

Manitoba Hydro's Position

# **Climate Change** and the Kyoto Protocol



presented at the  
**National Stakeholders Workshop on Climate Change,  
Review of Economic Analysis and Federal Discussion Paper**  
June 19th, 2002

## **Climate Change and the Kyoto Protocol**

There is broad international agreement that human activities are increasing the concentration of greenhouse gases in the atmosphere and that this is having a discernible impact on the global climate. Manitoba Hydro believes that major national and international efforts are required immediately to manage greenhouse gas emissions. Because of its dedication to this global issue, Manitoba Hydro has voluntarily adopted a greenhouse gas emission reduction commitment of 6% on average, the most aggressive voluntary commitment of all Canadian electrical utilities. Manitoba Hydro recognizes that significant national emission reductions will require more than voluntary efforts and calls for a mandatory national emission management program to be implemented regardless of the outcome of Canada's ratification decision.

Canadians rely on hydropower to supply over 60% of our electrical needs. In Manitoba, hydropower supplies an even greater portion – currently over 95%. Manitoba Hydro believes that new hydropower projects can play a major role over the next ten years in reducing Canadian and global greenhouse gas emissions. The year 2000 reports of both Canada's Analysis and Modeling Group and the Electricity Table demonstrated that new hydropower was one of the largest individual opportunities to reduce Canadian greenhouse gas emissions.

Manitoba Hydro's existing clean hydropower is positively impacting global greenhouse gas emissions by offsetting fossil-fuelled electricity generation. From 1970 to 2000, Manitoba Hydro's exports to the United States resulted in emission reductions in the U.S. of approximately 157 million tonnes of carbon dioxide (CO<sub>2</sub>), 291 thousand tonnes of nitrogen oxides (NO<sub>x</sub>), and 623 thousand tonnes of sulfur oxides. Manitoba Hydro's exports to the rest of Canada have been smaller than to the U.S. but these have also reduced greenhouse gases and other emissions. At current export levels, Manitoba Hydro is preventing about 10 million tonnes of CO<sub>2</sub> equivalents (CO<sub>2</sub>e) per year or roughly 50% of Manitoba's total emissions.

Additional hydropower generation, developed under the right conditions, could be supplied to

export markets and displace additional CO<sub>2</sub> emissions. As Canada presented recently at the United Nations Cleaner Energy Export Workshop, there is an enormous long term potential for expansion of Canada's clean hydropower and sites capable of producing several hundred terawatt hours (TWh) per year have been identified. In Manitoba alone, there is the potential to develop up to an additional 1,100 megawatts (MW) (8 TWh/year) by 2012 which could potentially displace approximately 5 million tonnes of CO<sub>2</sub>e per year.

For Canada to achieve these emission reduction opportunities the right conditions must be present. These conditions include an emission trading system that delivers a clear economic advantage to renewable resources like hydropower, an appropriate and efficient regulatory system, and adequate inter-provincial transmission. Manitoba Hydro is working with Federal and Provincial governments and other stakeholders to encourage these conditions.

Manitoba Hydro has been an active participant in the national analysis and debate regarding Kyoto ratification. Manitoba Hydro employees have participated in the Electricity Table, Domestic Emission Trading Working Group, Analysis Modeling Working Group, and the Integrative Group among others. Manitoba Hydro's thinking and position have been significantly informed by our intensive participation throughout this four year national process.

Canadian ratification of the Kyoto Accord will entail dramatic changes in how the entire Canadian energy sector and other sectors work and will likely have a net cost to the Canadian economy over the next 10 to 20 years. It is anticipated that in the long term the benefits to limiting greenhouse gas emissions (and other emissions) and the rate of climate change will outweigh these medium term costs. Manitoba Hydro recognizes that any decision with respect to ratification must consider a range of interests that extends far beyond the purview of the electricity industry. The challenge is to find a path where the overall impacts to the Canadian economy, the competitiveness of Canadian industry, and the regional equity questions have all been adequately addressed. Manitoba Hydro is hopeful that the Federal

Government's preferred option can be designed in such a fashion and that the consultations and studies continuing over the next few months will provide sufficient information for Canada to make informed judgements on ratification.

