



National Energy Board

Reasons for Decision

Ontario Hydro

EW-3-90

April 1991

Exports of Electricity

National Energy Board

Reasons for Decision

In the Matter of

Ontario Hydro

Application under the National Energy Board Act
for Exports of Electricity to:

The Consumers Power Company
The Detroit Edison Company
General Public Utilities
Minnesota Power
The New York Power Pool
Niagara Mohawk Power Corporation
The State of Vermont

EW-3-90

April 1991

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Abbreviations

Gg	gigagram1 000 000 kilograms
Gg/yr	gigagrams per year
GW	gigawatt1 000 000 kilowatts
GW.h	gigawatt hour1 000 000 kilowatt hours
kV	kilovolt1 000 volts
mw	megawatt1 000 kilowatts
tonne	- 1 000 kilograms
TW.h	terawatt hour1 000 gigawatt hours
CO ₂	Carbon dioxide
NO _x	All nitrogen oxides
SO ₂	Sulphur dioxide
the Act	<i>National Energy Board Act</i>
the Board	National Energy Board
C & C Study	Cherwick and Caverhill Study
CEPA	<i>Canadian Environmental Protection Act</i>
the Citizens	Citizens against Metro Garbage
Coalition	Canadian Coalition on Acid Rain
the Council	London and Area Council of Women
Environmental Groups	Coalition for Environmental Groups
EPA	<i>Ontario Environmental Protection Act</i>
First Nation	Nipigon Ojibway First Nation
MRJBC/NAN/ Treaty No. 3	Moose River James Bay Coalition/ Nishnawbe-Aski Nation/Grand Council Treaty No. 3

N i a g a r a Mohawk	Niagara Mohawk Power Corporation
NYPA	New York Power Authority
NYPP	New York Power Pool
Ontario EAB	Ontario Environmental Assessment Board

Recital and Appearances

IN THE MATTER of the *National Energy Board Act* and the Regulations made thereunder; and

IN THE MATTER of an application by Ontario Hydro for authorizations to export electricity under Part VI of the said Act, filed with the Board under File Number 6200-O001-3.

EXAMINED by means of written submissions.

BEFORE:

R.B. Horner, Q.C.	Presiding Member
R. Priddle	Member
A. Côté-Verhaaf	Member

INTERVENORS:

Alan R Boyce

* Canadian Coalition on Acid Rain

* Citizens Against Metro Garbage

* Coalition of Environmental Groups

* Colleen and William Cooney

* W. Donald Cousens, M.P.P. for Markham

Earthroots Coalition

* Grand Council Treaty No. 3

Robert G. Jones

Mr. & Mrs. D. Gordon Knight

Eugene Knight

* London and Area Council of Women

The Mamaweswen North Shore Tribal Council

* Moose River James Bay Coalition

Stephan D. Neale

New Brunswick Electric Power Commission

* Nipigon Ojibway First Nation

* Nishnawbe-Aski Nation

* Norman E. Richard

Toronto and Area Council of Women

Union of Ontario Indians

United Chiefs and Councils of the Manitoulin

* Intervenors who either presented submissions or raised their concerns in their notices of intervention.

Chapter 1

Preamble

This report describes the information examined by the National Energy Board ("the Board") and the conclusions reached in its examination of the application by Ontario Hydro ("Ontario Hydro" or "the Applicant") dated 10 October 1990 requesting the authorization of various exports of electricity. The purpose of the examination was to determine whether to issue permits authorizing the exports, without a public hearing, or to recommend to the Minister that the Governor in Council designate the application for licensing, which would necessitate a public hearing.

1.1 Procedures Followed In Reviewing the Application

The procedures followed in examining the application were those established in accordance with Bill C-23, *An Act to amend the National Energy Board Act and to repeal certain enactments in consequence thereof*, which came into force on 1 June 1990 and which amended the *National Energy Board Act* ("the Act" or "NEB Act") to implement the September 1988 *Canadian Electricity Policy*. Those procedures are described in the Board's Memorandum of Guidance of 22 June 1990 and were set out, in the case of that application, in Board Order EW-3-90 issued on 14 November 1990.

In conducting the examination, the Board sought to avoid duplication of measures taken by the Applicant or by the government of Ontario and had regard to all considerations that appeared to it to be relevant. These considerations included:

- (a) the effect of the exports on provinces other than Ontario;
- (b) the impact of the exports on the environment; and
- (c) whether the applicant has
 - (i) informed those who have declared an interest in buying electricity for consumption in Canada of the quantities and classes of service available for sale, and
 - (ii) given an opportunity to purchase electricity on terms and conditions as favourable as the terms and conditions specified in the applications to those who, within a reasonable time after being so informed, demonstrate an intention to buy electricity for consumption in Canada.

The process described in paragraph (c) is referred to hereafter as providing fair market access.

As part of its examination, the Board sought the views of interested parties, including the general public. Along with the application, the Board has considered other information that it required the Applicant to furnish and the Applicant's responses to the submissions received from interested parties.

1.2 Environmental Screening of the Proposed Exports

The Board's examination of this application pursuant to subsection 119.06(2) of the NEB Act included an assessment of the environmental impact of Ontario Hydro's export proposals. Given the comprehensive scope of that assessment and the fact that it formed part of the public process by which those export proposals were considered, the Board decided that, to avoid duplication, the screening of those proposals in accordance with the *Environmental Assessment and Review Process Guidelines Order* ("EARP Order") would be incorporated into this proceeding. Accordingly, the Board's findings on the environmental impact of those export proposals that are set out in this report also apply as findings by the Board pursuant to section 12 of the EARP Order.

Chapter 2

Background

2.1 The Applicant

Ontario Hydro is a corporation operating under the authority of the *Power Corporation Act*, R.S.O. 1980, Chapter 384, as amended, with broad powers to generate, supply and deliver electric power throughout the province of Ontario.

Ontario Hydro's power is generated from hydraulic, fossil and nuclear sources. By 1993, the Applicant will have a total in-service capacity of 32 400 MW, including 350 MW of non-utility generation; and 1556 MW of mothballed capacity. The company projects that by that year 23 percent of its annual energy production will be hydraulic, 15 percent fossil fuel, and 62 percent nuclear.

The provincial transmission grid consists of integrated 500 kV and 230 kV networks, with regional extensions along 115 kV networks. With this transmission grid Ontario Hydro serves 850 000 rural retail customers and 316 municipal utilities which distribute electricity to three million homes and businesses throughout Ontario. It also sells power to 105 industrial customers, supplied directly from the 115 and 230 kV transmission networks.

Within Canada, Ontario Hydro is radially interconnected with isolated regions or generating plants in Québec and with Manitoba Hydro by two 230 kV circuits and one 115 kV radial circuit. Ontario Hydro's system is also interconnected with the systems of New York Power Authority ("NYPA"), Niagara Mohawk Power Corporation ("Niagara Mohawk"), and The Detroit Edison Company in the United States.

Power and energy are presently exported to the United States under two existing interruptible and miscellaneous firm licences, for a total of up to 25 000 GW.h of exports in any consecutive 12-month period. In addition, small amounts of firm power and energy are exported under several existing export orders.

2.2 Export Markets

Ontario Hydro's principal export markets are in the States of New York and Michigan. In addition, Ontario Hydro can also supply power and energy to a large number of second-tier customers. Exports to these markets would be wheeled through either New York or Michigan.

2.3 The Export Customers

Ontario Hydro has entered into contractual arrangements with the following export customers.

- The Power Authority of the State of New York, a state agency carrying on business under the name of New York Power Authority, supplies about 24% (1989: 34.6 TW.h) of that state's electricity needs, both as an electricity wholesaler and a direct supplier, and is an associate member of the New York Power Pool ("NYPP).

- Niagara Mohawk Power Corporation is an investor-owned utility, with a membership in the NYPP, serving approximately 1.5 million customers in the State of New York.
- The New York Power Pool services the majority of the New York State area. It includes NYPA, Niagara Mohawk, Central Hudson Gas and Electric Corporation, Consolidated Edison Company of New York Inc., Long Island Lighting Company, New York State Electric and Gas Corporation, Orange and Rockland Utilities, Inc. and Rochester Gas and Electric Corporation.
- The Consumers Power Company is an investor-owned utility which services the majority of the Michigan State area east of Lake Michigan. The company supplies electricity to approximately 1.5 million customers.
- The Detroit Edison Company is an investor-owned utility which services the city of Detroit and surrounding area. The company supplies electricity to approximately 1.9 million customers.
- General Public Utilities is an investor-owned utility servicing about half of Pennsylvania and New Jersey, approximately 1.8 million customers.
- Minnesota Power is a diversified investor-owned utility which services approximately 120 000 customers in northeastern and central Minnesota.
- The Vermont Department of Public Service (VDPS) is a public advocate for the State of Vermont and oversees utility activities within the State. One of the responsibilities of the VDPS is to purchase power on behalf of the State. There are currently 24 distribution utilities in the State of Vermont, including seven investor-owned utilities, 15 public/municipal utilities and two independent rural cooperatives.

