Doctors for the Environment Australia:
The human health tolls of coal

Health

The burning of coal emits hazardous air pollutants, including particulate matter, sulphur dioxide, nitrogen oxides, carbon dioxide, mercury and arsenic.[1]

Research published in The Lancet estimates that 24 people die for every terrawatt (TWh) of coal combusted.[1] The International Energy Agency estimates that more than 7,500TWh of electricity was generated by burning coal in 2009.[2] According to this and other estimates,[3] the toll from coal-fired power generation globally exceeds 200,000 deaths annually. In a report published by the World Health Organization in 2008, it was estimated that particulate pollution from coal could be causing over 1 million premature deaths annually.[4]

Air pollution from coal contributes to four of the five leading causes of death in western society: lung cancer, respiratory disease, stroke and heart disease.[5]

An important study in the American Heart Association Journal Circulation in 2010[6] found that even short exposures to particulate matter (a few hours to weeks) can trigger cardiovascular deaths and illness, while longer-term exposure (over a few years) greatly increases the risk for cardiovascular mortality and reduces life expectancy by several months to a few years.[5]

In the USA it is estimated that over 23 000 people die prematurely every year because of coal burning.[7] A recent testimony by the US House Oversight Subcommittee on Energy Policy, Health Care, and Entitlements estimated the human health cost of coal fired electricity to be between $37 billion to $90 billion annually.[8]

Based on extrapolation from international studies, the air pollution health cost of coal burning in Australia is estimated at $2.6 billion annually.[9]

A recent study into the cost of the Hazelwood power station in Victoria, found that air pollution from Hazelwood causes approximately 18 deaths per year, around 1% of annual mortalities in Gippsland. Since Hazelwood is only one of several power stations in Gippsland, a higher proportion of deaths in the region are likely to be attributable to coal fired power stations.[10]

Climate Change

Climate change is widely regarded as the biggest health threat of the century, and the coal industry is the single biggest driver.[11,12,13] Australia has endorsed the global agreement to limit global warming to 2°C.

It is estimated that 80% of the world's known fossil fuel reserves must be left in the ground, including vast known reserves in Australia.[14]

If Australia were to mine all of its known coal reserves for burning, this country alone would be responsible for using up to 25% of the global carbon budget to limit global warming to 2°C.[15]

Economy

Australia has one of the most carbon intensive and polluting electricity supplies in the world, with around 80% of electricity generation coming from coal.[15]

Coal mining contributes comparatively little to the economy and jobs relative to other industries. In NSW for example, mining royalties account for only two per cent of the state budget, about as much as traffic fines and license fees.[16] Furthermore, the Australian Bureau of Statistics, and Reserve Bank data indicate mining often negatively impacts local employment in agriculture.[17, 18]

A ground breaking study published in the Annals of the New York Academy of Sciences found that if all the externalities of coal were taken into account, electricity prices would have to be doubled to offset the costs.[19] This report estimates health costs of $74.6 billion a year in Appalachian communities.

Similarly, the Hazelwood power station study in Australia found that if all externalities were taken into account, the true cost of coal-fired electricity from Hazelwood was $87/MWh. This was almost triple the wholesale price of electricity in Victoria for that period of $30/MWh. Therefore it was estimated Hazelwood power station imposes an external economic cost on Australians in the order of $900 million per year.[10]

A recent report by the Zurich-based UBS bank found that photovoltaic solar and wind generation are rapidly moving towards a competitive price for consumers. "By 2020 investing in a home solar system with a 20-year life span, plus some small-scale home battery technology and an electric car, will pay for itself in 6 to 8 years… The best newly built windfarms are selling power at the equivalent of 3p/kWh before subsidies, which neither gas, nor coal, nor nuclear power can match."[20]

Furthermore, studies in Australia have shown that Concentrated Solar Thermal power will prove to be an economically viable alternative to coal within a few years, if all of the externalities of coal are considered.[21]

Future Vision

By investing in renewable energy sources and rapidly transitioning from fossil fuels, we can save lives and improve health immediately due to improved local environments, prevent unmanageable climate change with its associated devastating health consequences, and make sound economic investments in Australia's future. The time to end our reliance on coal is now for the health of present and future generations.

References

1. Markandya, A., and Wilkinson, P. Energy and Health 2: Electricity generation and health, The Lancet, Sep 15-Sep 21, 2007; 370, 9591
2. International Energy Agency, Emissions From Fuel Combustion, IEA Statistics, 2011 edition, p.122. Available at: http://www.iea.org/media/statistics/co2highlights.pdf
3. Gohlke, J. Health, Economy, and Environment: Sustainable Energy Choices for a Nation, Environmental Health Perspectives. 2008 June; 116(6): A236–A237.
4. WHO (2008). Air quality and health. Geneva, World Health Organization. http://www.who.int/mediacentre/factsheets/fs313/en/index.html
5. Mannucci, P. M. Airborne pollution and cardiovascular disease: burden and causes of an epidemic, *European Heart Journal*, Editorial, published online, 19th February 2013.
6. Particulate Matter Air Pollution and Cardiovascular Disease. Circulation 2010; 121: 2331-2378. Robert D. Brook, MD; Sanjay Rajagopalan, MD; C. Arden Pope.
7. Air pollution and early deaths in the United States. Part I: Quantifying the impact of major sectors in Atmospheric Environment 79 (2013) 198e208. http://lae.mit.edu/wordpress2/wp-content/uploads/2013/08/US-air-pollution-paper.pdf
8. D. Weiss. Testimony on "The Effects of Rising Energy Costs on American Families and Employers" Energy Policy, Healthcare, and Entitlements Subcommittee of the Committee on Oversight and Government Reform. February 14, 2013. Available at: http://oversight.house.gov/wp-content/uploads/2013/02/Weiss-Testimony-Feb-14-2013-COMPLETE.pdf
9. The hidden Costs of Electricity: Externalities of Power Generation in Australia. ATSE March 2009.
10. Cleaning up Victoria's Power Sector: the full social cost of Hazelwood power station. Harvard Kennedy School of Government. February 24th 2015
11. UCL Climate change: The biggest global-health threat of the 21st century. Available at: http://www.ucl.ac.uk/news/news-articles/0905/09051501
12. WHO Climate change and human health. Available at: http://www.who.int/globalchange/en/
13. The Lancet: Managing the Health Effects of Climate Change. Available at: http://www.thelancet.com/commissions/climate-change
14. Unburnable Carbon 2013: Wasted capital and stranded assets. Available at: http://www.climateinstitute.org.au/unburnable-carbon.html
15. Geoscience Australia: Coal Resources. Available at: http://www.ga.gov.au/scientific-topics/energy/resources/coal-resources
16. The Australia Institute. Seeing through the dust: Coal in the Hunter Valley. Available at: http://www.tai.org.au/
17. RBA. The Effect of the Mining Boom on the Australian Economy. August 2014. Available at: http://www.rba.gov.au/publications/rdp/2014/pdf/rdp2014-08.pdf
18. ABS. A Review of Selected Regional Industrial Diversity Indexes, 2011. Available at: http://www.abs.gov.au/ausstats/abs@.nsf/mf/1381.0.55.001?OpenDocument
19. R. Epstein. Full cost accounting for the life cycle of coal. Ann. N.Y. Acad. Sci. 1219 (2011). New York Academy of Sciences.
20. UBS Investors. http://www.theguardian.com/environment/2014/aug/27/ubs-investors-renewables-revolution
21. Repower Port Augusta: a solar future for South Australia. https://bze.org.au/our-publications/repowering-port-augusta

June 2015

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Healthy planet, healthy people

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