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2003/60 (b)



## BACKGROUND

### ELECTRICITY IN CANADA

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#### Overview

Canada is the world's sixth largest producer of electricity, and the largest producer of hydroelectric power. Canada also has one of the most diversified bases of electricity generation in the world. Sources include hydroelectricity, natural gas, oil, coal, nuclear power and, increasingly, renewable energy.

Canada's electric power industry is made up of provincial Crown corporations, investor-owned utilities and municipal utilities. There are also industrial establishments that produce electricity for their own use, and non-utility generators that sell electricity to the grid. The power grid is a network of power plants, substations and transmission lines that crosses borders.

Canada's provinces have jurisdiction over electric power utilities, most of which are connected both inter-provincially and internationally. That being said, the Government of Canada is involved in electricity issues when transmission lines cross international borders and may be involved when interprovincial borders are crossed. For example, the construction of international power lines requires the approval of the National Energy Board, an independent federal tribunal that reports to Parliament through the Minister of Natural Resources Canada.

Energy boards and governments in each of the provinces are responsible for establishing rules governing energy in their jurisdiction. For example, the Ontario Energy Board works closely with the Independent Market Operator (IMO) and other Canadian and U.S. agencies to regulate Ontario's market. It establishes and enforces rules for fair and transparent treatment of power generation, transmission and distribution companies.

The Canadian Nuclear Safety Commission is responsible for the safe operation of nuclear stations in Canada. It establishes and enforces the rules of operation, and monitors and approves commissioning of nuclear units.

#### The Grid

Most provinces are part of an interconnected electricity "grid," a network of power plants, substations and transmission lines that crosses borders.

This grid serves two purposes. First, it enhances the stability of the system. For example, if one utility experiences power demands it cannot supply immediately, other utilities can help meet these demands until the first system can get its reserve generation on line. And second, it allows utilities to sell power to each others, thereby reducing generation costs.

The majority of northeastern provinces and states — including Ontario, New York and Michigan — are part of the section known as the Eastern Interconnection. B.C. and Alberta, along with the western United States,

belong to the Western Interconnection. Newfoundland is not part of the grid, although Labrador, through Quebec is part of the grid. Quebec's connection with the grid is primarily through direct current lines.

Sharing electricity supplies north-south has historically been more prevalent, economical and effective than east-west transmission. Canada is as a whole energy-rich, and many provinces export some of the electricity they produce to the United States. This is particularly the case for Quebec, Manitoba and British Columbia.

The reliability of the interconnected grid is managed by the North American Electric Reliability Council (NERC). Established in 1968 following the major blackout in the northeastern United States and Canada in 1965, this body promotes the reliability of the electricity supply for North America. It sets standards for the operation of the grid, trains operators, investigates power disturbances, and makes recommendations to improve reliability. All major Canadian utilities interconnected to the North American grid are members of and participate in NERC. As part of the lessons learned from this blackout, failsafes were put in place to isolate sections of the grid from one another. In the case of August 14, 2003, those failsafes did not fully protect Canada. A Joint Canada-U.S. Task Force has been struck to consider what happened and provide recommendations for the future.

### **Interprovincial Connections**

Most provinces are interconnected with their immediate neighbours, allowing them to import and export power. East-west transmission is less common than north-south transmission, but a study is under way to examine the feasibility of such lines. Possible lines include those between Manitoba and Ontario, and Ontario and Quebec.

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Last Updated: 2003-08-29

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