Information on the capability and load of these American utilities is given in Appendix 1.

Chapter 3

Requested Authorizations

Ontario Hydro sought the following export authorizations to continue currently approved transactions over existing international power lines:

- Part 1 of the application requests a permit to export up to 15 TW.h per year of interruptible energy for the 15-year period from 1 July 1991 to 30 June 2006. This permit would replace existing Licence EL-136 which expires 30 June 1991.

The exports would be made in accordance with existing agreements with The Consumers Power Company, The Detroit Edison Company, General Public Utilities, Minnesota Power, The New York Power Pool, Niagara Mohawk Power Corporation, New York Power Authority and the State of Vermont.

Ontario Hydro has stated that there may also be times when specific commitments are made to export power and energy outside the terms and conditions of existing agreements. If this is so, separate approvals would be sought from the Board and the export quantities would be included as part of the 15 TW.h per year allowable maximum proposed for interruptible export.

- Part 2 of the application requests a permit to export up to 10 TW.h per year, for a 30-year period from 1 January 1996 to 31 December 2025, in order to account for unavoidable and unscheduled circulating power flows resulting from the operation of the Ontario Hydro system as part of an interconnected grid. This permit would replace Licence EL-134 which expires 31 December 1995.
- Part 3 of the application requests a permit to export to the State of Vermont 112 MW of firm power and 1320 GW.h of firm energy during the 16-month period from 1 July 1991 to 31 October 1992, in accordance with the terms of an existing agreement expiring 31 October 1992.

This export is currently made under Miscellaneous Firm Licence EL-135 which expires 30 June 1991 and which, according to Ontario Hydro, will not be renewed in the foreseeable future.

In addition, the combined total allowable annual export under Parts 1 and 3 of the application would be limited to the 15 TW.h applied for under Part 1 of the application.

- Part 4 of the application requests a permit to supply, as an essential station service, up to 3 MW of firm power and up to 15 GW.h per annum of firm energy, to NYPA for the Iroquois Control Dam, for the 30-year period from 1 July 1991 to 30 June 2021 in accordance with the existing agreement dated October 1961. This permit would replace Order ELO-273 which expires 31 March 1993.

Ontario Hydro also requested that the Board rescind Order ELO-273 upon granting the requested permit.

- Part 5 of the application requests a permit to export up to 0.1 MW of firm power and up to 200 MW.h per annum of firm energy, to supply residential customers, as a border accommodation, from 15 May 1991 to 14 May 2021. This permit would replace Order ELO-238 which expires 14 May 1991.

Chapter 4

Information Supplied by the Applicant

4.1 Early Public Notification

Public notification, by an applicant for export authorizations, is required by the Act and by the Board's Memorandum of Guidance Concerning Early Publication of Proposed Applications ("the MOG"). Section 119.04 of the Act requires that notice of the application be published in the Canada Gazette. The MOG requires that an applicant implement a public information program to explain the proposal under review, provide interested parties adequate time to comment on the application and respond to any relevant questions that may be raised.

The application to the Board is dated 10 October 1990. On 26 September 1990, Ontario Hydro published a Public Notice, advising of its application to the Board, in forty-two Ontario newspapers, one in Manitoba and one in Quebec. That notice outlined the application, provided the address of Ontario Hydro's central and regional offices where the application could be viewed and the name of a person to whom inquiries could be forwarded. Along with that notice, Ontario Hydro issued a news release further describing the application being filed. Also, on 20 October 1990 Ontario Hydro published a notice of its application in the Canada Gazette.

Following the notification procedures, Ontario Hydro received thirteen responses from the public: six telephone requests and seven written inquiries from six individuals. Those queries focussed on several issues including: Ontario Hydro's 25 Year Demand/Supply Plan Report; the relationship of Ontario Hydro's conservation efforts to the proposed exports; clarification of the export components; and the environmental implications of generation for exports. As part of its public notification program Ontario Hydro also responded to all inquiries submitted by interested parties.

4.2 Provincial Environmental Review and Other Required Approvals

The requested export approvals come at a time when Ontario Hydro also is seeking, through the Ontario Environmental Assessment Board ("Ontario EAB"), approval from the government of Ontario for its 25 Year Demand/Supply Plan Report. That report sets out the requirement and rationale for future generation and transmission facilities to meet existing and forecast electricity requirements in Ontario.

In December of 1989, Ontario Hydro started the process for Ontario EAB approval by initiating a comprehensive public consultation program concerning its Demand/Supply Plan Report. To date, intervenor funding for participation at the Ontario EAB hearing has been established for a two-year period; Ontario Hydro has established nine panels for presentation of evidence at the hearing; and the Ontario EAB has established a preliminary schedule for the period up to December 1991 which involves four of those nine panels.

Ontario Hydro noted that the Ontario EAB hearing will result only in approval of the requirement and rationale for future energy supply strategies to meet forecast demand. Facility additions to implement

the approved strategy will be subject to further individual environmental assessments and approvals in accordance with provincial requirements.

Section 69 of the *Power Corporation Act* authorizes Ontario Hydro to enter into electricity export contracts. Pursuant to that Act, all export activities are subject to specific approval of the Lieutenant Governor in Council. Ontario Hydro stated that all such approvals related to the proposed exports have already been obtained as the exports would be undertaken pursuant to existing contracts and interconnection agreements. Ontario Hydro also submitted a letter to the Board from the Ontario Ministry of Energy indicating that the Ministry was satisfied that the proposed exports were in accordance with the *Power Corporation Act* and was supporting Ontario Hydro's application before the Board.

Regarding the authorization of imports to the United States, Ontario Hydro indicated that the importing utilities already have the requisite approvals ("Presidential Permits" with respect to international power lines and "Orders" with respect to contracts and transaction agreements) and do not require any additional government approval. The Applicant also indicated that it would undertake to file with the Board a list of those approvals and the conditions governing the purchase of electricity under them.

4.3 Environmental Standards and Guidelines Applicable to Ontario Hydro's Generation

Ontario Hydro submitted information indicating that all of its generation must meet the same environmental standards and guidelines whether or not it is producing electricity for export.

With respect to air emissions, particularly sulphur dioxide ("SO₂") and nitrogen oxides ("NO_x") which are the principal contributors to acidic deposition, Ontario Regulation 281/87-*Ontario Hydro Regulation* and Regulation 296-*Ambient Air Quality Criteria Regulation* under the *Ontario Environmental Protection Act* ("the EPA") represent the predominate control mechanisms for Ontario Hydro's fossil-fired facilities. In addition, Regulation 308 - *General-Air Pollution Regulation* of the EPA governs the opacity of flue gas from solid fuel combustion facilities.

Regulation 281/87 establishes SO₂ and NO_x emission limits in gigagrams per year ("Gg/yr") established pursuant to the *Canada/Ontario Agreement Respecting A Sulphur Dioxide Reduction Program* signed 10 March 1987, applicable to Ontario Hydro's fossil-fuel fired facilities. Those limits have been established at a combined total of 280 Gg/yr (240 Gg/yr for SO₂ and 40 Gg/yr for NO_x) to 1993 and a combined total of 215 Gg/yr (175 for SO₂ and 40 Gg/yr for NO_x) in any year after 1993.

Regulation 296 establishes ambient air quality criteria applicable to Ontario Hydro's fossil-fired facilities. That regulation establishes point source emission limits for a variety of air contaminants over periods of 1 hour, 8 hours, 24 hours, 30 days and one year. Those contaminants include, among others, SO₂, NO_x and particulates for which emission limit objectives also have been set out under the Ambient Air Quality Objectives pursuant to the *Canadian Environmental Protection Act* ("CEPA"). The emission limits established by Regulation 296 are more stringent, or are equivalent to the objectives set out under the CEPA for those parameters.

Other operational measures applicable to Ontario Hydro facilities which are implemented under the EPA are set out under Operational Certificates, Program Approvals and Air Quality Control

Guidelines. In addition, under the Ontario *Water Resources Act*, controls are implemented for cooling water emissions from stations and, currently, the Municipal Industrial Abatement Strategy under that Act requires the implementation of standard effluent testing procedures for a one-year period to establish emission limits and control mechanisms based on best available technology.

Provincial regulations under the EPA establish controls on the disposal of fly-ash captured from the burning of fossil fuels by Ontario Hydro. Those regulations and the procedures established pursuant to the Ontario *Environmental Assessment Act* govern the site-selection process for new disposal sites, where the sale of fly-ash or on-site disposal are not viable options.

For nuclear generation, acceptable levels of radioactive emissions and procedures for the handling and storage of spent fuel are developed and implemented by the Atomic Energy Control Board.

