Electricity and Combustion Division
Energy and Transportation Directorate
Department of the Environment
351 Saint-Joseph Boulevard, 11th Floor
Gatineau, Quebec K1A 0H3
Ec.electricite-electricity.ec@canada.ca

April 17, 2018

Re: Comments on the *Canada Gazette* Part I, Vol. 152, No. 7 — February 17, 2018, Regulations Amending the Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations. Statutory authority *Canadian Environmental Protection Act, 1999*

Introduction

These comments are being offered on behalf of the Canadian Association of Physicians for the Environment (**CAPE**), The Lung Association, Asthma Canada, the Canadian Public Health Association (**CPHA**), the Registered Nurses' Association of Ontario (**RNAO**), the Canadian Nurses for Health and the Environment (**CNHE**), the Saskatchewan Public Health Association (**SPHA**), the Ontario Public Health Association (**OPHA**), Upstream, and the Canadian Coalition for Green Health Care. As a submission from organizations that represent health care, public health, and health promoting professionals, we would like to reiterate and clarify our health interests in the proposed Regulations Amending the

Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations (**Coal Regulations**).

General Comments

We strongly support the move to phase-out coal plants across Canada by 2030. However, we feel strongly that equivalency agreements and exemptions for carbon capture and storage technology must provide Canadians, and the ecosystems in each province, protection from criteria air contaminants and mercury that is equivalent to that provided with a true phase-out of coal plants.

Background – Health Arguments

Climate change is the most significant public health challenge of our generation. Climate change affects many of the social and environmental factors that shape health, including air quality, air temperature, security and quality of drinking water, security of food supplies, the range of insect-borne diseases, and the security of housing and transportation systems.

The World Health Organization (**WHO**) has declared climate change "the greatest threat to global health in the 21st century" (WHO, 2016). It has estimated that, between 2030 and 2050, climate change will produce 250,000 additional deaths each year: 38,000 due to heat exposure among elderly people; 48,000 due to diarrhea; 60,000 due to malaria; and 95 000 due to childhood under-nutrition (WHO 2014a). 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.

Climate change is the ultimate health equity and social justice issue. Countries with poor health infrastructure and low incomes that are already struggling to feed their residents are the hardest hit by climate change, while countries with the highest standards of living, such as Canada, are among the largest emitters of the greenhouse gases that are contributing to climate change.

But Canadians will not be unaffected. Over the last two decades, Canadian have felt the impacts of climate change first hand with floods, mudslides, droughts, ice storms, wildfires, hurricanes, tornados, and heat waves that are occurring with greater frequency and/or intensity. Canada's subarctic and arctic is seeing rapid change, leaving communities struggling with melting permafrost, unreliable ice roads, mental health impacts and decreased access to traditional foods. Many Indigenous people in the north and in other parts of Canada maintain a strong connection to the land and participate in traditional and subsistence activities such as hunting, fishing and gathering animal and plant species, making them particularly vulnerable to changes in their local environment. These changing climate patterns and extreme weather events have been associated with deaths, injuries, mental stress, and financial duress (Health Canada, 2005; Lancet Countdown, 2017).

Globally, coal plants must be phased out to slow climate change. On a global scale, coal plants are one of the most significant sources of greenhouse gases (**GHGs**). They are responsible for 44% of the energy-related carbon dioxide (**CO_2**) emitted around the world and 29% of the GHGs from all anthropogenic sources (IEA, 2015). The International Energy Agency (**IEA**) has identified the phase out of coal plants as one of the five climate policies essential to international success on climate change

(IEA, 2015). If Canada is to effectively advocate for the closure of coal plants around the world, it must demonstrate that it is willing and able to do so at home.

Coal plants are also significant emitters of GHGs in Canada. While coal plants provided only 10.6% of Canada's electricity in 2014, they were responsible for 72% of the GHGs emitted from the electricity sector. Before 2005, coal-fired power plants were responsible for about 15% of Canada's GHGs. This percentage dropped to 8.4% in 2014 after Ontario completed phasing out its six coal plants. Coal plants continue to be among the top GHG emitters in Alberta, New Brunswick, Nova Scotia, and Saskatchewan (NIR, 2014).

The global closure of coal plants would produce immediate health benefits for millions of people. On a global scale, outdoor air pollution is responsible for approximately 3.7 million premature deaths per year from heart disease, strokes, chronic obstructive pulmonary disease, lung cancer and acute lower respiratory infections among children (WHO, 2014b). The emissions from coal-fired power plants are responsible for a significant share of these deaths and many other chronic and acute health impacts.

