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ELECTRICITY AND ENVIRONMENTAL PROTECTION

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For

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Introduction

Founded in 1970, the Canadian Institute for Environmental Law and Policy (CIELAP) is an independent, not-for-profit research and educational organization. Its mission is to develop and advance proposals for the reform of environmental law and public policy. CIELAP's research is intended to assist government, industry, public interest groups, political parties and individuals in their daily decision-making and to further the protection of human health and the preservation of the natural environment.

In this submission we will outline how the generation and sale of electricity in Ontario can be conducted in a manner which is consistent with, and supportive of, Canada's obligations pursuant to the United Nation's Framework Convention On Climate Change.

United Nation's Framework Convention On Climate Change

In 1992, at the Earth Summit in Rio de Janeiro, over 150 countries signed the Framework Convention On Climate Change. The ultimate objective of the Convention is to stabilize the concentrations of greenhouse gases in the atmosphere:

"achieve...stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."

In order to stabilize the concentrations of greenhouse gases in the atmosphere, the world's greenhouse gas emissions must be substantially reduced. For example, according to the best scientific evidence, i.e., the Intergovernmental Panel on Climate Change, global carbon dioxide (CO₂) emissions must be reduced by more than 50% in order to stabilize the concentrations of greenhouse gases in the atmosphere at their present levels.

As a first step towards the achievement of the Convention's ultimate objective, developed nations, including Canada, made a commitment to stabilize their greenhouse gas emissions, excluding CFC and HCFC emissions, at their 1990 levels by the year 2000. (CFC and HCFC emissions are controlled by the Montreal Protocol.)

In 1995, at Berlin, the Conference of the Parties to the Framework

Convention agreed to commence negotiating post year 2000 greenhouse gas emission reduction targets and timetables for the developed nations.

The Federal Government's Targets

The Government of Canada is committed to stabilizing Canada's greenhouse gas emissions, at the 1990 level, by 2000.

In addition, the Government of Canada supports the objective of reducing Canada's CO₂ emissions by 20% by 2005. According to the Honourable Sheila Copps, the Deputy Prime Minister and a former Minister of the Environment:

"The Canadian Government supports the objective of cutting carbon dioxide emissions by 20% from 1988 levels by the year 2005."

Ontario's Targets

The Government of Ontario, like the Government of Canada, is committed to stabilizing Canada's greenhouse gas emissions, at the 1990 level, by the year 2000.

Furthermore, on June 9, 1994, the Legislative Assembly of Ontario unanimously endorsed a 20% reduction in Canada's greenhouse gas emissions by 2005:

"Therefore this assembly supports the federal government in its commitment to a 20% reduction in Canada's greenhouse gas emissions over 1988 levels by 2005, and further supports leadership on the part of Ontario in helping to develop and implement a national action plan to achieve this environmentally imperative goal."

The National Action Program

According to Canada's National Action Program on Climate Change, existing policies, programs and voluntary commitments as of 1995 were not expected to stabilize Canada's greenhouse gas emissions by the year 2000 or to reduce Canada's greenhouse gas emissions after the year 2000:

"Current forecasts predict that Canada's greenhouse gas emissions could be in the order of 13% above 1990 emissions by the year 2000, depending upon key underlying assumptions related to energy prices, economic growth and the relative growth of more energy intensive sectors of the Canadian economy."

Ontario's CO₂ Emissions

CO₂ is responsible for 79% of Canada's greenhouse gas emissions that are not controlled by the Montreal Protocol (i.e., CFCs and HCFCs).

Ontario's net CO₂ emissions in 1990 equalled 147,797 kilotonnes. Ninety-eight (98%) of these emissions were due to the consumption of fossil fuels.

In 1990, 18.6% (26,852 kilotonnes) of Ontario's fossil fuel-related CO₂ emissions were due to electricity generation.

According to Natural Resources Canada's business as usual forecast, Ontario's electricity-related CO₂ emissions in 2000 and 2005 will be 20,621 and 25,033 kilotonnes respectively.

Ontario Hydro's Greenhouse Gas Strategy

In January 1995, Ontario Hydro's Board of Directors voluntarily committed Ontario Hydro to:

- 1) stabilize its net greenhouse gas emissions at its 1990 level by the year 2000; and
- 2) reduce its net greenhouse gas emissions by 26%, relative to its 1988 level, by 2005.

