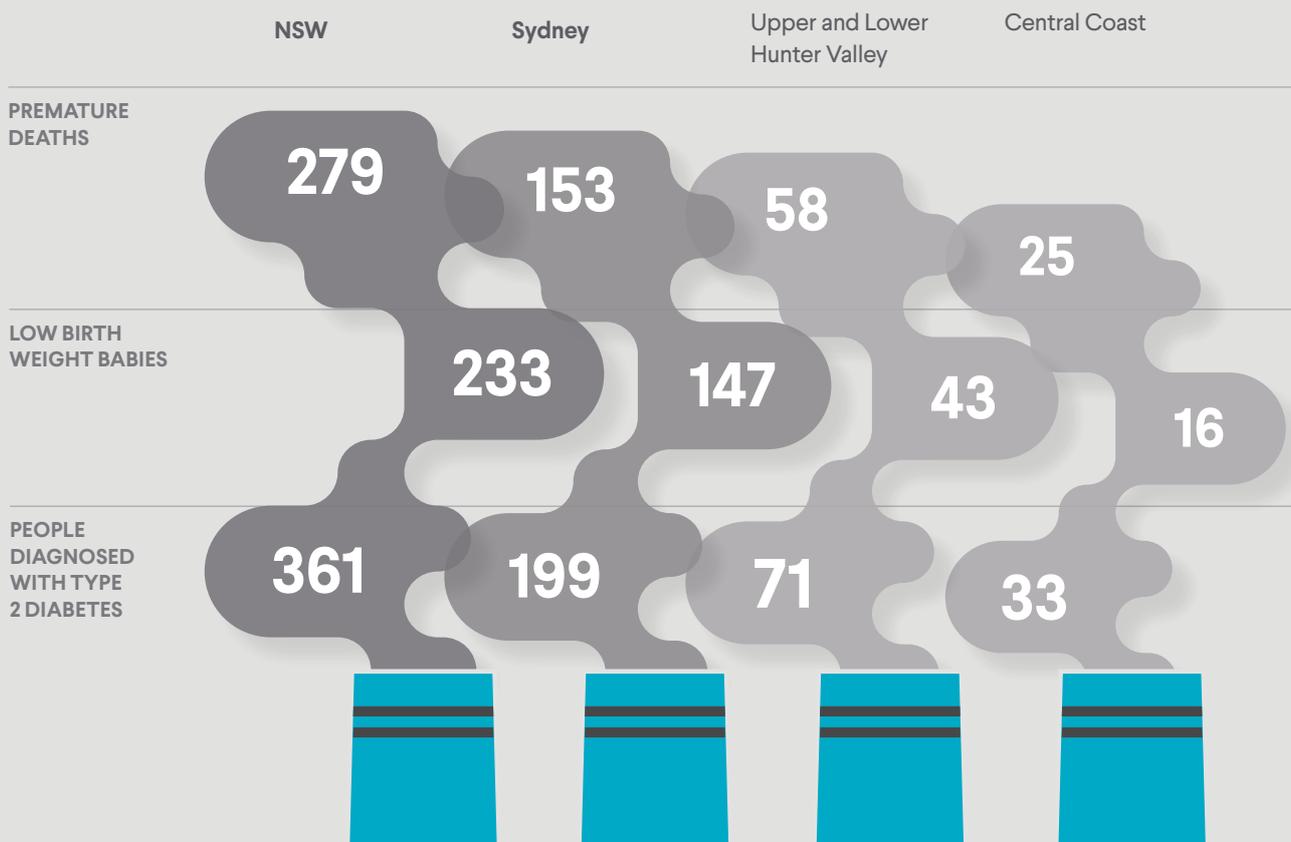
- 279 premature deaths,
- 233 babies born with low birth weight (less than 2500g), and
- 361 people developing type 2 diabetes every year, who would not otherwise do so.

WHAT IS THE IMPACT OF EACH OF THE POWER STATIONS?

Each power station contributes significantly to the health burden caused by power generation. Eraring and Vales Point on the NSW Central Coast make the largest contribution, since prevailing weather patterns are most likely to carry pollutants from these sources into the Sydney basin where the majority of the state's population resides.



