

Health Highlights: Pembina Institute Report – Out with the Coal, In with the New

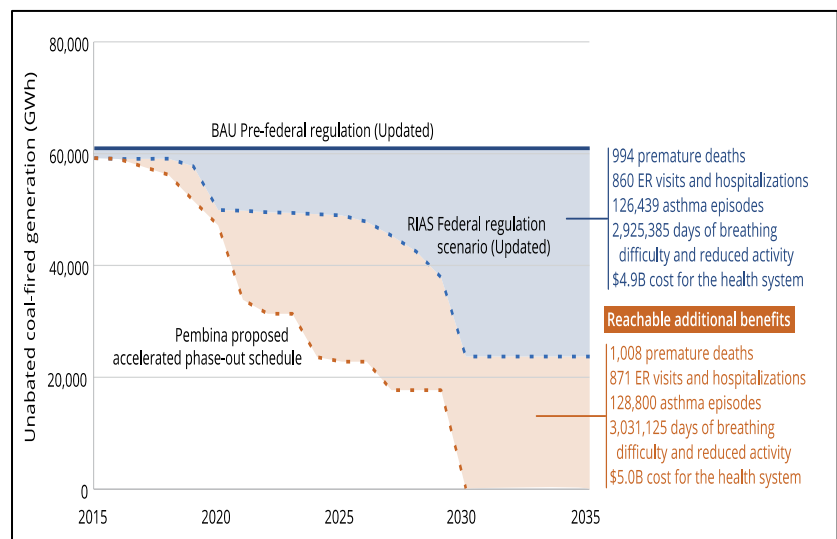
Coal, Air Pollution & Human Health

The Pembina Institute, in collaboration with ten health organizations and four environmental organizations, has released a new report, ***Out with the coal, in with the new: National benefits of an accelerated phase-out of coal-fired power***, which estimates the air pollution-related health benefits associated with a Canada-wide phase-out of coal-fired power plants by 2030.

Coal-fired power plants are a significant source of air pollution. There are 14 coal plants located in four provinces: Alberta, Saskatchewan, Nova Scotia, and New Brunswick. In 2015, nine of these plants were among the top 13 sources of sulphur dioxide (SO₂) emissions in Canada, while 10 were among the top 13 sources of nitrogen oxides (NO_x). SO_x and NO_x, which are harmful pollutants themselves, can also become fine particulate matter (PM2.5) and ground-level ozone in the atmosphere. PM2.5 is the air pollutant that has been most clearly linked to chronic heart and lung diseases, while ozone is the air pollutant that most frequently triggers smog advisories in Canada.

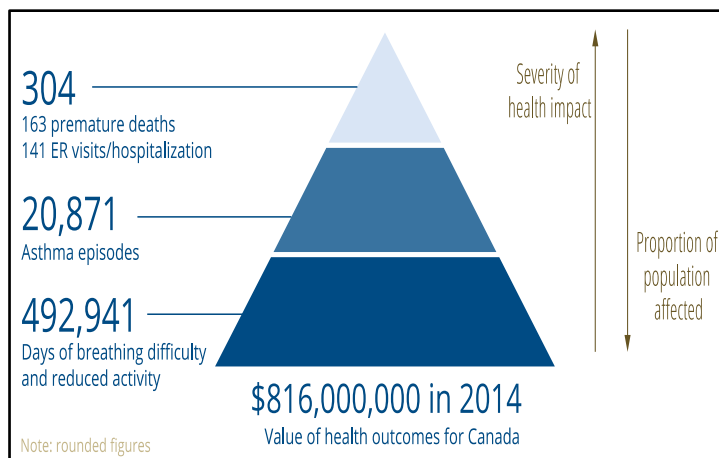
The accelerated closure of these coal plants will produce immediate and significant health benefits for Canadians. The air pollutants associated with coal plants have been clearly and consistently linked to chronic heart and lung diseases including lung cancer and asthma, and acute heart and lung ailments that result in premature deaths, hospital admissions, and emergency room visits. The very young, the elderly, and those with pre-existing health conditions, such as asthma, are the ones most at risk. More recently, these air pollutants have been associated with adverse birth outcomes, the development of cognitive disorders, and increased rates of diabetes.

In 2012, Environment Canada conducted a cost-benefit analysis, known as the Regulatory Impact Analysis Statement (RIAS), on federal coal regulations designed to limit the rate of carbon dioxide emissions from coal plants or require their closure after 50 years of operation. Using the Air Quality Benefits Assessment Tool (AQBAT) developed by Health Canada, Environment Canada estimated that improved air quality resulting from the regulations would prevent approximately 994 premature deaths and 860 hospital admissions or emergency room visits between 2015 and 2035. **These avoided health outcomes were valued at \$4.9 billion.**



To determine the additional air pollution-related health benefits associated with a 2030 coal plant phase-out, Pembina extrapolated the RIAS results at a regional level and corrected for the carbon capture and storage (CCS) technology used in Saskatchewan. **Doing so, it estimated that a 2030 phase-out would nearly double the health benefits associated with the existing coal regulations**, preventing an additional 1,008 premature deaths and 871 hospital admissions or emergency room visits between 2015 and 2035. **These additional health benefits were valued at nearly \$5 billion.** Most of these benefits are expected in the prairies because of the heavy use of coal plants in Alberta and Saskatchewan, but substantial benefits are also expected in Atlantic Canada and central Canada.

Pembina found that coal-fired power plants across Canada were responsible for approximately 163 premature deaths and 141 hospital admissions or emergency room visits in 2014 alone. **These health outcomes, along with other related impacts, were valued at approximately \$816 million.**



Coal, Mercury & Human Health

Coal plants are also a significant source of mercury, a persistent toxic substance that accumulates in the aquatic food chain. Coal-fired power is presently responsible for 18% of the country's mercury emissions from human activities. Prenatal and early-life exposure to mercury, resulting from the consumption of mercury-contaminated fish, has been linked to adverse developmental impacts such as reductions in cognitive abilities and motor skills. A study of lifelong losses in IQ and productivity, resulting from prenatal mercury exposures to emissions from American coal plants, found that these health impacts cost Americans \$1.3 billion per year.

In 2012, Environment Canada estimated that mercury releases avoided between 2015 and 2035 by the updated coal regulations would produce health benefits valued at \$26 million in Canada. Environment Canada noted that these costs were limited to the developmental impacts associated with mercury and did not reflect new evidence which suggests that mercury may also be connected to heart disease and premature deaths. **Pembina estimates that a more comprehensive assessment of mercury's impacts on health would place produce health benefits in the range of \$1.3 billion for compliance with the updated regulations.**

Coal, Climate Change & Human Health

Coal power plants are heavy emitters of greenhouse gases. In 2014, they were responsible for approximately 8.5% of Canada's GHG emissions. They make up half of Canada's top emitters of greenhouse gases and they are among the top greenhouse gas emitters in Alberta, New Brunswick, Nova Scotia, and Saskatchewan.

Climate change presents a significant threat to public health around the world. In 2009, U.K. medical journal *The Lancet* concluded that climate change may be the "biggest global health threat of the 21st century". The World Health Organization estimates that, between 2030 and 2050, climate change will produce at least 250,000 additional deaths each year: 38,000 from heat exposure among elderly people, 48,000 due to diarrhea, 60,000 from malaria, and 95,000 from childhood under-nutrition. Children and the elderly will be the hardest hit by climate change, as will island countries and those countries struggling to feed their populations at present.

Read the full report at <http://www.pembina.org/pub/out-with-coal>