CO₂ is responsible for 98% of Ontario Hydro's greenhouse gas emissions. However, Ontario Hydro's greenhouse gas strategy may not lead to the stabilization or reduction of Ontario's electricity-related CO₂ emissions for the following reasons.

- 1) Ontario Hydro's greenhouse gas emission target does not include the greenhouse gas emissions associated with its electricity purchases from private sector generators. As a consequence, Ontario Hydro could meet its greenhouse gas emission targets by phasing-out its coal-fired electricity generation and by purchasing CO₂ producing electricity from private sector generators. Under this scenario, Ontario Hydro could simultaneously meet its greenhouse gas target and cause a net increase in global greenhouse gas emissions (e.g., if Ontario Hydro purchased coal-fired electricity from U.S. utilities).
- 2) Ontario Hydro's greenhouse gas target for 2005 is with respect to the net impact of its world-wide operations (e.g., it could include the net impact of purchasing a rain forest in Central America). As a consequence, Ontario

Hydro could meet its year 2005 greenhouse gas target even if the greenhouse gas emissions of its Ontario-based fossil generating stations are not reduced by approximately 26%.

- 3) If competition is permitted in the Ontario electricity marketplace, Ontario electricity consumers will be able to purchase their electricity from non-Ontario Hydro sources of supply. As a result, Ontario Hydro's CO₂ emissions could fall dramatically due to a decline in its market share. However, the fall in Ontario Hydro's CO₂ emissions could be more than offset by a rise in the CO₂ emissions of non-Ontario Hydro generators (e.g., municipal electric utilities and domestic and foreign private sector generators).

Finally, it is important to note that Ontario Hydro has not made any commitments to reduce its CO₂ emissions prior to the year 2000. On the contrary, at present Ontario Hydro is offering its large customers special discounted rates to encourage them to consume more electricity. Since 70% of its incremental sales are met by increasing the output of its coal-fired generating stations, Ontario Hydro's rate discounts are increasing Ontario's CO₂ emissions.

A Regulatory Strategy to Control Electricity-Related CO₂ Emissions

The Government of Ontario can ensure that the generation and sale of electricity in Ontario is consistent with, and supportive of, our obligations pursuant to the Framework Convention On Climate Change by establishing a comprehensive system of CO₂ emission quotas with respect to the generation and sale of electricity in Ontario. To be specific, the Government of Ontario could regulate Ontario's electricity-related CO₂ emissions by:

- 1) establishing CO₂ emission targets with respect to all electricity that is generated or sold in Ontario; and
- 2) enforcing the targets by requiring CO₂ emission quotas for the generation and sale of electricity in Ontario.

For example, if the CO₂ target is to reduce electricity-related CO₂ emissions by 20%, relative to the 1988 level, by 2005 then the magnitude of the CO₂ emissions in 2005 must not exceed 80% of Ontario's electricity-related CO₂ emissions in 1988.

The Government of Ontario could allocate the CO₂ emission quotas to Ontario Hydro and Ontario's other electricity generators (e.g., Dow Chemical, TCPL, TransAlta).

The non-Ontario Hydro generator's CO₂ emission quotas could approximately equal their current level of electricity-related CO₂ since they produce electricity by relatively clean processes (e.g., gas-fired cogeneration).

The remaining CO₂ quotas could be allocated to Ontario Hydro.

However, everything else being equal, this quota allocation procedure could prevent:

- 1) municipal utilities and private sector corporations that are generating fossil-fired electricity in Ontario from significantly increasing their fossil-fired electricity generation; and
- 2) municipal utilities and private sector corporations that are not generating fossil-fired electricity in Ontario from entering this market.

Such an outcome would frustrate the development of a competitive market with respect to the generation and sale of electricity in Ontario.

The above-noted outcome can be avoided by requiring Ontario Hydro to lease fractions of its CO₂ emission quota to municipal utilities and private sector corporations for a fee which equals their market values. Ontario Hydro could use the resulting revenues to reduce its rates.¹

In order to ensure that Ontario Hydro does not institute CO₂ emission quota terms and conditions and fees which are designed to frustrate the development of a competitive market with respect to the generation and sale of electricity, the Ontario Energy Board could be required to regulate the terms and conditions of Ontario Hydro's CO₂ quota leases and the process for determining their market value.