4.4 Monitoring and Control of Plant Emissions

The majority of the proposed exports will be generated by the Lakeview, Lambton and Nanticoke thermal generating stations. Monitoring of emissions, by Ontario Hydro and the Ontario Ministry of Environment, is conducted at twelve stations for the Lakeview plant, six stations for the Lambton plant and eleven stations for the Nanticoke plant. In addition, Ontario Hydro referenced the use of a mobile monitoring station which is used to track ground level SO₂ emitted from the Lakeview facility. Emission monitoring is carried out to comply with Regulation 308-*General - Air Pollution Regulation*, Regulation 296- *Ambient Air Quality Criteria Regulation*, Regulation 151/81-*Lambton Industry Meteorological Alert* and, in the case of Lakeview, to comply with voluntary controls established pursuant to the objectives of the EPA. Ontario Hydro effects compliance with these regulations through a system of internal control and monitoring measures.

Ontario Hydro's *State of the Environment Report - 1989* indicated that during 1989 there were several instances when emissions exceeded the prescribed limit, in particular, SO₂ emissions during twelve hourly periods out of a total of 207 000 sampling hours and particulate emissions for up to 3.6% of total operating time. However, this report also indicated that mitigative measures will be taken such as flue gas conditioning, acid gas desulphurization programs and the implementation of mobile monitoring programs. In addition, Ontario Hydro is participating in lime spray dryer studies in the U.S. and has developed pilot project studies for the use of urea to control NO_x.

For nuclear plants radioactive emissions are monitored by both Ontario Hydro and the Atomic Energy Control Board. The information provided indicated that those emissions are within acceptable safety levels.

4.5 Demand/Supply Plan

Ontario Hydro filed with the Board a report entitled "Providing the Balance of Power" which constitutes the utility's Demand/Supply Plan proposal to meet electricity requirements in Ontario over the 25-year period from 1989 to 2014. The Plan, based on the 1988 load forecast, assesses Ontario's future needs for new demand and supply options to account for the retirement of generating facilities as well as the expected increase in demand. Ontario Hydro also stated that no new generation beyond the Darlington nuclear plant has been approved at this time.

To take into account load forecast uncertainty, Ontario Hydro provided, in addition to its median forecast, lower and upper boundary forecasts.

These boundary forecasts are expected to encompass 80% of all possible future load outcomes.

Under the median forecast scenario, information supplied by the Applicant indicates that demand exceeds existing system capability by 1993 for both capacity and energy. Thus, 1993 is the date by which new demand/supply options appear to be required. Options outlined by the Applicant include demand management, non-utility generation, hydraulic rehabilitation and major supply additions.

Ontario Hydro's demand management plan is designed to reduce demand by increasing electricity utilization efficiencies and by shifting loads away from peak periods. Under the median forecast case, the Applicant expects the demand reducing options to defer the need for new capacity by four years (i.e. to 1997) and for new energy supply by two years (i.e. to 1995).

Before an evaluation of the requirement for major new supply was made, an assessment of the potential for obtaining additional supplies from non-utility generators and from the economic development of Ontario Hydro's hydraulic resources was carried out. Under the median forecast scenario, hydraulic resources and purchased non-utility generation might defer the need for major supply options to the year 2000 for capacity and to 1998 for energy.

Ontario Hydro examined 14 major supply options and selected three which satisfy its planning criteria which include, among others, factors related to economics, safety, reliability, diversity and the environment. The major supply options examined include: purchases of electricity from neighbouring utilities; generation by fossil-fuelled plants; and CANDU nuclear generation. The environmental evaluation of the supply options included consideration of emissions of acid gases, greenhouse gases and radioactivity emissions.

4.6 The Impact of the Exportation on the Environment

4.6.1 Sources of the Electricity for Export

Ontario Hydro's existing system consists of a mix of nuclear, hydraulic and fossil-fired generation.

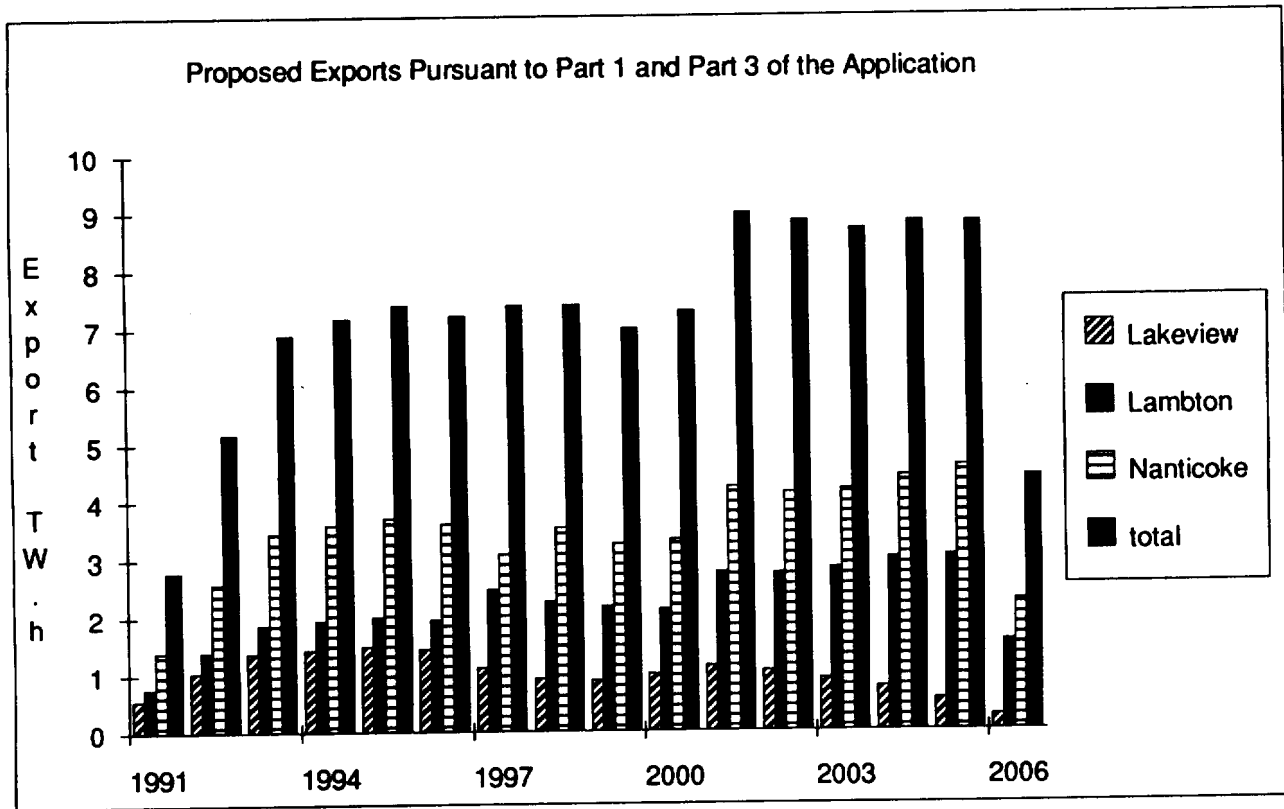
The nuclear and part of the hydraulic generation is base-loaded while the remaining hydraulic is used to meet the peak demand. The fossil-fired generation is used for intermediate loads. In its application to the Board, Ontario Hydro stated that the proposed exports would be supplied by fossil and nuclear generating plants.

Ontario Hydro anticipates that, within the limits of current emission controls, it will be able to generate enough fossil-fired energy to meet domestic demand and maintain a planned 9 TW.h annual margin to allow for system contingencies. That margin would be available for export if contingencies do not materialize. About 90% of the fossil fired exports would be supplied from the Nanticoke, Lambton and Lakeview plants, while 10% would come from the remaining fossil-fired plants. All those plants, with the exception of Lennox, are coal-fired. Ontario Hydro also stated that additional energy could be available for export under certain system conditions (other than the most probable forecast), without exceeding the legislated emission limits.

Ontario Hydro supplied updated information regarding the projections of fossil-fired generation with and without forecast exports, based on its most recent load and supply forecast (October 1990) and on its latest plan with respect to emission control facilities. The proposed exports from fossil-fuelled sources, pursuant to Part 1 and Part 3 of the application, vary during the requested export period between 5 and 9 TW.h as shown in Figure 1.

Ontario Hydro indicated that from time to time there could be situations in which exports could be supplied from other than fossil or nuclear sources. Thus, although no energy purchases are forecast specifically to supply exports, portions of capacity and/or energy purchases made to meet its own system requirements (i.e. purchases from Manitoba Hydro and non-utility generators) could become available to supply exports in presently unforeseeable circumstances.

Figure 1



Note: Quantities for 1991 and 2006 are for a 6 month period only.