An accelerated coal phase-out in Canada could produce air pollution-related health benefits valued at $4.9 billion. In 2017, there were 36 coal-fired electricity generating units operating at 16 coal plants in four provinces: Alberta, Saskatchewan, Nova Scotia, and New Brunswick. In 2015, nine of these plants were among the top 13 sources of sulphur dioxide (**SO_2**) emissions in Canada, while 10 were among the top 13 sources of nitrogen oxides (**NO_x**) (ECCC, 2014a). SO_2 and NO_x, which are harmful pollutants themselves, can also be transformed into fine particulate matter (**$PM_{2.5}$**) and ground-level ozone in the atmosphere. $PM_{2.5}$ 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 criteria air contaminants (**CACs**) 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 (WHO, 2013).

The Regulatory Impact Analysis Statement (**RIAS**), prepared by Environment Canada and Health Canada for the 2012 federal coal regulations, 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 (RIAS, 2012).

In 2016, the Pembina Institute extrapolated the RIAS results at a regional level and estimated that a 2030 phase-out of Canada's coal plants (including Alberta's units) that included a staged phase-out and replacement of two-thirds of electricity generated with renewables, would nearly double the air pollution-related health benefits estimated for the 2012 regulations. It would prevent 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 (Pembina, 2016).

A Canada-wide coal plant phase-out would also help protect the mental capacity of our children from the harmful effects of mercury. Coal-fired power plants are a major source of mercury; 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% of intellectual disability cases in the United States to mercury exposure and valued these excess cases at $2.0 billion per year (Trasande, 2006). Women of childbearing age, pregnant women, children, and populations that depend on fish as a traditional food source, are at greatest risk from mercury (CCME, 2005). Long-range transport of environmental contaminants means that elevated exposures to mercury is a particular concern for Arctic peoples as well (Van Oostdam et al., 2005).

In 2014, nearly 2,400 kilograms of mercury were emitted into the air from 269 sources across Canada (ECCC, 2014b). Coal-fired power plants were the single largest source of those mercury emissions:

- They were responsible for nearly 35% of mercury emissions into the air nationally;
- Two plants in Saskatchewan were the two highest emitting sources in the country; responsible for approximately 16% of all mercury released into air across Canada;
- The three plants in Saskatchewan were responsible for 80% of that province's emissions;
- The four plants in Nova Scotia were responsible for 83% of that province's emissions;
- The coal plant in New Brunswick was responsible for 95% of that province's emissions; and
- The six plants in Alberta were responsible for 66% of that province's emissions and nearly 10% of Canada's mercury emissions to air (ECCC, 2014b).

Health Canada and Environment Canada estimated that mercury emissions avoided between 2015 and 2035 by the 2012 coal regulations would produce health benefits valued at $26 million in Canada. The RIAS notes however 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 health benefits for the 2012 regulations in the range of $1.3 billion (Pembina, 2016).

The 2018 RIAS estimates that the amended coal regulations would produce approximately $1.2 billion in health benefits from 2019 to 2055. These health benefits have been estimated for the 14 of the 36 coal-fired units that are expected to be affected by the federal regulations; five units in Alberta, one in Saskatchewan, one in New Brunswick, and seven in Nova Scotia. These health benefits exclude all of the health benefits associated with the closing of coal plants in Alberta, which are attributed to the provincial regulations, except for the five units affected during the period from January 1st 2030 to December 31st 2030 when some of the coal plants in Alberta would have still been operating. The $1.2

billion in health benefits are attributed to reductions in air levels of secondary $PM_{2.5}$ (60%) and ground level ozone (40%). An additional $5 million in health benefits are attributed to reductions in emissions of mercury (RIAS, 2018a).

Detailed Comments

S1 We strongly support the inclusion of all existing coal-fired electricity generating units in this regulation, even those that are expected to close before 2030 because of current provincial regulations, to ensure that there is a back stop for all provincial regulations.

S1(2) We support the addition of the December 31st, 2019 closing date for units commissioned before 1975 and the December 31st, 2029 closing date for units commissioned after 1975, to the 50-year rule contained in the 2012 regulations.

S2 3(5) We can accept the exclusion of coal-fired units equipped with Carbon Capture and Storage (CCS) technology only if that provision is tied to equivalency agreements with the provincial governments that require emission rates of CACs and mercury for each unit to be limited to emission rates equivalent to those achieved with gas turbine combined cycle (GTCC) units run on natural gas.

