

How coal burns Australia

The true cost of burning coal

Outline of key studies that calculate the true cost of coal.
The true cost means taking into account certain externalities
such as healthcare and pollution.

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The following are members of our Scientific Committee and support the work of
Doctors for the Environment Australia

Prof. Stephen Boyden AM; Prof. Peter Doherty AC; Prof. Bob Douglas AO; Prof. Michael Kidd AM;
Prof. David de Kretser AC; Prof. Stephen Leeder AO; Prof. Ian Lowe AO; Prof. Robyn McDermott;
Prof. Tony McMichael AO; Prof. Peter Newman; Prof. Emeritus Sir Gustav Nossal AC; Prof. Hugh Possingham;
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Professor David Yencken AO

The true cost of coal

Contrary to dominant views about the industry, coal-fired power is not the cheapest fuel and its value to the community is dubious. Yet this polluting industry continues to enjoy unjustifiable support.

Doctors for the Environment (DEA) has serious concerns about Australia's addiction to coal. The health impacts of mining, transporting and burning coal are well known and pose one of the most significant health issues of our time. The only rationale for using coal is that it is the cheapest source of energy ... But according to the research, it's not!

The total costs of coal mining, transport and burning need to be taken into account to understand the true cost of coal. These externalities include the healthcare costs of people affected by coal pollution, economic losses and environment damage to water sources, land and food production. Take into account the costs climate change and extreme weather events resulting from coal burning and the picture gets even worse. The externalities are rising rapidly in many countries including Australia.

All published studies indicate that the true cost of coal is much greater than the market price. There are no studies that contradict this view.

Ministers responsible for energy typically extol the virtue of cheap coal. However the real costs are passed on to the long-term budgets of other departments.

A CSIRO analysis details expectations that solar thermal with storage will compete with coal as early as 2016. reneweconomy.com.au/2012/csiro-to-lead-push-to-bring-cost-of-csp-to-10ckwh-83741

DEA believes that some forms of renewable energy are already much cheaper for energy production than coal. The CSIRO analysis does not take into account the externalities of coal. It is therefore possible that solar thermal is already cheaper than coal using full cost accounting. We believe the results would be similar with an analysis of unconventional gas. reneweconomy.com.au/2013/renewables-now-cheaper-than-coal-and-gas-in-australia-62268

The studies below describe the huge health cost of air pollution from coal combustion. These economic assessments do take into account the considerable subsidies to the coal industry.

It is vital that governments recognise the economic, health and environmental realities and act upon them. This is a problem that only a whole-of-government approach can address.

Key studies calculating true costs of coal

The findings of seven key studies by economic and health experts from the US, Europe and Australia illustrate the true cost of coal.

1. Environmental Accounting for Pollution in the US Economy

This paper published in August 2011 is from William Nordhaus one of the most respected economists in the US. It was the lead paper in *American Economic Review*, the leading economics publication, and the findings have not been contested by any other economists. The original text is quite technical but this precis is more easily understood.

The study presents a framework to include air pollution into a system of national accounts, ie. calculations of gross domestic product and other macroeconomic statistics. It estimates the value of air pollution damage created by several industries in the United States.

The impacts of six pollutants (sulphur dioxide [SO₂] nitrous oxide [NO_x], volatile organic compounds, ammonia, particles at less than 2.5 microns [PM_{2.5}], and particles less than 10 microns [PM_{10-2.5}]) are estimated on human health, agricultural yield, visibility, accelerated depreciation and human recreation. Air pollution concentrations are related to human illness and death and the economic loss estimated.

This is what the study found: Several industries cause damages greater than their "value added" - ie. the difference between the value of the inputs they take in and the value of the output they produce. Coal fired power generation was found to produce damages from 0.8 to 5.6 times its value added. In other words, the damage caused is worth at best 80 per cent of the net value of the industry and at worst 5.6 times greater.

pubs.aeaweb.org/doi/pdfplus/10.1257/aer.101.5.1649

These are remarkable findings which indicate at best that coal fired power generation has no economic value to the community. At worst the industry is a huge economic burden.

2. Full cost accounting for the life cycle of coal (US)

Paul R. Epstein, *Annals of the New York Academy of Sciences* 2009

The external costs of coal are calculated to add 18 cents per kilowatt hour to the price of electricity in the USA. This means the true cost may be as high as 27 cents per kilowatt hour.

"We estimate that the life cycle effects of coal and the waste stream generated are costing the U.S. public a third to over one-half of a trillion dollars annually. Many of these so-called externalities are, moreover, cumulative. Accounting for the damages conservatively doubles to triples the price of electricity from coal per kWh generated, making wind, solar,

and other forms of non-fossil fuel power generation, along with investments in efficiency and electricity conservation methods, economically competitive.” onlinelibrary.wiley.com/doi/10.1111/j.1749-6632.2010.05890.x/full

3. Hidden Costs of Energy; unpriced consequences of energy production and use

National Academies of Science USA

“Coal accounts for about half the electricity produced in the U.S. In 2005 the total annual external damages from sulphur dioxide, nitrogen oxides, and particulate matter created by burning coal at 406 coal-fired power plants, which produce 95 percent of the nation's coal-generated electricity, were about \$62 billion; these non-climate damages average about 3.2 cents for every kilowatt-hour (kWh) of energy produced. A relatively small number of plants - 10 percent of the total number - accounted for 43 percent of the damages. By 2030, non-climate damages are estimated to fall to 1.7 cents per kWh”.

nationalacademies.org/onpinews/newsitem.aspx?RecordID=12794

4. The unpaid health bill: How coal power plants make us sick (Europe)

In Europe the health cost of air pollution from coal-fired power stations is 42.8 billion Euros a year. This estimate takes into account the health costs resulting from particles less than 2.5 microns (PM_{2.5}), SO₂ and Nitrous oxide (NO_x) emissions only. There are 18,200 premature deaths, about 8,500 new cases of chronic bronchitis, and over 4 million lost working days each year due mainly to respiratory and cardiac disease.

env-health.org/news/latest-news/article/the-unpaid-health-bill-how-coal

5. The Hidden costs of electricity: Externalities of Power Generation in Australia (ATSE) 2009

The health burden of coal in Australia due to air pollution was estimated by the Australian Academy of Technological Sciences and Engineering to be \$2.6 billion per annum (or \$13 per megawatt hour)

scribd.com/doc/36842518/ATSE-Hidden-Costs-Electricity-report

6. Air Pollution Economics; Health Costs of Air Pollution in the Greater Sydney Metropolitan Region

The NSW Department of Environment and Conservation

The total health costs of annual emissions of common ambient air pollutants from all sources in the GMR from 2000 to 2002 were conservatively estimated to be between \$1 billion and \$8.4 billion per annum. This is equivalent to between 0.4 per cent and 3.4 per cent of gross state product.

environment.nsw.gov.au/resources/air/airpollution05623.pdf

This cost cannot be apportioned between electricity generation & other industrial pollution and vehicular pollution but an assumption of half and half distribution would be reasonable.

7. Health and Social harms of Coal Mining in Local Communities 2012

Ruth Colagiuri, Johanne Cochrane and Seham Girgis
Health and Sustainability Unit and The Boden Institute for Obesity,
Nutrition and Exercise, The University of Sydney
media.beyondzeroemissions.org/coal_health_Report_FINAL.pdf

All potential externalities were identified, but costs were not provided. This paper is included in this survey because it describes the range of harms identifiable in Australia.