During the export period proposed under Part 1 of the application, new generating facilities will be needed to meet the forecast demand in the province. Ontario Hydro stated that there may be periods during which energy generated by new facilities, being surplus to system needs, could be exported, although such facilities were not built with the intention to export.

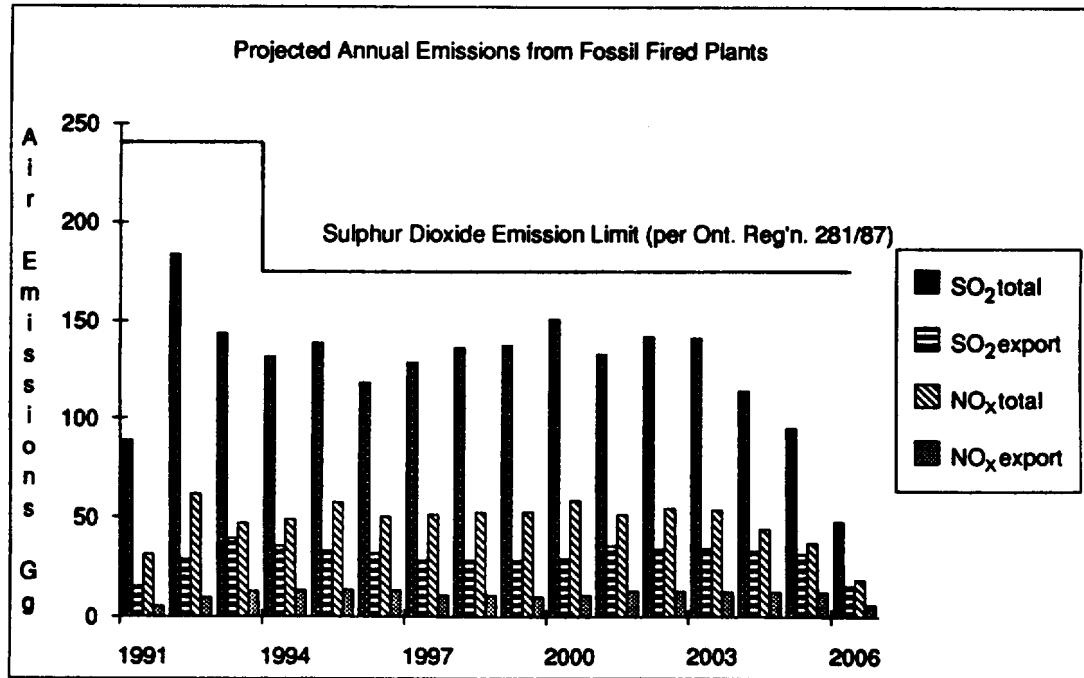
4.6.2 Environmental Impact of the Exports

As mentioned in section 4.6.1, Ontario Hydro stated that the proposed electricity exports would be supplied by fossil and nuclear generating sources with the primary source of supply being fossil-fired generation. Atmospheric emissions from fossil-fired generating plants include SO₂, NO_x and particulate matter. Emissions Of SO₂ and NO_x contribute to acidic deposition.

Ontario Hydro stated that the emissions resulting from meeting the domestic demand and the proposed exports by the use of fossil-fired energy must be within the limits imposed by Ontario Regulation 281/87. To comply with those regulations Ontario Hydro initiated an acid gas abatement plan consisting of installation of flue gas conditioning (to allow burning of lower-sulphurcoal) and flue gas desulphurization (scrubbers) at its coal-fired generating plants.

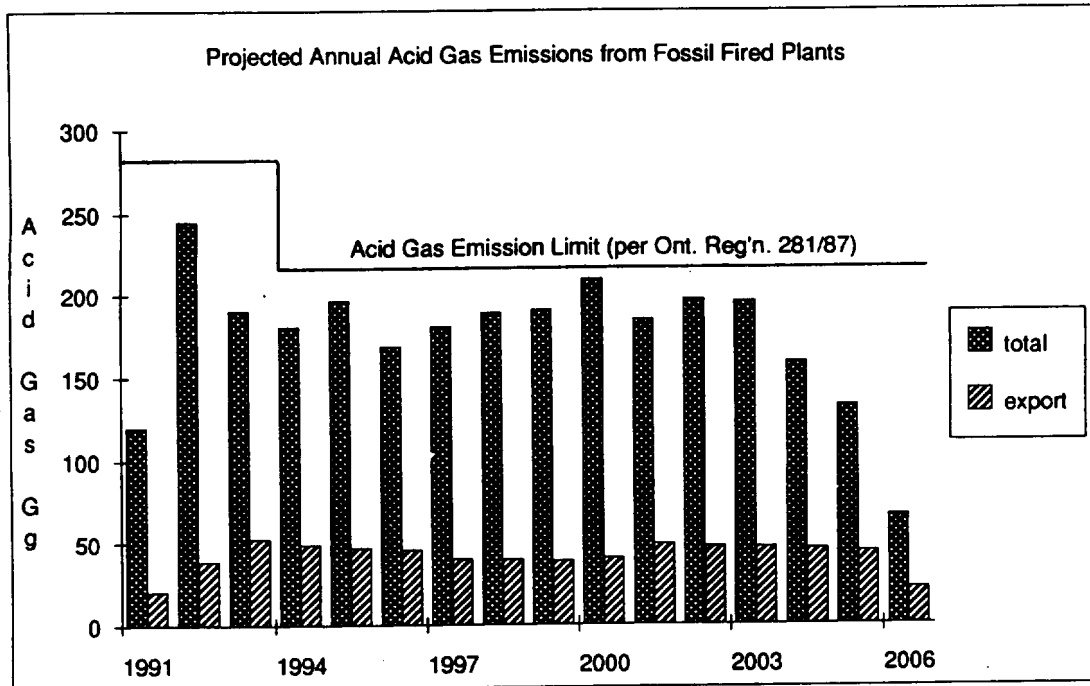
Ontario Hydro provided information with respect to the annual emissions of contaminants from fossil-fired generating plants over the period for which an authorization under Part 1 of the application for 15 TW.h of annual exports is requested, with and without the inclusion of the proposed exports. That information is based on the most recent load and supply forecast as well as on the latest plan for emission control facilities. The cap imposed on acid gas emissions by provincial regulations has also been taken into account. Ontario Hydro anticipates that it could generate fossil-fired energy as required to meet the domestic demand and maintain an annual margin of 9 TW.h while respecting the acid gas limits. That margin could be used to supply the proposed exports. Figures 2 and 3 show the projected annual emissions from fossil-fired generating plants and the resultant acid gas emissions when up to 9 TW.h per year of fossil-fired energy are exported.

Figure 2



Note: Quantities for 1991 and 2006 are for a 6 month period only.
Total = domestic + export.

Figure 3



Note: Quantities for 1991 and 2006 are for a 6 month period only.
Total = domestic + export.

Although Ontario Hydro provided environmental information in respect of only 9 TW.h of fossil-fired exports, it also indicated that a level of 15 TW.h of export sales could be achieved in a combination of circumstances - such as higher than forecast nuclear and/or hydraulic output or lower domestic demand - but such a level would not under any circumstances result in an increase in acid gas emissions beyond the legislated cap.

The significance of emissions of CO₂, one of the greenhouse gases, was brought to national and international attention through the 1988 International Climate Conference. The Conference, among other initiatives, sought the reduction of CO₂ emissions by 20% of 1988 levels by the year 2005. In 1989 Ontario Hydro concluded that, under a median load growth scenario, it could achieve that reduction within the specified timeframe if demand management and non-utility and hydraulic generation options were implemented and if additional nuclear generation were to be constructed.

Further evaluation of five selected plans, set out in its Demand/Supply Plan proposal, indicated that three plans could meet the CO₂ reduction objective under median load growth and existing conditions. Additional reductions could be achieved through coal-fired plant replacements and conversion of combustion turbines to combined-cycle systems.

It was also Ontario Hydro's position that CO₂ resulting from fossil-fuel burned in Ontario for the export of electricity will very likely displace CO₂ produced by fossil-fuel burned in the United States, resulting in no net increase in CO₂ emissions. Furthermore, it was the Applicant's position that, to the extent that the exports are supplied from nuclear or hydraulic energy, global CO₂ emissions will be reduced.

Ontario Hydro's nuclear generating plants are a source of radioactive emissions to water and air. The Atomic Energy Control Board regulates the release of such emissions and sets limits for each nuclear plant. Ontario Hydro stated that its operating targets for each emission category are less than 1% of the regulatory limit. Ontario Hydro further indicated that, even if the International Commission on Radiation Protection recommended reductions of standards by up to a factor of 10, its self-imposed standards of 1% of regulated emission limits would still allow for the development of the supply option having the largest nuclear generation component.