Equivalency Equivalency agreements between Canada and the provinces should consider the CACs and mercury emissions associated with coal-fired units as well as the GHGs to ensure that Canadians in the affected regions receive health benefits equivalent to those associated with the accelerated closure of coal-fired generating units.

Thank you for the opportunity to provide comments on the proposed amendments.

Yours Sincerely,
Kim Perrotta, Executive Director, **Canadian Association of Physicians for the Environment**
Dr. Joe Vipond, Board Member, **Canadian Association of Physicians for the Environment**
Amy Henderson, Manager, Public Policy, **The Lung Association - National Office**
Vanessa Foran, President and CEO, **Asthma Canada**
Ian Culbert, Executive Director, **Canadian Public Health Association**
Jennifer Ott, President, **Canadian Nurses for Health and the Environment**
Wanda Martin, Interim President, **Saskatchewan Public Health Association**
Linda Varangu, Executive Director, **Canadian Coalition for Green Health Care**
Doris Grinspun, RN, MSN, PhD, Chief Executive Officer, **Registered Nurses' Association of Ontario**
Dr. Monika Dutt, Executive Director, **Upstream**
Pegeen Walsh, Executive Director, **Ontario Public Health Association**

cc. The Honourable Catherine McKenna, Federal Minister of the Environment
The Honourable Ginette Petitpas Taylor, Federal Minister of Health
The Honourable Sarah Hoffman, Alberta Minister of Health
The Honourable Shannon Phillips, Alberta Minister of Environment and Parks and Minister

Responsible for the Climate Change Office
The Honourable Bronwyne Eyre, Saskatchewan Minister of Energy and Resources
The Honourable Jim Reiter, Saskatchewan Minister of Health
The Honourable Serge Rousselle, New Brunswick Minister of Environment and Local Government
The Honourable Benoit Bourque, New Brunswick Minister of Health
The Honourable Iain Rankin, Nova Scotia Minister of the Environment
The Honourable Randy Delorey, Nova Scotia Minister of Health and Wellness and Seniors

References:

- Canadian Council of Ministers of the Environment (CCME). 2005. Canada-Wide Standards for Mercury Emissions from Coal-Fired Electric Power Generation Plants (2006).
- COP21 United Nations Climate Change Conference (COP21). 2015. Climate Change 2015-2016.
- Environment Canada and Climate Change (ECCC). 2014a. NPRI Data: Sulphur Dioxide. NPRI-Sulphur Dioxide-2014
- Environment Canada and Climate Change (ECCC). 2014b. NPRI Data: Mercury. NPRI-Mercury-2014
- Environment and Climate Change Canada (ECCC) and Health Canada. 2018a. Regulatory Impact Analysis Statement. Proposed Regulations Amending the Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations.
- Health Canada. 2005. Human Health in a Changing Climate: A Canadian Assessment of Vulnerabilities and Adaptive Capacity.
- International Energy Agency (IEA). 2015. Energy and Climate Change. IEA-Climate Change 2015
- Lancet Countdown and Canadian Public Health Association (CPHA). 2017. Lancet Countdrown 2017 Report: Briefing for Canadian Policymakers.
- National Inventory Report (NIR). 2014. Table A13-1 of Part 3. UNFCCC Inventories 2014
- Pembina Institute, CAPE, CPHA, The Lung Association, the Asthma Society. 2016. Out with the coal, in with the new. National benefits of an accelerated phase-out of coal-fired power.
- Trasande. L, C Schechter, K.A. Haynes, P.J. Landrigan. 2006. Mental retardation and prenatal methylmercury toxicity. Am J Ind Med. 2006 Mar;49(3):153-8.
- Van Oostdam J. et al. 2005. Human health implications of environmental contaminants in Arctic Canada: A review. Sci Total Environ. Dec 1;351-352:165-246.
- World Health Organization (WHO). 2013. Review of evidence on health aspects of air pollution – REVIHAAP Project.
- World Health Organization (WHO). 2014a. Quantitative risk assessment of the effects of climate change on selected causes of death, 2030s and 2050s.
- World Health Organization (WHO). 2014b. Ambient (outdoor) air quality and health. Fact sheet N°313 Updated March 2014.
- World Health Organization (WHO). 2016. WHO Director-General Keynote address at the Human Rights Council panel discussion on climate change and the right to health.