



Canadian Association of  
**Physicians**  
for the  
**Environment**

THE  LUNG ASSOCIATION™  
Alberta & NWT

  
Asthma Society of Canada

**Submission to  
Alberta's Climate Change Advisory Panel**

**Submitted by  
Canadian Association of Physicians for the Environment (CAPE)  
&  
The Lung Association of Alberta & Northwest Territories  
&  
Asthma Society of Canada**

**Kim Perrotta, Executive Director, CAPE &  
Leigh Allard, President & CEO, The Lung Association, AB & NWT  
Noah Farber, Acting President & CEO, Asthma Society of Canada  
Dr. Joe Vipond, Dr. Bob Dickson & Dr. Raquel Feroe, CAPE members**

**September 18, 2015**

## Who Are We?

The **Canadian Association of Physicians for the Environment (CAPE)** is a national, non-profit organization that works to promote human health by protecting the environment. We have approximately 6,000 members across the country and are directed by a Board composed mostly of physicians. For 22 years, we have been conducting research, education and advocacy on environmental health issues.

**The Lung Association** has led the fight for healthy lungs and healthy air for close to 100 years. The Lung Association works to save lives, prevent and improve lung health through research, advocacy, education and support. When you can't breathe... nothing else matter.

The **Asthma Society of Canada** is a national charitable volunteer-supported organization devoted to enhancing the quality of life and health for people living with asthma and associated allergies through education, research and advocacy. We have a 41-year reputation of providing health education services to patients and healthcare professionals.

For three years, CAPE, The Lung Association of AB & NWT, and the Asthma Society of Canada have been conducting research, education and advocacy in support of a phase-out of coal-fired power plants in Alberta, in collaboration with Public Interest Alberta. We have been doing so because coal plants present a triple threat to human health. Coal is a rich source of greenhouse gases that contribute to climate change, common air pollutants that are known to harm human health, and mercury - a persistent and toxic metal that harms the central nervous system of humans.

## Health Threat #1 – Air Pollution

In 2011, Alberta's six coal plants were responsible for 33 per cent of the sulphur dioxide, 10 per cent of the nitrogen oxides, and 6 per cent of the fine particulate matter emitted into Alberta's air (Pembina, 2013). These air pollutants, and the air pollutants created in the atmosphere from them, are the common air pollutants that have been clearly and consistently linked to premature deaths, hospital admissions, and emergency room visits for conditions such as congestive heart failure, strokes, chronic obstructive pulmonary disease (COPD) and asthma (WHO, 2013). These air pollutants have also been shown to increase the rates of chronic heart and lung diseases, including lung cancer and asthma, among the general population (WHO, 2013).



*Photo: W. Kozielczyk, Thinkstock 1*

In 2009, using the Illness Cost of Air Pollution (**ICAP**) model, the Canadian Medical Association estimated that air pollution in Alberta was producing adverse health impacts valued at approximately \$549 million

per year. Working with our partners and the Pembina Institute, and employing the same model, we estimated that, each year, air pollution from coal-fired power plants were giving rise to approximately:

- 100 premature deaths from long-term exposures;
- 700 visits to Alberta’s emergency departments and 80 hospital admissions for respiratory and cardiovascular ailments from short-term exposures; and
- 4,800 asthma symptom days from short-term exposures.

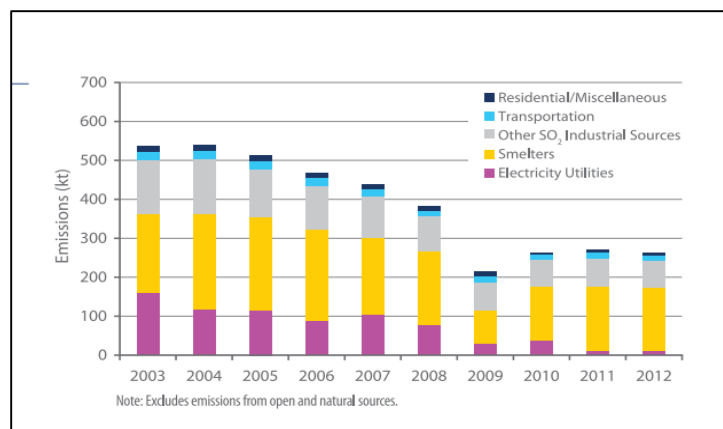
The ICAP model valued these health impacts at approximately **\$300 million per year or \$3 billion when extrapolated over a 10 year period** (Pembina 2013).