Turning to the environmental impact of the proposed exports on the buyers' systems, the Applicant noted that it would be difficult to determine the type of generation displaced by particular transactions because of the cascading effect on displaced generation associated with the bulk of the exports. For example, in the case of a weekly purchase of capacity and energy by a New York utility, the alternative to a purchase from Ontario Hydro could be a purchase from a Pennsylvania utility which in turn might purchase cheaper coal-fired generation from Ohio. In addition, the purchased generation might be resold so that there is no impact on New York generation, but some generation is ultimately displaced in New England. It would therefore be virtually impossible, even after the fact, to determine the end of the chain reaction for each individual transaction. Without this information it is impossible to determine the impact of the displaced generation since this evaluation is a function of factors such as the physical location of the plant, the fuel used, plant vintage and emission control equipment utilized at the site.

Notwithstanding the difficulty in determining the displaced generation, it was the Applicant's view that the electricity proposed for export would replace electricity that would otherwise be produced by fossil-fired generation in the United States with similar environmental impacts. To support its view,

the Applicant provided some information on the average SO₂ emission rates for generation that would be displaced in the export market and for its own generation. This information showed that, in general, emission rates attributable to generating facilities within Ontario were somewhat lower than corresponding rates in the United States market area.

Regarding the question of social effects directly related to be proposed exports, Ontario Hydro took the position that any negative social effect would be insignificant and, in any case, would be adequately compensated for since the export price would recover all projected social costs.¹

4.7 The Effects of the Exports Outside of Ontario

Ontario Hydro stated that, as a member of the Northeast Power Coordinating Council ("NPCC"), it complied with all safety and reliability standards of that council. Therefore, it was Ontario Hydro's view that neither the operation of its system with or without the proposed expositions, nor the occurrence of any NPCC criteria contingency on the system, would have any negative reliability impacts on neighbouring interconnected utilities.

Ontario Hydro also supplied information related to the potential environmental impact on neighbouring systems of the proposed exports. The information indicated that the environmental impact outside of Ontario would be similar or somewhat less than the impact if the exports were not authorized. This is because, in general, if the proposed exports did not occur, the purchaser's alternative would be to rely either on similar types of fossil-fired generating plants as operated by Ontario Hydro or on purchases of energy from other suppliers generated by even more polluting fossil-fired plants.

4.8 Fair Market Access

In regard to the proposed export under Part 1 of the application, Ontario Hydro stated that it will continue to offer all interruptible exports to neighbouring Canadian utilities and to grant interception rights to those utilities. To demonstrate this, letters setting out procedures for the provision of fair market access were sent to all contiguous Canadian utilities. Those utilities, namely Canadian Niagara Power Company, Great Lakes Power Company, Hydro-Quebec and Manitoba Hydro, all indicated their general concurrence with the procedure proposed by the Applicant.

It was Ontario Hydro's position that fair market access was not applicable to the proposed exports under Parts 2, 3, 4 and 5 of the application. According to the Applicant's position, fair market access could not be technically provided in relation to Part 2 of the application, circulating power flows. In relation to Parts 4 and 5 of the application, consisting of border accommodation transfers, it was inappropriate to apply fair market access given the small quantities and specific circumstances of each. Concerning Part 3 of the application, the requested firm export to Vermont, would be a continuation of an existing export for which offers to neighbouring Canadian utilities had previously been made. In

¹ Social Cost Studies were included in the supporting information provided by the Applicant. Those studies assess the cost to the environment of generating electricity for export. According to those studies, the most likely incremental cost per unit of exported electrical generation is 0.482 cents per kilowatt hour for fossil fuels and 0.001 cents per kilowatt hour for nuclear sources. These costs are significantly lower than expected export prices.

addition, neighbouring utilities had been served copies of the application and had indicated no interest in the Vermont export.

Chapter 5

Interventions, Submissions and the Applicant's Responses

5.1 Interventions

The Board received 22 interventions in respect of the application. Many of the intervenors filed detailed written submissions to elaborate on the concerns set out in their interventions. The 21 interventions from environmental groups and private citizens were generally opposed to the exports and/or requested that a public hearing be held. One intervenor, a Canadian utility, supported the application.

Ontario Hydro has responded to the nine intervenors who raised specific concerns either in their submissions or interventions.

5.2 Submissions and Responses

5.2.1 Canadian Coalition on Acid Rain ("Coalition")

The Coalition stated that the fossil-fuel generating capacity of Ontario Hydro is one of the major Canadian sources causing acid gas emissions and therefore contributing to the acid rain problem.

In its submission, the Coalition requested that the Board, through the hearing process, determine unequivocally that the proposed exports will not affect Ontario Hydro's ability to meet the conditions of Ontario Regulation 281/87 which regulates acid gas emissions. The Coalition was also of the view that a hearing is necessary to allow a thorough review of Ontario Hydro's application by the Board and by independent interested parties.

In response, the Applicant stated that the Ontario Hydro Acid Gas Abatement Program is designed to allow Ontario Hydro to generate energy to meet domestic demand while complying with the provisions of Ontario Regulation 281/87. Ontario Hydro stated that it has and it will continue to comply with Ontario Regulation 281/87 even at the cost of curbing exports. Ontario Hydro also confirmed that it has complied with Ontario Regulation 281/87 for the year 1990, with acid gas emissions for the year totalling 245 Gg, compared to the regulated limit of 280 Gg.

5.2.2 Citizens against Metro Garbage ("the Citizens")

The Citizens objected to the proposed exports on the grounds that Ontario Hydro does not have a comprehensive management system in place to dispose of its present production of coal and fly ash. Their intervention was primarily concerned with the possibility of disposing of coal ash from the Lakeview generating station in the Uhthoff Quarry. The Citizens requested that the Board dismiss the application or recommend to the Governor in Council that the application be subject to a licence proceeding which would involve a public hearing.

In reply, Ontario Hydro admitted that the Uhthoff Quarry is one of the sites considered as a potential contingency disposal site for ash produced at the Lakeview station. The potential use of the Uhthoff Quarry for ash disposal, as well as the final choice of a site, is not a function of exports but rather of the long term need to find a location to dispose of ash produced at Lakeview. While some of the proposed exports will come from Lakeview, the station's primary function is to meet domestic power requirements. Any site selected for disposal of ash will be subject to the provincial environmental assessment process.

5.2.3 Coalition of Environmental Groups ("Environmental Groups")

This intervenor submitted that the proposed interruptible exports and the proposed firm exports to Vermont will cause considerable adverse environmental impact and, consequently, that there should be a full environmental assessment and review before any permit is issued and that such review should take place after the Ontario EAB review of Ontario Hydro's Demand/Supply Plan is completed.

The Environmental Groups stated that the values that Ontario Hydro has placed upon externalities, in its prefiled material, are considerably lower than the estimates contained in the latest studies and regulatory decisions elsewhere. It also raised issues related to the methodology used and the completeness of Ontario Hydro's social cost studies. In support of this argument, the Environmental Groups filed a study on the adequacy of Ontario Hydro's estimates of externalities associated with electricity exports.

In respect of the social cost studies submitted as part of its application, the Applicant replied that the methods used address the specific issue of incremental social costs as a result of exports and deal directly with the issue before the Board; while the above study ignores the fact that many costs incurred in exporting electricity are incremental only, and cannot be compared to studies which consider total generation.

5.2.4 Colleen and William Cooney

In their submission, these intervenors raised the issue of possible environmental damage resulting from the selection of a site for ash disposal from the Lakeview generating station and, in particular, the use of the Uhthoff Quarry. They also addressed the greenhouse effect, acid rain and various issues associated with nuclear industry. They also suggested that these potential environmental impacts warrant a full environmental assessment and review to be conducted following the Ontario EAB review.

In addressing the potential use of the Uhthoff Quarry, Ontario Hydro gave the same response as the one given to the Citizens reported in section 5.2.2 of this report.

It was the Applicant's view that, having regard to the global nature of the greenhouse effect, consideration of CO₂ emissions are not relevant to the present application. With regard to nuclear issues, Ontario Hydro's social cost studies evaluate all of the environmental impacts associated with possible power exports from nuclear generating stations.

5.2.5 W. Donald Cousens, MPP

W. Donald Cousens was concerned with the potential impact the proposed exports might have on the environment. According to this intervenor, since the primary source proposed for export will be fossil-fired generation, it is important to limit damage caused by SO₂ emissions resulting from this type of generation. This intervenor recognized that Ontario Hydro continues to make efforts to reduce acid gas emissions, nevertheless, he requested that the Board's approval be predicated on complete adherence to Ontario Regulation 281/87 pertaining to acid gas emissions until and beyond 1994.

In response, Ontario Hydro reiterated that it will comply with Ontario Regulation 281/87 and any future Ontario Government emission regulations. This commitment applied to all Ontario Hydro activities not just to exports. If additional fossil fired generation is required for domestic consumption, exports would be curtailed as was the case in 1989 and 1990.