Health impacts each year in regions affected by NSW power station pollution

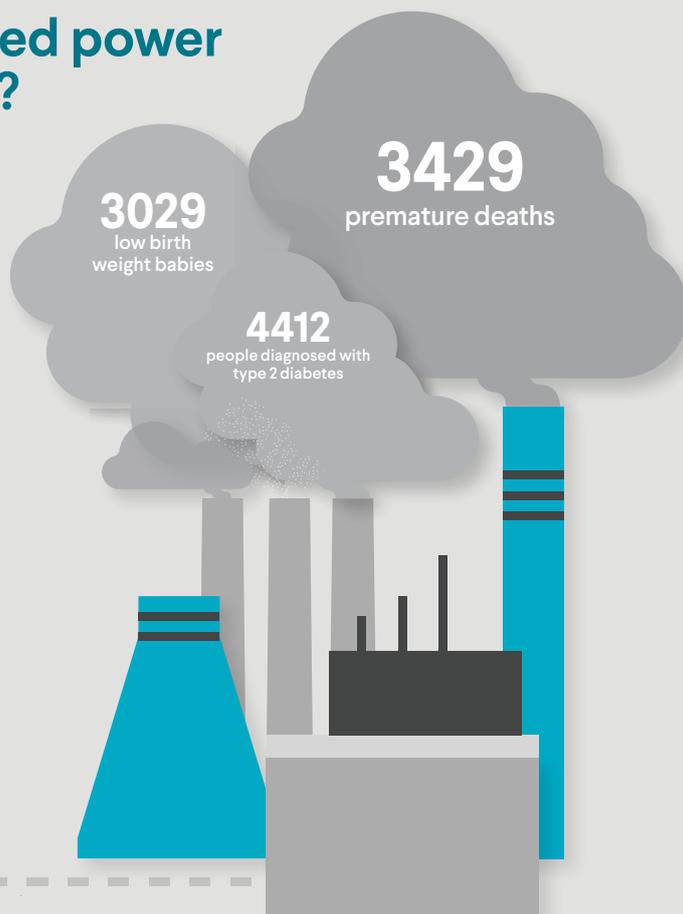


What happens if NSW coal-fired power stations stay open as planned?

If the five power stations remain open until their expected closure dates, it is estimated that **3429 additional premature deaths** will occur in NSW between now and when the power stations are anticipated to close. This figure does not include deaths since the power stations opened decades ago, so the true number of premature deaths over the life of the power stations is far greater.

Power station	Premature deaths	Low birth weight	Type 2 diabetes
Bayswater	685	571	857
Liddell	107	89	134
Eraring	1219	1058	1579
Vales Point	547	475	709
Mount Piper	871	835	1133
Total	3429	3029	4412

These health impacts can be reduced by installing pollution controls or retiring power stations sooner.



What about Sydney?

Few people in Sydney would realise that 87% of the SO₂ and 54% of the NO_x in their air comes from power stations in the Hunter Valley, Central Coast and Lithgow. Pollution from the coal-fired power stations travels long distances to contaminate the air in Sydney despite the power stations being 90, 100 and 160 km away.

Sydney is bearing the greatest health burden, where air pollution from power stations causes **153 premature deaths** each year, and results in **1433 years of life lost**, **147 low birth weight babies** and **199 new cases of diabetes**. These health impacts are primarily caused by the Eraring (38.4%), Mt Piper (23.7%) and Vales Point (20.1%) power stations.

POWER STATION POLLUTION TRAVELS TO SYDNEY



¹Ewald B, The health burden from fine particle pollution due to electricity generation in NSW, November 2018 at www.envirojustice.org.au/healthstudynsw

HOW CAN WE FIX THIS PROBLEM?

The coal-fired power stations in NSW create a substantial health burden that is entirely unnecessary. Although the NSW power stations have been required to upgrade their pollution controls to capture primary PM_{2.5}, none of the power stations use post-combustion capture of SO₂ or NOx, which are a major contributor to current health problems.

Substantial death and disease could be avoided by imposing stricter licensing conditions for operation that would require capture of SO₂ and NOx, or by bringing forward closure of plants where the upgrade is uneconomic.

RECOMMENDATIONS

1. The pollution licences for all Australian coal-fired power stations should be amended to set stack emission limits consistent with international best practice (200mg/m³ for SO₂ and NOx and 20mg/m³ for particle pollution).
2. Australia's coal-fired power stations should be required to install best practice emission controls including bag filters, Selective Catalytic Reduction, Flue Gas Desulfurisation and Activated Carbon Injection to control emissions of fine particle pollution, oxides of nitrogen, sulfur dioxide and mercury respectively in the order of 90%.
3. Australia's coal-fired power stations should be required to conduct continuous stack emissions monitoring, with real-time pollution monitoring data readily available to community members (e.g. through the NSW Office of Environment and Heritage website).
4. Further research should be commissioned to assess the health burden from all power stations in Australia.

For more information go to www.envirojustice.org.au/healthstudynsw

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Health impacts each year in regions affected by NSW power station pollution

Region	Premature deaths	Years of life lost	Low birth weight babies	Type 2 diabetes
Sydney	153	1433	147	199
Central Coast	25	234	16	33
Lower Hunter*	51	477	37	63
Upper Hunter	7	65	6	8

* including Lake Macquarie

Health impacts each year from five NSW coal-fired power stations

Power station	Owner	Premature deaths	Years of life lost	Low birth weight babies	Type 2 diabetes
Bayswater	AGL	40	376	34	50
Liddell	AGL	27	250	22	34
Eraring	OriginEnergy	87	815	76	113
Vales Point	Delta Electricity	46	427	40	59
Mount Piper	Energy Australia	36	340	35	47

Health impacts between now and power stations' expected closure

Power station	Expected closure date	Remaining power station operation (years)	Premature deaths	Low birth weight babies	Type 2 diabetes
Bayswater	2035	17	685	571	857
Liddell	2022	4	107	89	134
Eraring	2032	14	1219	1058	1579
Vales Point	2030	12	547	475	709
Mount Piper	2042	24	871	835	1133
Total			3429	3029	4412

Publication date: November 2018

Source for all figures: Ewald B, The health burden of fine particle pollution from electricity generation in NSW, November 2018, available at www.envirojustice.org.au/healthstudynsw



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