Policy changes can and do improve air quality. Ontario, which phased out its coal-fired power plants between 2003 and 2015, has seen significant improvements in its air quality. As indicated in Table 1, by phasing out Ontario’s coal plants, the Ontario Government was able to remove over 147,000 tonnes of sulphur dioxide and 42,000 tonnes of nitrogen oxides from Ontario’s airshed between 2003 and 2015.

**Table 1: Emissions from Ontario’s Five Coal-Fired Power Plants, 2001 (OPHA, 2002)**

Plants	Sulphur Dioxide (tonnes)	Nitrogen Oxides (tonnes)	Mercury (kg)	Carbon Dioxide (tonnes)	Year of Closure
Nanticoke	86,500	22,400	246.6	20,260,000	2013
Lambton	28,300	11,800	135.0	9,420,000	2013
Lakeview	19,000	5,050	83.2	2,760,000	2005
Thunder Bay	8,810	1,970	67.1	1,880,000	2014
Atikokan	4,480	950	63.0	850,000	2012
Total	147,090	42,170	629.9	35,170,000	

Figures 1, 2 and 3, drawn from the most recent air quality report produced by the Ontario Ministry of the Environment and Climate Change, illustrate how the downward trend in emissions of sulphur dioxide from Ontario’s coal plants from 2003 to 2012 (Figure 1), is reflected in the downward trend in annual air levels of sulphur dioxide (Figure 2) and fine particulate matter (Figure 3) in Ontario from 2004 to 2013 (OMOE, 2014).



*Figure 1: Annual Emissions of Sulphur Dioxide, Different Sectors, Ontario, 2003-2012 (OMOE, 2014)*

These improvements in Ontario’s air quality have translated into significant health benefits for Ontario residents. In 2014, Toronto Public Health reported that significant improvements in Toronto’s air quality has produced dramatic reductions

in air pollution-related health impacts for residents of Toronto. Between 2000-2011, annual air levels of fine particulate matter (PM<sub>2.5</sub>) in Toronto decreased by 30%, while air levels of sulphur dioxide decreased by 79% and air levels of nitrogen dioxide decreased by 36% (TPH, 2014). These improvements have reduced air pollution-related premature deaths in Toronto by 23% from 1,700 in the year 2000 to 1,300 in 2010. They have reduced air pollution-related hospital admissions by 41% from 6,000 in the year 2000 to 3,550 in 2010 (TPH, 2014).

In other words, each year, 400 fewer people in Toronto are dying and 2450 fewer people are being hospitalized because of improvements in its air quality. Toronto Public Health attributes these air quality improvements to the phase out of coal plants in Ontario and south of the border, and other measures taken by the federal, provincial and municipal governments over the last 15 years (TPH, 2014).

## Health Threat #2 - Mercury

In 2011, Alberta's coal plants emitted 44 per cent of the mercury that was released from human activities in the province (Pembina, 2013). Mercury is a persistent toxic substance that accumulates in the aquatic food chain (CCME, 2005). 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 (CCME, 2005). Researchers have attributed 3.2 per cent of mental retardation cases in the United States to mercury exposure and valued these excess cases at **\$2.0 billion per year** (Trasande et al., 2006). Women of childbearing age, pregnant women, children, and populations who depend on fish as a traditional food source, are at greatest risk from mercury (CCME, 2005).