5.2.6 London and Area Council of Women ("the Council")

The Council was concerned with the incremental environmental effects of exports from fossil and nuclear sources. It has suggested that Ontario Hydro adapt alternative methods of generating electricity and recommended that a public hearing be held to review the impact of exports from fossil-fuel and nuclear plants.

In its response, the Applicant stated that it has recognized that the exports from fossil or nuclear sources could have incremental environmental effects, and consequently the social cost studies adequately addressed that issue.

According to the Applicant, the question of future generation was not a subject matter of the present application.

5.2.7 Moose River James Bay Coalition/Nishnawbe-Aski Nation/Grand Council Treaty No. 3 ("MRJBC/NAN/Treaty No. 3")

These three groups represent approximately 45 000 aboriginal people residing in Northern Ontario. These intervenors were primarily concerned that power purchased from Manitoba or generated by new developments in the Moose River Basin will be exported, resulting in adverse environmental effects. In addition, they were concerned about the future role of the Moose River Basin in providing peaking capacity for the Ontario Hydro system.

The submission presented by MRJBC/NAN/Treaty No. 3 raised three specific issues:

- (a) The information submitted by Ontario Hydro is insufficient to allow for a comprehensive review of the impact of the proposed non-firm exports on the development and operation of the Ontario Hydro system. In particular, consideration of environmental impacts of non-firm exports from supply resources such as hydraulic-generation and power purchases are excluded.
- (b) The impacts of proposed non-firm exports on the design and operation of the proposed Manitoba-Ontario interconnection and affiliated firm and non-firm power purchases could have significant environmental implications.

- (c) Non-firm exports could have significant impacts on the design and operation of the existing and proposed hydraulic developments in the Moose River Basin, and these impacts could have significant environmental implications.

In support of the intervention, the MRJBC/NAN/ Treaty No. 3 filed a document prepared by a consultant commenting on the supply resources and the environmental effects of the proposed exports. It also filed a letter from a consultant commenting on the effects of the proposed exports on the hydro-logic regime of the Moose River.

In response, Ontario Hydro stated that:

- (a) sufficient information has been provided regarding the social and environmental costs of the proposed export activity. The Ontario Hydro system is not and will not be a predominantly hydraulic system during the term of the proposed export permits. Even if the proposed and yet unapproved hydraulic resources in the Moose River Basin were included, the system will still be predominantly nuclear and fossil, with hydraulic representing only slightly more than one-fifth of the total system generation. As such, coal will remain as the source of supply for most of the proposed exports because, by definition, the energy for exports comes from marginal sources. It is inappropriate, therefore, to compare the operation of the Ontario Hydro system to that of a predominantly hydraulic system such as Hydro Quebec's, which does export hydraulic energy most of the time. Therefore, hydraulic social costs are not relevant to this Application.
- (b) the proposed non-firm exports will not have an impact on the design of the proposed Manitoba-Ontario transmission line. The Manitoba Purchase of firm capacity and energy and supplemental energy was negotiated to meet domestic demand without regard to exports. Moreover, the decision to rate the transmission line and equipment at 1500 MW was not made in contemplation of facilitating export sales to the United States from purchases of non-firm energy from Manitoba.
- (c) the proposed non-firm exports do not have any significant impact on the design and operation of the existing and proposed hydraulic developments in the Moose River Basin, and, therefore, would not have environmental impacts.

5.2.8 Nipigon Ojibway First Nation ("First Nation")

This intervenor was mainly concerned with the Little Jackfish River hydraulic project in relation to the potential environmental impact on an area which may be subject to a comprehensive land claim by this First Nation. It was noted that if a surplus of electricity is available in Ontario for export, there should be no need for any further hydraulic projects.

In response, the Applicant indicated that the need for all future generation including hydraulic projects is determined on the basis of domestic electricity requirements, not exports. The Little Jackfish River project will be subject to an environmental assessment. If approved and built, the project will be operated for domestic power needs and not exports. The Applicant also explained that exports will be mainly from coal-fired generation, occasionally from nuclear sources and only very rarely from hydraulic sources.

5.2.9 Norman E. Richard

This intervenor objected to the proposed exports of electricity on the ground of the impact on the environment, in particular the incremental emissions of acid gas which increase acid rain production.

Ontario Hydro responded that it monitors acid gas emissions during the year and operates the power system so as to meet acid gas limits. Ontario Hydro has and will continue to comply with Ontario Regulation 281/87, which sets acid gas emission limits, and any future regulations. The impact of incremental acid gas emissions resulting from exports is the subject of social cost studies filed by Ontario Hydro as part of its application to the Board.

Chapter 6

Views of the Board

The provisions of the Act require that, in determining whether to recommend to the Minister that an application be designated by the Governor in Council for licensing, the Board shall have regard to all relevant considerations, including the effect of the proposed exportation on other provinces, its impact on the environment and fair market access.

The Board has given consideration to all the information submitted by Ontario Hydro and to the submissions presented to it and has reached the following conclusions:

6.1 Early Public Notification

The Board notes Ontario Hydro's efforts to provide early public notification of its export application by putting advertisements in daily newspapers and issuing a news release. The Board also notes that Ontario Hydro followed up on this program by responding to all telephone and written inquiries for additional information. The Board is satisfied that these initiatives provided an opportunity for timely public input.

6.2 Provincial Environmental Approval and Other Required Approvals

Ontario Hydro has obtained provincial government approval for any purchase or sales agreements related to the proposed exports that have been entered into with other interconnected systems. In addition the Board accepts the information provided by Ontario Hydro that all relevant approvals required to import electricity into the U.S. have been obtained by the purchasing utilities. The Board also notes that the Applicant has undertaken to file with the Board a list of such approvals and the conditions governing the purchase of electricity under such approvals.

In addition to the above requirement for approval of agreements, the Applicant has indicated that it has submitted its 25 Year Demand/Supply Plan Report to the Ontario EAB for review under the provincial *Environmental Assessment Act*. That review relates to the requirement and rationale for additional facilities needed to meet Ontario's future electricity requirements. In this regard, the Board does not agree with the Applicant's stated view that the results of this review will not provide any additional information to the Board because generation is not being built or advanced for export. In the Board's view the types and relative sizes of additional facilities to be constructed during the export period can have a significant impact on the supply of the proposed export under Part 1 of the application, namely the export of interruptible energy over a 15-year term. This is because the types and sizes of future facilities will affect how existing facilities are operated and will have a bearing on whether the established environmental limitations, applicable to generation for both export and domestic purposes, can continue to be met throughout the proposed export period.

The Demand/Supply Plan Report indicates that Ontario Hydro will need to have some additional major system facilities built and in-service during the latter part of the proposed export period. Without at least a general knowledge of the types and sizes of facilities planned to be constructed over that period, the Board believes that it does not have before it the best information on which to decide on the full 15-year term requested under Part 1 of the application. For the Board to be in a position to

assess the implications of the requested 15-year term, it would require more information on the environmental effects of the selected future facilities than is presently available. It is doubtful that such information could be obtained before the completion of the Ontario EAB review and, if it could, the process of obtaining such information would undoubtedly involve a considerable duplication of those on-going provincial review measures. For those reasons the Board believes that it would be preferable not to take a decision on the whole period of the requested export authorization under Part 1 of the application at this time.

Notwithstanding the above view, based on the information that has been provided by Ontario Hydro, the Board believes that at this time it can make an assessment of that export during the early portion of the proposed export period, during which time the facilities under consideration will not be involved.

The information provided by Ontario Hydro clearly demonstrates that no major new facilities, other than those provided for in the context of the utilities current expansion plan, i.e., the completion of the Darlington nuclear generating station, are required before the year 1993 or 1994. The Board is also confident that the Ontario EAB review will have been completed within that time span. It therefore has decided to examine Part 1 of the Applicant's request only for the period commencing 1 July 1991 to 30 June 1994.

6.3 Examination of Part 1 of the Application

6.3.1 Environmental Impact

With respect to the Applicant's nuclear generation, the Board accepts that the plants would be operated at the same output levels to supply other loads if no exports were to take place. Consequently, radioactive emissions and radioactive wastes would occur at the same level with or without the proposed exports. The Board notes that electricity production from nuclear generating plants and, in particular, the Darlington plant, including any portion that might be used in the supply of the proposed export, is subject to stringent emissions controls by the Atomic Energy Control Board. In this regard, the Board also notes the Applicant's intention to control radioactive emissions to within 1% of the regulated limits.

The fact that in the near term the only major facilities to be added to the Applicant's power system comprise the Darlington nuclear facilities indicates that during this period less fossil-fired generation will be needed to meet domestic requirements. This means that during this period Ontario Hydro's ability to comply with provincially-regulated acid gas emission limits will be increased. Considering this fact and based on its examination of the Applicant's acid gas abatement program, the Board is satisfied that, during the first three years of the proposed export period, total acid gas emissions by Ontario Hydro would likely remain below the allotted annual limits of 280 Gg for 1991, 1992 and 1993 and 215 Gg for 1994 and beyond.

