

Department of Natural Resources**The Lower Churchill Project****Description:**

The Lower Churchill Project consists of two of the best undeveloped hydroelectric sites in North America: Gull Island, located 225 kilometers downstream from the existing Churchill Falls Generating Station; and Muskrat Falls, located 60 kilometers downstream from Gull Island. The 2,000-megawatt project at Gull Island has the potential to produce an average of 11.9 terawatt hours of energy annually. The 824 megawatt project at Muskrat Falls has the potential to produce an average of 4.8 terawatt hours a year. The project consists of both of the hydroelectric generating facilities and interconnecting transmission lines to the existing Labrador grid.

Gull Island

The Gull Island facility will consist of a generating station and will include:

- a dam 99 m high and 1,315 m long; and
- a reservoir 200 km² at an assumed full supply level of 125 m above sea level.

The dam will be a central till-cored, rock-fill, zone embankment. The reservoir will be 225 km long, and the area of flooded land will be 85 km² at full supply level. The powerhouse will contain four to six Francis turbines.

Muskrat Falls

The Muskrat Falls facility will consist of a generating station and will include:

- a concrete dam with two sections on the north and south abutments of the river; and
- a 107 km² reservoir at an assumed full supply level of 39 m above sea level.

The north section dam will be 32 m high and 180 m long, while the south section will be 29 m high and 370 m long. The north section will serve as a spillway in extreme precipitation events. The reservoir will be 60 km long and the area of flooded land will be 36 km² at full supply level. The powerhouse will contain four to five Propeller or Kaplan turbines, or a combination of both.

Transmission

The interconnecting transmission lines will consist of:

- a 735 kV transmission line between Gull Island and Churchill Falls; and
- two 230 kV transmission lines between Muskrat Falls and Gull Island.

The location of the transmission lines will be north of the Churchill River; the final route is the subject of a route selection study included in the environmental assessment. The lines between Muskrat Falls and Gull Island may be on separate towers, or combined on double-circuit structures.

Background:

The Churchill River in Labrador is a significant source of renewable, clean electrical energy; however, the potential of this river has yet to be fully developed. The existing 5,428 megawatt Churchill Falls generating station, which began producing power in 1971, harnesses about 65 per cent of the potential generating capacity of the river. The remaining 35 per cent is located at two sites on the lower Churchill River, known as the Lower Churchill Project.

The Lower Churchill Project consists of two hydroelectric sites: Gull Island and Muskrat Falls. Combined, the projects can produce sufficient energy to supply up to 1.5 million households annually and contribute significantly to the reduction of air emissions from power generation; in particular the projects would displace an estimated 16 megatonnes of carbon dioxide emissions annually from comparable production from coal thermal generation. Combined with the existing Churchill Falls Generating Station, the three developments could produce the electrical equivalent of 225,000 barrels of oil a day -forever.

The timing is favourable for this development and in keeping with the agenda of developing resources for the maximum benefit of the people of the province; the Government of Newfoundland and Labrador announced on May 8, 2006 that Newfoundland and Labrador Hydro (Hydro), a crown corporation, will be the lead for the development of the Lower Churchill Project.

Currently, the Lower Churchill Project team is vigorously pursuing the project development on multiple fronts. A comprehensive planning schedule is in place leading to project sanction in 2009 with first power by 2015. Like any development project of this magnitude, there are many components being addressed – these include preparation for the environmental assessment process; analysis of market access options and market destinations; development of a financing strategy; negotiations for an Impacts and Benefits Agreement with the Innu Nation of Labrador; review of previous engineering design work and preparation for further studies and field work; and determination of the optimum project configuration.

Depending on the development option chosen, the development of the two sites is valued between \$6-9 billion.

Current Status:

Hydro is now laying the groundwork for an extensive environmental assessment process and on December 1, 2006 the company registered the Lower Churchill Project with the required federal and provincial environmental regulatory agencies. In February 2007, the federal government announced that the Department of Fisheries and Oceans (DFO) and Transport Canada (TC) were the Responsible Authorities (RA) for the EA and on June 5 the federal Minister of Environment announced his decision to refer the Project to a Review Panel.

The field work on several environmental studies has been completed and more work is now underway. This will be followed by a considerable amount of consultation on the project – leading to the filing of the full Environmental Impact Statement (EIS).

Furthermore, work continues on market destinations and market access options. Hydro is of the view that a variety of market opportunities do exist including Ontario, Quebec, the Maritime Provinces and the northeast United States and the province signed a Memorandum of Understanding with the State of Rhode Island in June 2007 to begin exploring the potential of exporting 200 MW of Lower Churchill power to that area. With respect to market access options, several remain under consideration including the Maritime submarine route and transmission through Hydro-Quebec's transmission system. To this end, in 2006 Hydro applied for transmission services in Quebec and Ontario to transmit lower Churchill power from the Labrador/Quebec border to markets in both provinces, as well as the Maritime Provinces and the northeast United States.

As part of the analysis of the sub-sea cable option, Hydro filed an application for long-term transmission service from the New Brunswick System Operator (NBSO) on February 6, 2007. All of these requests will result in studies that will provide an understanding of the costs and technical considerations of getting lower Churchill power to market. These studies will continue throughout 2007.

Critical Time Lines:

In order to meet the Project's committed sanction date of 2009, numerous achievements need to be reached across all disciplines; however the area of planning that could impact on the project timelines the most is the Environmental Assessment Process. The federal and provincial EA authorities have a considerable amount of work to conclude in order to get the joint EA process developed. If negotiations to develop a Memorandum of Understanding (MOU), consultation with aboriginal groups, the appointment of a Review Panel and a Panel secretariat, and the finalization of EIS Guidelines are protracted, it could delay Hydro's submission of the Environmental Impact Statement which would impact on the overall project schedule.

Action Required:

The provincial and federal governments must decide on definitive process that will expedite the signing of the MOU, consultation with aboriginal groups and the release of the guidelines.

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