## Health Threat #3: Climate Change

In 2011, Alberta's six coal plants were responsible for about 18% of the greenhouse gases (GHG) emitted in the province or about 44 megatonnes (MT) (Pembina, 2013). While many think of climate change as an environmental problem, among many health professionals, climate change is seen as the most significant public health challenge of our generation. Climate change affects many of the social and

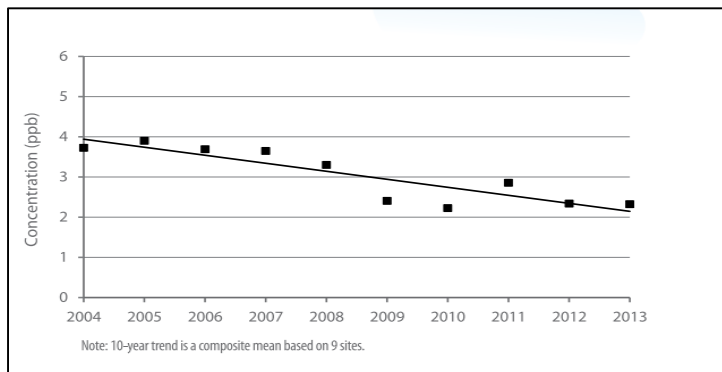


Figure 2: Annual Air Levels of Sulphur Dioxide, Selected Sites, Ontario, 2004-2013 (OMOE, 2014)

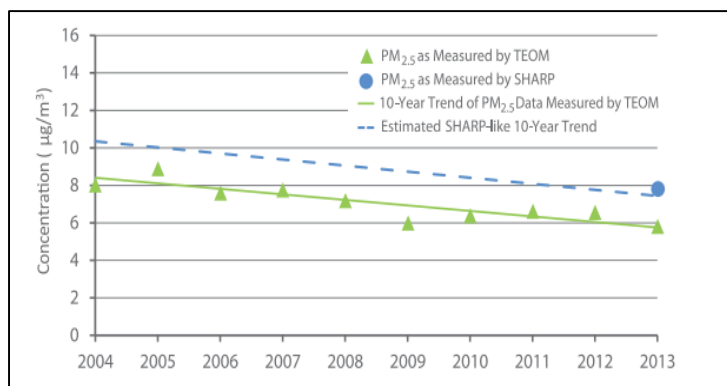


Figure 3: Annual Air Levels of Fine Particulate Matter, Selected Sites, Ontario 2004-2013 (OMOE, 2014)

environmental determinants of health such as air quality, air temperatures, availability and quality of drinking water, availability of food supplies, the range of infectious diseases, and housing.

The World Health Organization has estimated that, between 2030 and 2050, climate change will produce 250,000 additional deaths each year: 38,000 due to heat exposure in elderly people; 48,000 due to diarrhoea; 60,000 due to malaria; and 95 000 due to childhood under-nutrition (WHO). While countries with poor health infrastructure and low incomes will be the hardest hit (WHO, 2014), Canada will not be immune.

In Alberta, it is expected that climate change will: increase the frequency and severity of heat waves; produce higher levels of smog and pollen as temperatures increase; increase the frequency and severity of thunderstorms, droughts, hailstorms, wildfires and tornadoes; increase the risks of avalanches and mudslides in the mountains; and produce heavier rainfall events which can lead to floods, contaminated drinking water, food-borne illnesses and other intestinal diseases (Health Canada, 2005).

These changes can be associated with significant economic impacts as well as health impacts. For example, the heavy rainfall that resulted in catastrophic flooding in several communities in Alberta in 2013, displaced more than 100,000 people, and resulted in costs estimated to exceed \$5 billion (Canada 2014).



*Photo: 51Systems, Thinkstock 1 1*

## **Actions Needed**

While other jurisdictions within Canada have been moving to reduce or eliminate their reliance on coal for the generation of electricity, Alberta has increased its coal-generated capacity. Today, Alberta uses more coal than all of the other provinces in the country combined. While there are other measures that can be taken within Alberta to reduce greenhouse gas emissions, few can provide the significant volume of reductions required as quickly as the phase-out of coal plants, and few will provide the dramatic health co-benefits that are associated with a phase-out of coal plants.