### New Clean Hydropower

Hydropower is a renewable resource and, when developed properly, it is a clean resource.

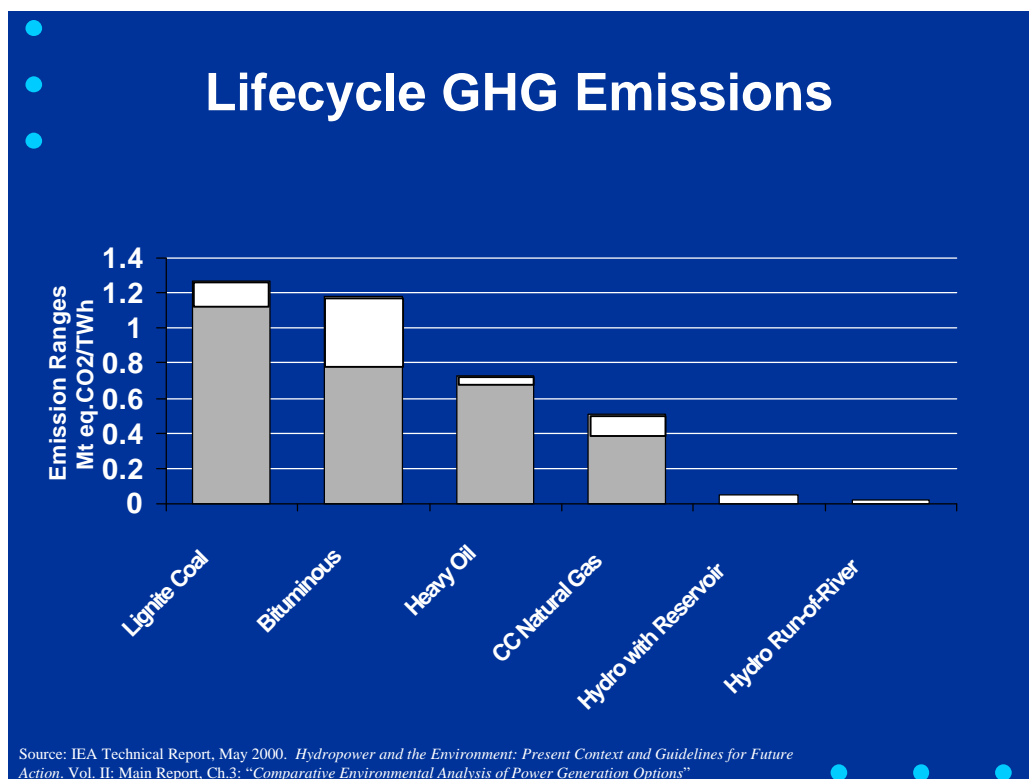
Evolving scientific knowledge, standards, and societal values are changing the way new projects are designed, assessed, and developed. Before a new project can be developed it must go through a rigorous process that examines the impact the project could have on the environment and local communities. Water flows, water quality, watershed management, fish passage, habitat protection, as well as the welfare and lifestyle of local communities are all taken into consideration as part of the impact assessment. State of the art design practices are applied to avoid or mitigate environmental and social impacts.

Projects currently under consideration by Manitoba Hydro will feature extensive design revisions to virtually eliminate new flooding and thereby reduce the potential for greenhouse gas emissions to virtually 0 (less than 0.1% of coal generation,

less than 0.3% of natural gas generation). For example, the Wuskwatim Generating Station was redesigned to reduce the flooded area from 112 km<sup>2</sup> to 0.4 km<sup>2</sup> resulting in a drop in output from 340 MW to 200 MW as well as resulting in a significant increase in the per unit cost. The Conawapa Generating Station is proposed to deliver 1,300 MW and result in only 5 km<sup>2</sup> of flooding. The Gull project was originally designed as an 1,100 MW generating station. The project has been redesigned to 620 MW configuration and as such it will result in the reduction of anticipated impacts on the environment and local first nation communities. The minimization of flooding has also virtually eliminated land use changes including the potential for mercury release, greenhouse gas emissions, deforestation, etc..

