Canadian Association of Physicians for the Environment

Backgrounder:

Alberta Coal Plants, Climate Change & Human Health

Climate change is one of the most significant public health challenges of our generation. In 2007, the Intergovernmental Panel on Climate Change (**IPCC**) issued a report in which it confirmed, with 90 per cent certainty, that the world's climate is warming and that this warming is being caused by human activity (IPCC, 2007).

Reliance on Coal Plants in Alberta

- Coal-fired power plants are one of the major sources of greenhouse gases (GHG).
- Alberta burns more coal for electricity than the rest of Canada combined.
- In 2014, the Province generated 68 per cent of its electricity from coal.
- Alberta saw a 14 per cent increase in its coal-generated electricity capacity from 2002 to 2012.
- It has six coal plants with 18 generators.
- The generating capacities for each range from 150 megawatts (**MW**) to 495 MW.
- They have a combined capacity of over 6,200 MW. (Pembina, 2013)

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Greenhouse Gases from Alberta Coal Plants

- In 2011, Alberta's six coal plants emitted about 18% of the total greenhouse gases (GHG) emitted in the province or about 43 megatonnes (MT).
- This is as much as all of the oil sands operations in Alberta combined. (Pembina, 2013)

How is Canada's Climate Changing?

- In 2015, the Federal Government reported that:

- The annual average air temperature in Canada has warmed by about 1.7°C between 1948 and 2012 (about twice as much as the global average);
- While average temperatures are rising across the country, stronger trends are found in the north and west, particularly during the winter and spring;
- Northern Canada has been warming at a rate that is two-and-a-half times greater than the global average since the late 1940s; and
- Generally speaking, Canada receives more rain that it used to and Southern Canada (south of 60° latitude) now receives less snow and more rain than it used to (Canada, 2014).

- Increases in temperature and changing patterns of precipitation have resulted in:
  - Reduced Arctic ice cover and increased depth and extent of permafrost thaw;
  - Decreased quality and duration of northern ice roads;
  - Changes in the amount of surface water that is available and lower water levels in the Great Lakes;
  - Increased loss of forests due to pests and wildfires;
  - More frequent droughts and flooding; and
  - Increased risks from foodborne diseases (Canada, 2014).

Climate's Impact on Human Health

- Climate change affects the social and environmental determinants of health – it affects air quality, drinking water, food supplies and housing.
- While it may bring some localized benefits, such as fewer winter deaths in cooler countries and increased food production in some regions, the overall health effects are likely to be overwhelmingly negative (WHO, 2014).
- Between 2030 and 2050, climate change is expected to result in approximately 250,000 additional deaths per 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).
- Countries with poor health infrastructure will be the hardest hit. (WHO, 2014)

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Extreme Heat & Air Pollution

- Extremely high air temperatures contribute to deaths from cardiovascular and respiratory disease, particularly among elderly people (WHO, 2014).

- During the 2003 heat wave in Europe, more than 70,000 excess deaths were recorded (Robine et al., 2008).
- High temperatures also increase air levels of ozone and other pollutants that aggravate cardiovascular and respiratory diseases (WHO, 2014).
- Extreme heat also tends to increase levels of pollen and other airborne allergens which can trigger asthma symptoms (WHO, 2014).

Extreme Weather Events

- Globally, the number of reported weather-related natural disasters has more than tripled since the 1960s. Every year, these disasters result in over 60,000 deaths, mainly in developing countries (WHO, 2014).
- Rising sea levels and increasingly extreme weather events are expected to destroy homes and other essential services along coastal areas. More than half of the world's population lives within 60 km of the ocean (WHO, 2014).

Photo: K Perrotta, Dundas, Ontario

- Increasingly variable patterns of rainfall are likely to affect the availability of fresh water which increases the risk of disease, drought, and famine (WHO, 2014).
- Floods, which are also increasing in frequency and intensity, can contaminate freshwater supplies, increase the risk of water-borne diseases, and create breeding grounds for insect-borne diseases. They also lead to drowning, physical injuries, damaged homes, and disruptions in health services (WHO, 2014).

Community Food Security

- Increasing temperatures and changing patterns of precipitation are expected to decrease the production of staple foods in many of the poorest regions (Hales et al, 2002).
- These changes will increase malnutrition and under-nutrition which currently contributes to approximately 3.1 million deaths every year (WHO, 2014).

Infectious Diseases

- Climatic conditions strongly affect water-borne diseases and diseases transmitted by insects, snails, and other animals (WHO, 2014).

- Climate changes are expected to lengthen the transmission seasons of important animal-borne diseases and to alter their geographic range (WHO, 2014). For example:
  - It is predicted that the area of China affected by the snail-borne disease schistosomiasis will widen greatly with climate change (Zhou et al., 2008);
  - The number of malaria cases, which currently kills almost 800,000 people every year (mainly African children under 5 years in age), will be affected (WHO); and
  - Studies suggest that an additional 2 billion people could be exposed to Dengue Fever, which is also transmitted by mosquitoes, because of climate change (WHO).

Climate Change's Impact on the Health of Albertans

- In Alberta, it is expected that climate change will:
  - Increase the frequency and severity of heat waves giving rise to heat-related health impacts;
  - Result in higher levels of smog and pollen as temperatures increase;
  - Increase the frequency and severity of thunderstorms, hailstorms, and tornadoes;
  - Increase the risk of avalanches and mudslides in the mountains; and
  - Produce heavier rainfall events which can lead to contamination of drinking water from run-off and leaching, resulting in outbreaks of waterborne and foodborne diseases (Health Canada, 2005).
- These changes can be associated with significant health and economic 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 that likely exceeded $5 billion (Canada 2014).

Photo: 51Systems, Thinkstock 1

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For more information, see CAPE Website.