COAL'S TOLL ON HEALTH

FACT SHEET

Each step of the coal to energy generation lifecycle - mining, transportation, washing, combustion, and disposing of waste - impacts upon human health *(Epstein, 2011)*.

COAL POLLUTES OUR AIR

Coal mining is associated with chronic health problems among miners, such as black lung disease, and communities near coal mines may be adversely affected by blasting and dust *(Lockwood et al., 2009)*. Transportation of coal via trains and trucks also releases coal dust.

The burning of coal emits hazardous air pollutants, including particulate matter, sulphur dioxide, nitrogen oxides, mercury and arsenic, as well as carbon dioxide into our atmosphere *(Castleden et al., 2011)*.

These air pollutants contribute to the leading causes of death in our society: heart disease, stroke, respiratory disease and lung cancer *(Mannucci, 2013)*. Coal pollutants can affect lung development in children and trigger asthma attacks *(Perera, 2008)*.

Short term exposures to particulate matter can trigger cardiovascular events including heart attacks and illness *(Brook et al., 2010; Nawrot et al., 2011)*, while longer-term exposure even at the low levels within the current national guidelines can increase the risk for cardiovascular mortality and reduced life expectancy *(Mannucci, 2013)*.

In the USA, air pollution from only part of the coal energy cycle (the release of small particulates, $PM_{2.5}$, and ozone from combustion) is estimated to contribute to over 54,000 premature deaths every year *(Caiazzo et al., 2013)*. In China, the burning of coal has been identified as the single largest source of air pollution-related health impact, contributing to 366,000 premature deaths in 2013 *(Health Effects Institute, 2016)*.

Recently published data from *The Lancet* showed an increase in global deaths from fine particulate air pollution, of which coal is a major source, from about 3.5 million in 1990 to 4.2 million in 2015 *(Cohen, 2017)*.

A multi-country study examining the public health implications of electricity and coal consumption found that increased electricity consumption in countries with an infant mortality < 100/1,000 births does not lead to greater health benefits and that coal consumption has significant detrimental health impacts (Gohlke et al., 2011).

A testimony by the US House Oversight Subcommittee on Energy Policy, Health Care, and Entitlements estimated the human health cost of coal-fired electricity in that country to be between US$37 billion to US$90 billion annually *(Weiss, 2013)*. Based on extrapolation from international studies, the air pollution health cost of coal burning in Australia is estimated at A$2.6 billion annually *(Australian Academy of Technology and Engineering, 2009)*.

A MAJOR DRIVER OF CLIMATE CHANGE

Climate change is widely regarded as the biggest health threat of the century, and the coal industry is the single biggest driver *(Costello et al., 2009; Watts et al., 2015; World Health Organization, 2015)*. 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 if warming is to be limited to 2°C *(McGlade and Ekins, 2015)*. For Australia to play its part in tackling climate change, over 90% of coal reserves must remain unburnt and no new mines developed *(Climate Council 2017; McGlade and Ekins, 2015)*. If Australia was to mine and burn all of its known coal reserves, this country alone would be responsible for using up to 25% of the remaining global carbon budget *(Australian Government, Geoscience Australia)*.

FALSE ECONOMICS

Australia has one of the most carbon intensive and polluting electricity supplies in the world, with around 80% of electricity generation coming from coal *(Australian Government, Geoscience Australia)*.

Mining contributes comparatively little to employment relative to other industries. It accounts for less than 2% of employment in Australia *(Parliament of Australia, 2016)* and often negatively impacts local employment in agriculture *(Reserve Bank of Australia, 2014)*. As the mining sector becomes increasingly automated, it is likely that it will employ even fewer people.

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, American electricity prices would have to be doubled to offset the costs *(Epstein et al., 2011)*.

Similarly, an economic assessment of the decommissioned Hazelwood power station in Australia found that if all externalities were considered, the true cost of coal-fired electricity from Hazelwood was A$87/MWh. This was almost triple the wholesale price of electricity in Victoria for that period. It was therefore estimated that Hazelwood imposed an external economic cost on Australians in the order of A$900 million per year *(Ward and Power, 2015)*.

Global fossil fuel energy subsidies – the difference between what consumers should be paying for fossil fuel to cover supply costs, environmental costs and general consumption taxes, and what they actually pay – have been estimated at US$5.3 trillion for 2015, or 6.5% of global GDP *(Coady et al., 2017)*.

In contrast, the cost of electricity from renewable sources is rapidly declining *(Clean Energy Council, 2016)*. The result is that energy from renewable sources is now cost-competitive or cheaper than energy derived from fossil fuels in most world regions (*IRENA 2016; Climate Council 2017*). Significantly the global costs of wind and solar are expected to continue falling, possibly by as much as 59% and 43% for solar photovoltaics and concentrated solar power respectively and 26% for on-shore wind by 2025 *(IRENA, 2016)*.

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Healthy planet, healthy people

These cost comparisons would further favour renewable energy generation if the hidden costs of coal to health and the environment (externalities) were considered.

In Australia, large scale solar plants and onshore wind generation are now cheaper than new coal-fired plants *(Clean Energy Council, 2016)*. Employment in the renewable energy industry is predicted to increase substantially in 2017, with over 35 large-scale projects already under construction or starting: representing A$7.5 billion in investment and 4,100 additional direct jobs *(Clean Energy Council, 2016)*.

CLEAN ENERGY: THE HEALTHY ALTERNATIVE

By investing in renewable energy sources and rapidly transitioning from fossil fuels, we can save lives and improve health immediately.

We can also improve local environments, reduce the risks of unmanageable climate change with its devastating health consequences, and make sound economic investments in Australia's future.

Coal is an unhealthy fuel of the past and it is time to look to healthier, more sustainable alternatives.

RELATED DEA FACT SHEETS

- Adani's Carmichael Coal Mine and Health **https://www.dea.org.au/wp-content/uploads/2017/05/DEA-Adani-Long-Fact-Sheet_final.pdf**
- Climate Change and Health in Australia **https://www.dea.org.au/wp-content/uploads/2017/02/DEA_Climate_Change__Health_Fact_Sheet_final.pdf**

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