Furthermore, in considering the effect of the proposed export on air quality, the Board notes that the electricity proposed for export would replace electricity that would otherwise be, for the most part, produced by fossil-fired generation in the United States with similar impact. The Board is therefore of the view that the net environmental impact of increased SO₂ emissions and the related social effects

from the generation of the electricity for the proposed export would be insignificant or mitigable with known technology.

Ontario Hydro has provided information demonstrating that up to 9 TW.h of exports would be supplied by fossil-fired generation without exceeding the regulated acid gas emission limits. For this reason, while the Board would be prepared to authorize a total annual quantity of 15 TW.h of exports in respect of Part 1 of the application, it would also include a condition in any permit it might issue to restrict the maximum annual authorized quantity of exports supplied from fossil-fired generation to somewhat less than that quantity. Including a small margin to account for load forecast uncertainty, the Board believes that an authorized quantity of up to 10 TW.h to be supplied by fossil-fired generation is reasonable.

The Board agrees with Ontario Hydro that there would not be any incremental environmental impact from the continued use of the portion of Ontario Hydro's transmission system and the international power lines and the U.S. power lines which would be involved in transmitting the electricity proposed to be exported under Part 1 of the application.

Regarding the impact of the proposed export on global warming, the Board notes Ontario Hydro's position that there will be no net increase in CO₂ emissions resulting from burning fossil fuel in Ontario for export. Indeed, to the extent that exports are sourced from nuclear or hydraulic energy the Board believes that the net effect of the proposed export on global warming would be favourable, and, in particular, would contribute towards stabilization of CO₂ emission levels in keeping with recently proposed Canadian government environmental objectives.

On the basis of its assessment of the impact of the export under Part 1 of the application during the first three years of the proposed export period, as required under the provisions of the Act, and the results of environmental screening of the export proposal, and, subject to the condition described in Section 6.5 relating to any permit that the Board may issue, the Board finds that any potentially adverse environmental effects, including any social effects directly related to these environmental effects, in respect of nuclear generation would be mitigated with known technology to within prescribed regulatory standards. The effectiveness of Ontario Hydro's mitigative measures would be assured through monitoring and enforcement of regulations of the Atomic Energy Control Board. With respect to the electricity for export which would be generated at thermal plants, the Board also concludes that any potentially adverse environmental effects, and directly related social effects, would be mitigable to within prescribed standards with known technology.

6.3.2 Effect on Other Provinces

The proposed export under Part 1 of this Application could, in theory, affect neighbouring provinces in two ways. It could affect the reliability and security of the operation of their power systems. Moreover, air pollutants resulting from the generation of the electricity for export could be transported across provincial boundaries with resultant environmental impact.

The Board notes that Ontario Hydro stated that it complies with all safety and reliability standards of the Northeast Power Coordinating Council. The Board also notes that the proposed export involves the continuation of transactions similar to those previously authorized. Since similar types of transactions have been taking place for a number of years without adverse effects on the adjacent power systems, the Board is satisfied that the proposed exports would not affect the reliability or

security of those systems. Furthermore, the Board notes that no objections to the application were received from neighbouring provincial utilities on that ground.

With respect to the potential environmental impact on neighbouring systems the Board notes that information provided by Ontario Hydro indicated that the environmental impact of the proposed export outside of Ontario would be similar to or somewhat less than the impact that would result if the export was not authorized. Based on that information the Board is of the view that the proposed export has no net effect on the environment of neighbouring provinces.

6.3.3 Fair Market Access

Fair market access is meant to afford to Canadian purchasers who have demonstrated an intention to buy electricity for consumption in Canada an opportunity to purchase electricity on terms and conditions as favourable as those offered to an export customer.

With regard to the proposed export under Part 1 of the application, the Board notes that it is Ontario Hydro's stated position, in compliance with the fair market access criteria, to continue to offer all interruptible exports to neighbouring Canadian utilities and to grant interception rights to those utilities. The Board also notes that all the neighbouring Canadian utilities have indicated their general concurrence with the procedure proposed by Ontario Hydro.

The Board accepts the Applicant's approach to compliance with fair market access and will ensure that any permit it may issue in respect of exports of interruptible energy will require Ontario Hydro to continue to provide fair market access.

6.4 Examination of Parts 2 to 5 of the Application

6.4.1 Environmental Impact

With respect to the environmental impact of the proposed export under Part 2 of the application, circulating power flows, there is no net generation associated with such flows. Furthermore, such flows would normally be controlled to prevent the normal operating limits of the interconnected transmission system from being exceeded. For these reasons the possible environmental impacts of such flows are insignificant. The Board also considers that the environmental impact of the border accommodation transfers, i.e., the proposed exports under Parts 4 and 5 of the application, is insignificant because of the small quantities of electricity involved.

With respect to the proposed export of firm power to Vermont, under Part 3 of the application, the Board notes that the electricity to be exported was previously approved as part of the 1200 MW of firm exports allowed under licence EL-135.

The continuation of that export over an additional 16-month period will not entail the addition of new facilities, nor will it create any new incremental effects. Indeed, the incremental effects arising from the generation needed to supply that export can be considered to be insignificant compared to the effects arising from supplying the total system requirements. Furthermore, it is unlikely that the Applicant's emission limit margin would be jeopardized by the supply of that export because it would take place in the near term, during a period when the Applicants nuclear supply capability is

expanding but no other facilities are being constructed to supply the domestic requirements. For those reasons the Board considers that the environmental impact of that export is insignificant.

6.4.2 Effect on Other Provinces

For the same reasons as are discussed in Section 6.3, Examination of Part 1 of the Application, the Board is satisfied that there would be no reliability or security problems for neighbouring systems associated with the continuation of exports as requested under Parts 2 to 5 of the application.

With respect to the potential environmental impact on neighbouring provinces the Board concurs with the Applicant's conclusions that the impact would be negligible.

6.4.3 Fair Market Access

The Board is of the view that fair market access is not applicable to Parts 2, 4 and 5 of the application. Since there is no net export involved under Part 2 of the application, circulating power flows, and since such flows are a consequence of interconnected system operations, fair market access does not apply. Also, the Board concurs with Ontario Hydro that it is not appropriate to require fair market access in respect of exports that are considered to be border accommodation transfers¹, such as the proposed exports provided for under Parts 4 and 5 of the application.

With respect to Part 3 of the application, the continuation under an existing contract of the export of firm power and energy to Vermont, the Board considers that Ontario Hydro has provided fair market access through the prior use of the first offer mechanism and by keeping neighbouring utilities informed of its export intentions.

6.5 Federal Environmental Requirements

The Board accepts that Ontario Hydro's system for monitoring and controlling plant emissions is capable of ensuring that ground level concentrations of pollutants meet all applicable federal guidelines and regulations. However, to assure itself that Ontario Hydro will continue to meet federal requirements, the Board will condition any permit it may issue so that the generation of electricity for the proposed exports shall not contravene applicable federal environmental standards and guidelines.

¹ A border accommodation transfer means a power or energy transfer for purposes of providing electricity service to a customer in a foreign country who lacks access to services from an electric utility of that country.

Chapter 7

Disposition

After considering the information provided by the Applicant and the interventions and submissions of interested parties, the Board decided to avoid duplication of provincial environmental review measures by restricting its assessment of the export permit term to the first three years of the term requested under Part 1 of the application. With that in mind, the Board is of the view that a public hearing in respect of the exports occurring during the first three years of the proposed export term pursuant to Part 1 of the application and in regard to those exports pursuant to Parts 2 to 5 of the application is not required or necessary. For these reasons the Board has decided not to recommend to the Minister that the Governor in Council designate Ontario Hydro's application for licensing.

In regard to the exports occurring during the first three years of the proposed export term pursuant to Part 1 of the application and in regard to those exports pursuant to Parts 2 to 5 of the application, the Board, having satisfied itself that their effect on provinces other than Ontario would be negligible, that the impact of those exports on the environment would be mitigable with known technology, that the Applicant has provided, where applicable, fair market access to the exports, and having had regard to all considerations that appear to it to be relevant, is prepared to issue to Ontario Hydro permits granting the requested authorizations. Terms and conditions applicable to each permit are set out in Appendices II through VI. In addition to meeting these terms and conditions, Ontario Hydro is required, in accordance with Section 18 of the National Energy Board Part VI Regulations, to supply to the Board, no later than the 15th day after the end of each month during the term of these permits, a report setting forth the quantities of power and energy exported and the resulting revenue (except, in the case of the permit described in Appendix VI, this report is required to be submitted to the Board every 6 months).

