

Hydro-Québec Brief

**Submitted for the federal consultation on Canada's
contribution to addressing climate change**

June 27, 2002

The Effects of Climate Change

The vast majority of the scientific community believes that greenhouse gas (GHG) emissions produced by human activities contribute significantly to climate change and to greater frequency of extreme weather events. Given that climate change can have negative repercussions on health and on the economy, both in Canada and worldwide, it makes sense to adopt a prudent approach and to undertake global initiatives against this planetary problem. This is why Hydro-Québec, along with universities and government partners, is spending millions of dollars to fund *Ouranos*, a research consortium on climatology and climate change adaptation.

Kyoto and Carbon Constraints

In Canada, power generation is responsible for 17% of GHG emissions, and electricity demand is continually growing. GHG emissions from power generation in Canada increased by 25% from 1990 to 1999.¹ Hydro-Québec believes that constraints on GHG emissions will eventually be necessary to establish a level playing field that takes into account the difference between fossil-fuel-based generating facilities and renewable-based facilities in terms of environmental impacts. For each unit of electrical energy produced, recently built hydropower facilities in Québec emit 20 times less GHGs than natural-gas-fired power plants using the best technology available, and 60 times less than coal-fired plants.²

Although the Kyoto Protocol has its shortcomings, Hydro-Québec believes it is still an essential first step in the global management of GHG emissions, and no globally viable alternative is available.

For these reasons, Hydro-Québec is in favour of Canada's ratification of the Kyoto Protocol.

Hydro-Québec's Positions in the Last Four years

Hydro-Québec has been active in the consultation processes put into place by the governments of Canada and Québec in the past four years. To minimize the total cost of GHG constraints, Hydro-Québec has promoted economic efficiency as the key criterion for selecting the GHG control measures to be adopted by government.

All of the following positions defended to date by Hydro-Québec seek to achieve the greatest efficiency in GHG reduction:

- Establishing a tradable permit system as the principal GHG control tool.
- Adopting a performance criterion as a method of allocating permits in the power generation industry.
- Rejecting allocation based on historic emissions, which would be tantamount to rewarding poor performance.
- Adopting measures to ensure that hydropower development can effectively contribute to reducing emissions.
- Recognizing emissions avoided by recent and future generating stations on the same level as direct reductions from existing emission sources. In this regard, the Québec registration program *ÉcoGES* recognizes that Hydro-Québec's actions between 1990 and 1998 have helped avoid more than 78 megatonnes (Mt) of CO₂ emissions.

¹ Canada's Third National Report on Climate Change, Government of Canada, 2001.

² Based on life-cycle analysis.

Hydro-Québec's Reactions to the Federal Discussion Paper

In terms of the positions supported by Hydro-Québec, the federal Discussion Paper as it now stands is only partially satisfactory and there is clearly room for improvement. Although most of the options presented advocate a tradable permit system as the principal management tool and although two of these favour an allocation method based on performance criteria, a major weakness of the federal paper is that it does not recognize hydropower's vast potential for reducing GHGs at a very low cost and that it contains no significant measure that would help accelerate the development of Canada's hydropower potential.

Notwithstanding this major shortcoming, Hydro-Québec believes that the federal Discussion Paper constitutes an adequate base for developing a real action plan, provided that certain adjustments are made to increase its economic and environmental efficiency and decrease its costs to the Canadian economy.

General comments

Hydro-Québec believes that priority must be given to identifying measures that will minimize the economic costs of ratification and maximize the benefits in other areas, such as employment and air quality.

No matter what option is discussed, the current version of the federal paper is incomplete in that it does not take full advantage of hydropower development potential as an effective means of reducing GHG emissions. For example, the modeling results in the federal paper exclude the possibility of any additional hydropower beyond the amount already on stream in the business-as-usual scenario. Consequently, no matter what price per tonne CO₂ reaches, hydropower's contribution to Canada's effort will not vary at all. This is the result of a poor understanding of both hydropower development potential and the difficulties facing new hydro projects.

Hydropower: an effective means of reducing GHGs at negligible cost

Over and above the potential of the hydropower projects included in the modeling, great potential for reducing GHGs is offered by additional projects that would be feasible if specific measures for hydropower development were implemented by the federal government.

The intrinsic qualities of hydropower projects, which are well received by or even developed in partnership with local communities and which produce clean, renewable energy without emitting air pollutants,³ are not sufficiently recognized by government authorities, thereby minimizing their contribution to GHG emissions reduction.

Any measures that the government takes to recognize the real contribution of hydropower and to reduce regulatory risk will significantly increase, at no cost, the emissions avoided by new hydropower generation. Such measures will also accelerate the completion of many large hydropower projects, so that they can be commissioned within the 2008-2012 commitment period in order to fully contribute to achieving the Canadian target set in Kyoto. We believe that with adequate support from the Canadian government, hydropower could, in Québec alone, increase the clean, renewable energy supply by 15 TWh/year

³ Based on life-cycle analysis, recent hydropower projects in Québec emit 60 times less GHGs than coal-fired generating stations.

compared with the business-as-usual scenario and thus decrease GHG emissions by at least 5 Mt in 2012.