Lifecycle environmental impact assessment demonstrates that large hydro, like wind and solar, results in very low emissions relative to fossil-fuelled resources (see the figure below).

Further, while large hydro has similar (or, in many cases, lower) lifecycle environmental impacts than other renewable technologies, it offers energy at a significantly lower cost and contributes to considerably greater operating flexibility and reliability.



Manitoba Hydro is working with local aboriginal communities to facilitate their participation in any future hydro projects including the possibility of joint ownership, employment and training opportunities, and related business opportunities. Furthermore, Hydro and its Cree Nation partners are incorporating aboriginal traditional ecological knowledge into the environmental impact assessment for proposed new projects.

Manitoba Hydro is working with five Cree Nations: Nisichawayasihk Cree Nation, Tataskweyak Cree Nation, War Lake Cree Nation, York Factory Cree Nation and Fox Lake Cree Nation in regard to the proposed Wuskwatim, Notigi and Gull/Keeyask development projects in northern Manitoba. Manitoba Hydro is engaged in detailed studies and has not yet decided to proceed with these projects; any such decision would only be made with the local aboriginal community support. Manitoba Hydro has signed Agreements in Principle relating to future development with Tataskweyak Cree Nation (October 2000) and Nisichawayasihk Cree Nation (September 2001).

### **Manitoba Hydro Greenhouse Gas Activities**

Manitoba Hydro has been actively reducing greenhouse gas emissions for several years. The following list outlines some of our major initiatives to date:

- The 1,330 MW Limestone Generating Station came into full production in 1992. The Limestone Generating station increased our electrical capacity by 25% with no additional greenhouse gas emissions.
- Our exported power produced largely from hydraulic generating stations displaces energy which otherwise would be largely produced at fossil-fuelled stations. In 1990/91 Manitoba Hydro exported 3,034 gigawatt hours (GWh) more than it imported (4796 GWh exported, 1762 GWh imported.) In 1997/98 Manitoba Hydro achieved its maximum annual net export to date – 13,399 GWh – which displaced coal generated electricity and reduced emissions.
- Four coal-fired generating units were retired from service at the Brandon Generating Station in 1996, reducing our coal generating capacity by 132 MW, equivalent to about one-third of our fossil-fuelled generating capacity at that time.
- A \$30 million project is just being completed in June 2002 to convert Selkirk Generating Station's fuel source from coal to natural gas. This conversion will reduce Manitoba Hydro's total forecasted emissions by about 180,000 tonnes per year.
- Nine communities previously served by diesel generating stations have been connected to the provincial transmission grid and as a result 11.68 megawatts of diesel-generation capacity has been removed from service for a reduction in emissions of over 20 kilotonnes of CO<sub>2</sub>e emissions per year.
- At the end of the 1999/2000 fiscal year, Power Smart Demand Side initiatives resulted in 352 GWh of energy savings. Manitoba Hydro is committed to greatly expanding its Power Smart Programs.
- Currently Manitoba has a 14 per cent share of Canada's ground source heat pump installations. These results are due in part to Manitoba Hydro's program to finance the purchase and the installation of the heat pump and equipment. Manitoba Hydro has set the goal of doubling the number of heat pumps installed in Manitoba by the year 2012.
- Manitoba Hydro has provided over \$20 million dollars in Power Smart Residential Loans to Manitobans helping them to install energy efficient measures such as high efficiency furnaces, increased insulation and energy efficient windows and doors. To date these energy efficiency improvements have reduced Manitoba's emissions of carbon dioxide by an estimated 2,500 tonnes.
- Supply side efficiency improvement projects will result in a further 380 GWh per year of energy improvements by 2006.
- As an initiative to voluntarily reduce not only greenhouse gases but also other gases, in 2001 Manitoba Hydro adopted a policy of including the consideration of environmental externality costs in the dispatch decisions of its fossil-fuelled generation. This has the effect of reducing the amount of use of such generation.