In order to permit the electricity sector greater flexibility to respond to changing business conditions, they could be allowed to allocate their CO₂ emission quotas within a rolling time period. For example, if the electricity sector's quota

¹. The Advisory Committee on Competition in Ontario's Electricity System (the Macdonald Committee) has recommended that Ontario Hydro be broken up into a system operator, a transmission grid company and numerous competing electrical generating companies. If the Government of Ontario accepts their recommendations, the CO₂ emission quotas could be allocated to the system operator or the transmission grid company. The system operator or the transmission grid company could lease the emission quotas to the electricity generators and marketers.

equals 20,000 kilotonnes per year for five years, it could be allowed to emit more than 20,000 kilotonnes in one or more years as long as its total CO₂ emissions during the five year period does not exceed 100,000 kilotonnes (20,000 kilotonnes x 5 years).

Options to Reduce Electricity-Related CO₂ Emissions

Ontario's electricity-related CO₂ emissions can be reduced by one or more of the following actions:

- 1) promoting the efficient use of electricity;
- 2) promoting end-use fuel switching (e.g., converting electric water heaters to solar/electric water heaters, converting electrically heated homes to gas);
- 3) obtaining additional electric supplies from non-fossil sources (e.g., renewable technologies); and
- 4) obtaining additional electric supplies from high efficiency, low carbon intensity technologies, e.g., fuel cells and natural gas-fired cogeneration (the CO₂ emissions per kilowatt-hour of gas-fired cogeneration are 66% to 70% less than those of Ontario Hydro's coal-fired generating stations).

Economic Analysis

According to a report prepared by the Energy Research Group at Simon Fraser University, the aggressive promotion of the efficient use of electricity and end-use fuel switching to natural gas and renewable energy could simultaneously dramatically reduce Ontario's electricity-related CO₂ emissions and reduce the energy costs of Ontario's residential, commercial and industrial consumers.

To be specific, the Energy Research Group's analysis shows that Ontario's electricity-related CO₂ emissions in 2000 and 2005 could be cost-effectively reduced by 97% and 60% respectively relative to Natural Resources Canada's business as usual forecast. That is, Ontario's electricity-related emissions could be as low as 520 and 10,090 kilotonnes in 2000 and 2005 respectively.

Other Environmental Benefits

In 1990 Ontario Hydro's coal-fired electricity generating stations were responsible for 12%, 16% and 7% of Ontario's nitrogen oxides, sulphur dioxide and mercury emissions respectively. Nitrogen oxides and sulphur dioxide are precursors of urban smog and acid rain. Mercury is a carcinogen which can have significant adverse impacts on human health, wildlife and the aquatic food chain.

As a consequence measures to reduce the output of Ontario's coal-fired electricity generating stations will simultaneously reduce the emissions of nitrogen oxides, sulphur dioxide and mercury.

The Proposed Sale of Ontario Hydro's Coal-Fired Generating Stations

The Macdonald Committee has recommended that the Government of Ontario should sell Ontario Hydro's coal-fired generating stations.

If the Government of Ontario establishes CO₂ emission quotas which require a significant reduction in Ontario's electricity-related CO₂ emissions, the market value of Ontario Hydro's coal-fired generating stations could be dramatically reduced.

The Ontario CO₂ Collaborative

Next week the Ontario CO₂ Collaborative will be releasing its final report, A CO₂ Strategy for Ontario: A Discussion Paper.

The Ontario CO₂ Collaborative is a joint venture of the Canadian Institute for Environmental Law and Policy; a 37 person multi-stakeholder (business, labour, consumer and environmental groups) Advisory Committee and the Energy Research Group at Simon Fraser University.

The Collaborative's report will outline a strategy which could simultaneously reduce Ontario's CO₂ emissions by 20% and reduce the energy costs of Ontario's residential, commercial and industrial consumers. In particular, it will outline options to control Ontario's electricity-related CO₂ emissions.

In my opinion, the Collaborative's report will be of assistance to NDP's Taskforce on Hydro.