Targeted measures to promote hydropower

To optimize hydropower's contribution to GHG emissions reduction, the following targeted measures should be implemented in combination with a tradable permit system.

Review of ministerial regulations and guidelines

When planning a new hydropower facility, developers are faced with major uncertainties and risks: whether or not they will obtain the various permits necessary, which studies will be required, and how much time and money it will take to conduct the studies and obtain final authorization to go forward with the project.

To develop Canada's hydropower potential and thereby achieve significant reductions in GHG emissions in the power industry, government regulations, policies and guidelines—and the way they are applied—must be changed to give priority to the development of renewable energy. For now and the foreseeable future, all hydropower generation that is not built will be replaced by fossil-fuel-based generation, making it increasingly difficult to achieve the Canadian target.

For example, those responsible for applying the regulations must have the necessary tools to properly weigh the need to safeguard a fish habitat against the need to address climate change by clearly favouring renewable energy. What is the point in protecting a brook trout habitat by rejecting a hydropower project, when global warming poses a much more serious threat to all trout and salmon habitats, both in Canada and around the world? Government authorities and decision-makers must establish a balance between short-term, local impacts and planetary issues like climate change and be able to choose the option that is least damaging for the environment. Regulations, policies and guidelines must therefore be modified to give more importance to the fight against global pollution as part of each ministry's responsibilities.

Improve the assessment of Canada's hydropower potential and its sensitivity

Canada's hydropower potential is not well known and in some provinces has never been studied in detail. A better understanding of this potential is essential to maximizing hydropower's contribution to GHG emissions reduction.

To rectify this situation, the Canadian government must work with the provincial authorities and the Canadian hydropower industry to determine just how much hydropower potential is available under the business-as-usual scenario and, especially, how sensitive it is to variations in the price per tonne of CO₂ and to certain regulatory changes.

For an efficient tradable permit system

The creation of a Canadian tradable permit system is an efficient means of internalizing a portion of the environmental costs of fossil fuels, and it must be part of any federal strategy to reduce GHG emissions.

However, to ensure that the different economic players receive a clear price signal to prompt them to make optimal economic and environmental decisions without

compromising the vitality of the Canadian economy, Hydro-Québec reiterates that any gratis allocation of permits must be based on a single performance criterion for the entire power industry. This criterion, expressed in kilograms of CO₂/MWh, should be drawn from the best economically available technology, as determined in light of discussions with the power industry.

The allocation method must also take into account hydropower development achieved over the past few years and future hydropower developments, either by allocating permits to the hydropower industry or by allocating fewer permits than needed to GHG-emitting thermal power producers, thereby obliging them to buy permits.

In a tradable permit system, the law of supply and demand favours the lowest-cost producer and the one that is best able to reduce GHG emissions. The price per tonne of CO₂ will determine the additional hydropower potential that can be economically developed and the resulting level of emissions reduction.

Assuming an increase in fossil fuel prices and regulatory adjustments, the additional hydropower potential that could be developed in Québec alone by 2012 would help reduce GHG emissions by at least 5 Mt a year compared with the business-as-usual scenario.

In addition, the permit allocation method must not favour the highest GHG emitters to the detriment of better-performing recent or future facilities; i.e., it must not segment the power industry to unduly accommodate coal-fired facilities. All things being equal, such segmentation would automatically translate into reduced allocation to other, better-performing renewable and thermal power sources. This could even result in the selection of a performance criterion lower than that of the best gas technologies available (CCGT). The best-performing plants, ironically, would then be forced to purchase permits because of the overly-high share of permits allocated to high emitters. Improper allocation could even render the new high-performance gas-fired technologies uncompetitive compared with the old coal-fired generating stations and thus delay the modernization of Canada's generating fleet.

Recognition of cleaner energy exports

Hydro-Québec supports the government's efforts to achieve recognition of emissions avoided through cleaner energy exports under the Kyoto Protocol. Avoided GHG emissions are a fact and their sources of production are clearly identifiable, even though the power is sold in the rest of Canada and the United States. For example, for the year 2000, net Hydro-Québec exports, mainly to the United States, helped avoid 18 Mt of CO₂, 128,000 tonnes of SO₂ and 65,000 tonnes of NO_x which would have otherwise been emitted by power facilities outside Québec, a large portion of which are fossil-fuel-burning.

Recognition of clean hydro exports should remain in place until a North American tradable permit system can be set up to take over as an incentive to promote renewables. However, Hydro-Québec emphasizes that a mechanism for recognizing cleaner energy exports will be much more profitable if Canada's hydropower potential is adequately developed and if power produced cleanly from water replaces fossil-fuel-based alternatives.