In addition, in regard to the export pursuant to Part 4 of the application, the Board is prepared to revoke Order ELO-273. The terms and conditions applicable to the revocation order are set out in Appendix VII.

Following the completion of the provincial EAB review the Board would be prepared to consider an application for the extension of the authorization of the proposed export under Part 1 of the application for the full 15 year period as requested by the Applicant.

The foregoing constitutes our Reasons for Decision in the matter of the present applications of Ontario Hydro pursuant to Part VI of the *National Energy Board Act*.

R.B. Horner, Q.C.
Presiding Member

R. Priddle
Member

A. Côté-Verhaaf
Member

Ottawa, Canada
April 1991

Appendix I

Capability and Load of Export Customers

Table a1-1

ONTARIO HYDRO

CAPABILITY AND LOAD OF EXPORT CUSTOMERS

Export Customers	1990 Total Capability MW	SOURCE OF PRODUCTION					PEAK LOAD (MW)	
		Hydro	Nuclear	Coal	Oil/Gas	Other	Summer 1989	Winter 1989-90
New York Power Authority (NYPA)	6 852	62%	26%	-	12%	-	2 537	2 679
Niagara Mohawk Power Corporation	7 574*	12%	19%	23%	46%	-	5 801	6 326
The New York Power Pool	32 846	15%	15%	15%	42%	13%	25 390	23 003
The Consumers Power Company	6 547	16%	13%	44%	27%	-	5 753	5 052
The Detroit Edison Company	10 081	9%	10%	67%	14%	-	8 704	6 675
General Public Utilities (GPU)	9 023	3%	22%	-	6%	69%	7 711	7 339
Minnesota Power	1 570	7%	-	91%	2%	-	1 134	1 273
The Vermont Department of Public Service (VDPS)	783	19%	34%	13%	27%	7%	810	1 006

* Includes 1 960 MW of capability from firm contracts with NYPA and others

Appendix II

Terms and Conditions of Export Permit EPE-21

Sale, Equichange, Storage, Adjustment and Carrier Transfer of Interruptible Energy

1. The term of this permit commences on 1 July 1991 and shall end on 30 June 1994.
2. The class of transfer authorized hereunder shall be sale, equichange, storage, adjustment and carrier transfers of interruptible energy.
3. The energy to be exported hereunder shall be transmitted over any international power line for which the Board has issued a certificate of public convenience and necessity.
4.
 - (a) The quantity of energy that may be exported hereunder shall not exceed 15 000 GW.h in any consecutive 12-month period, less actual exports under Permit EPE-23.
 - (b) Notwithstanding Sub-Condition (a), Ontario Hydro shall not export hereunder more than 10 000 GW.h generated from fossil-fueled facilities in any consecutive 12-month period.
5. The exports made hereunder shall be in accordance with
 - (a) the Interconnection Agreement of November 1988 between Consumers Power Company, The Detroit Edison Company and Ontario Hydro; or
 - (b) the Interconnection Agreement of 1 November 1986 between Niagara Mohawk Power Corporation and Ontario Hydro; or
 - (c) the Memorandum of Understanding between the Power Authority of the State of New York, carrying on business under the name of New York Power Authority, and Ontario Hydro, compilation of July 1979; or
 - (d) the Interconnection Agreement between the New York Power Pool and Ontario Hydro, compilation of October 1979; or
 - (e) the Interconnection Agreement of 1 January 1982 between Minnesota Power and Light Company and Ontario Hydro; or
 - (f) the Purchase and Sale Agreement of 14 September 1988 between General Public Utilities Corporation and Ontario Hydro; or
 - (g) the Transactions Power and Energy Agreement of 19 April 1988 between the State of Vermont and Ontario Hydro.
6. Any amendment or addition to, or termination or substitution of, the agreements referred to in Condition 5 shall not be effective until approved by the Board.
7. Ontario Hydro shall not export energy hereunder without providing fair market access to the proposed exports, including any part thereof, to Canadian purchasers who have declared an interest in buying electricity for

consumption in Canada, on terms and conditions as favourable as the terms and conditions specified in the agreements referred to in Condition 5.

8. The generation of energy to be exported hereunder shall not contravene relevant federal environmental standards or guidelines.

NATIONAL ENERGY BOARD

Marie Tobin
Secretary

Appendix III

Terms and Conditions of Export Permit EPE-22

Circulating Power and Energy

1. The term of this permit commences on 1 January 1996 and shall end on 31 December 2025.
2. The class of transfer authorized hereunder shall be the transfer of unscheduled circulating power and energy for simultaneous return to Canada.
3. The power and energy to be exported hereunder shall be transmitted over any international power line for which the Board has issued a certificate of public convenience and necessity.
4. The quantity of energy that may be exported hereunder shall not exceed 10 000 GW.h in any consecutive 12-month period.
5. The generation of energy to be exported hereunder shall not contravene relevant federal environmental standards or guidelines.

Appendix IV

Terms and Conditions of Export Permit EPE-23

Sale Transfer of Firm Power and Energy

1. The term of this permit commences on 1 July 1991 and shall end on 31 October 1992.
2. The class of transfer authorized hereunder shall be the sale transfer of firm power and energy.
3. The power and energy to be exported hereunder shall be transmitted over any international power line for which the Board has issued a certificate of public convenience and necessity.
4. The quantity of power that may be exported hereunder shall not exceed 112 MW.
5. The quantity of energy that may be exported hereunder shall not exceed 1320 GW.h during the entire term of this permit.
6. The exports made hereunder shall be in accordance with the agreement between the State of Vermont and Ontario Hydro dated 26 October 1987.
7. Any amendment or addition to, or termination or substitution of, the agreement referred to in Condition 6 shall not be effective until approved by the Board.
8. The generation of energy to be exported hereunder shall not contravene relevant federal environmental standards or guidelines.

NATIONAL ENERGY BOARD

Marie Tobin
Secretary

Appendix V

Terms and Conditions of Export Permit EPE-24

Border Accommodation Sale Transfer of Firm Power and Energy

1. The term of this permit commences on 1 July 1991 and shall end on 30 June 2021.
2. The class of transfer authorized hereunder shall be the sale transfer of firm power and energy as a border accommodation.
3. The power and energy to be exported hereunder shall be transmitted over the international power line authorized by Certificates of Public Convenience and Necessity Nos. EC-19 and EC-20.
4. The quantity of power that may be exported hereunder shall not exceed 3 MW.
5. The quantity of energy that may be exported hereunder shall not exceed 15 GW.h in any consecutive 12-month period.
6. The exports made hereunder shall be in accordance with the Memorandum of Understanding between the Power Authority of the State of New York, carrying on business under the name of New York Power Authority and Ontario Hydro dated 17 October 1961.
7. Any amendment or addition to, or termination or substitution of, the agreement referred to in Condition 6 shall not be effective until approved by the Board.
8. The generation of energy to be exported hereunder shall not contravene relevant federal environment standards or guidelines.

NATIONAL ENERGY BOARD

Marie Tobin
Secretary

Appendix VI

Terms and Conditions of Export Permit EPE-25

Border Accommodation Sale Transfer of Firm Power and Energy

1. The term of this permit commences on 15 May 1991 and shall end on 14 May 2021.
2. The class of transfer authorized hereunder shall be the sale transfer of firm power and energy as a border accommodation.
3. The power and energy to be exported hereunder shall be transmitted over the international power line authorized by Board Exemption Order XE-2-72.
4. The quantity of power that may be exported hereunder shall not exceed 100 kW.
5. The quantity of energy that may be exported hereunder shall not exceed 200 MW.h in any consecutive 12-month period.
6. The generation of energy to be exported hereunder shall not contravene relevant federal environmental standards or guidelines.

NATIONAL ENERGY BOARD

Marie Tobin
Secretary

Appendix VII

Terms and Conditions of Revocation Order RO-ELO-273

IN THE MATTER OF section 21 of the *National Energy Board Act*; and

IN THE MATTER OF an application by Ontario Hydro for Authorization to export electricity, filed with the National Energy Board ("the Board") under file No 6200-O001-4;

BEFORE the Board on 24 April 1991;

WHEREAS in Part 4 of an application dated 10 October 1990, Ontario Hydro has requested an authorization to export firm power and energy to the Power Authority of the State of New York as a matter of border accommodation to supply the Iroquois Control Dam;

AND WHEREAS Ontario Hydro requested such authorization for a thirty-year period as of 1 July 1991;

AND WHEREAS Ontario Hydro currently holds export Order ELO-273 which expires 31 March 1993, for the same border accommodation service to the Iroquois Control Dam;

AND WHEREAS Ontario Hydro, in Part 4 of the application, has requested that export Order ELO-273 be revoked;

IT IS ORDERED that export Order ELO-273 be revoked as of 1 July 1991, the effective date of permit EPE-24.

NATIONAL ENERGY BOARD

Marie Tobin
Secretary