Air pollution, climate change, and the contamination of the aquatic food supply; these are the legacies of coal-fired power plants. These six plants are costing hundreds of millions each year in air pollution-related health impacts. It is likely that they have produced mercury-related health impacts worth millions of dollars each year. And they are contributing to climate change which has been costing Albertans billions of dollars in lost time, infrastructure and emergency response funds. There are

alternatives. Jurisdictions around the world are moving to phase-out the use of coal; displacing it with programs and policies directed at energy conservation and energy efficiency; and replacing it with renewable energies such as wind turbines and solar technologies that are becoming increasingly cost competitive. It is time for the Province to invest in the future; to cultivate a new energy sector that is carbon-free.

We recommend that the Alberta Government:

- Phase-out the use of coal-fired power plants as soon as possible and by 2025 at the very latest;
- Achieve this phase-out without re-investing in natural gas plants;
- Establish the mechanisms and programs needed to incent the rapid development of renewable energies;
- Establish the regulations, codes, funding and programs needed to encourage energy conservation and energy efficiency; and
- Work with the industry to ensure an orderly phase-out of plants and the fair treatment of workers displaced from their jobs.

For more information on the health impacts associated with air pollution and climate change, see the following background documents:

- [CAPE Background: Alberta Coal Plants, Air Quality & Human Health](#)
- [CAPE Background: Alberta Coal Plants, Climate Change & Human Health](#)
- [A Costly Diagnosis: Subsidizing coal power with Albertans' Health](#)

For more information on the strategies and mechanism that can be employed to phase-out coal plants, see the following background document:

- [CAPE Background: Phasing Out Alberta's Coal Plants](#)

## References:

Canadian Council of Ministers of the Environment (**CCME**). 2005. Canada-Wide Standards for Mercury Emissions from Coal-Fired Electric Power Generation Plants (2006).

Canadian Medical Association (CMA). 2008. No Breathing Room – The National Illness Costs of Air Pollution. [http://mysunshinecoast.ca/uploads/cleanairsociety/CMA\\_ICAP\\_sum\\_e.pdf](http://mysunshinecoast.ca/uploads/cleanairsociety/CMA_ICAP_sum_e.pdf)

Government of Canada (Canada). 2014. Canada's Sixth National Report on Climate Change. Actions to Meet Commitments Under the United Nations Framework Convention on Climate Change.

Health Canada. 2005. Human Health in a Changing Climate. Prepared by Elaine Barrow and Ge Yu, Climate Scenarios for Alberta (Prairie Adaptation Research Collaborative and Alberta Environment, 2005) 14.[http://www.parc.ca/research\\_pub\\_scenarios.htm](http://www.parc.ca/research_pub_scenarios.htm)

Intergovernmental Panel on Climate Change (**IPCC**). 2013. Intergovernmental Panel on Climate Change Summary for Policymakers Climate Change 2013. The Physical Science Basis Working Group I Contribution to the Fifth Assessment Report.

Ontario Ministry of the Environment and Climate Change (**OMOE**). 2014. Air Quality in Ontario 2013 Report.

Ontario Public Health Association (**OPHA**). 2002. Beyond Coal: Power, Public Health and the Environment. Prepared by Kim Perrotta.

Pembina Institute, Canadian Association of Physicians for the Environment, Asthma Society of Canada and The Lung Association Alberta and NWT (Pembina). 2013. A Costly Diagnosis: Subsidizing coal power with Albertans' health.

Toronto Public Health (**TPH**). 2014. Path to Healthier Air: Toronto Air Pollution Burden of Illness Update. Technical Report.

Trasande, L, C Schechter, K.A. Haynes, P.J. Landrigan. 2006. "Applying Cost Analyses to Drive Policy that Protects Children," *Annals of the New York Academy of Sciences*, 1076 (2006): 911.

World Health Organization (**WHO**). 2013. Review of evidence on health aspects of air pollution – REVIHAAP Project.

World Health Organization (**WHO**). 2014. Climate Change and Health webpage. August 2014. <http://www.who.int/mediacentre/factsheets/fs266/en/>.